CAPITAL AREA REGIONAL PLANNING COMMISSION

210 Martin Luther King Jr. Blvd. Room 362 Madison, WI 53703 Phone: 608-266-4137 Fax: 608-266-9117 www.CapitalAreaRPC.org info@CapitalAreaRPC.org

CARPC Resolution No. 2017-02

Recommending to the WDNR Amendment of the *Dane County Water Quality Plan* by Adopting the Update of Appendix G: *Dane County Groundwater Protection Planning Framework*

WHEREAS, In March 1975, Dane County was designated by the Governor of Wisconsin as an area having substantial and complex water quality control problems, and certified such designation to the federal Environmental Protection Agency; and

WHEREAS, the Capital Area Regional Planning Commission is a duly created regional planning commission under Wis. Stats. § 66.0309; and

WHEREAS, the CARPC has an agreement with the Wisconsin Department of Natural Resources (WDNR) to provide water quality management planning assistance to the WDNR; and

WHEREAS, the *Dane County Water Quality Plan* is the approved areawide water quality management plan for the Dane County region; and

WHEREAS, the Capital Area Regional Planning Commission has adopted, reaffirmed, and recommended amendment of the *Dane County Water Quality Plan*; and

WHEREAS, the Capital Area Regional Planning Commission has prepared an updated Appendix G to the *Dane County Water Quality Plan*, entitled "*Dane County Groundwater Protection Planning Framework*," and has made the document available to all local units of government in Dane County; and

WHEREAS, the public hearing was deferred during the Regional Planning Commission meeting on August 11, 2016, to allow more time for public comment on the Appendix; and

WHEREAS, a public hearing was held during the Regional Planning Commission meeting on January 12, 2017, to take testimony on the Appendix including revisions to the report based on public comments received.

NOW, THEREFORE, BE IT RESOLVED that in accordance with Wis. Stats. § 66.0309, and Sec. 208 of Public Law 92–500, the Capital Area Regional Planning Commission recommends the amendment of the *Dane County Water Quality Plan* by adopting the updated Appendix G: *Dane County Groundwater Protection Planning Framework*.

January 12, 2017
Date Adopted

Larry Palm, Chairperson

Kris Hampton, Secretary

Meeting Registration
Capital Area Regional Planning Commission

PLEASE NOTE: Public comment will be heard during the "Public Comment" agenda item, unless the comment is for a Public Hearing. Registrants are allowed three (3) minutes to comment.

Name and Title of Registrant: CHAD LAWCER, DIR. GOVT AFFAIRS

Date: 1/12/17

Representing: MADISON AREA BUILDERS ASSO

Address: 5936 SERVICE CENTRE CT MADISON WI 53717

I SUPPORT Agenda Item Numbers(s): ~~17~~ 14 ✓

And ☒ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

I OPPOSE Agenda Item Numbers(s): _____

And ☐ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

I AM NEUTRAL on Agenda Item Numbers(s): _____

And ☐ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

Comments

Meeting Registration
Capital Area Regional Planning Commission

PLEASE NOTE: Public comment will be heard during the "Public Comment" agenda item, unless the comment is for a Public Hearing. Registrants are allowed three (3) minutes to comment.

Name and Title of Registrant: Robert Procter

Date: 1-11

Representing: Realtors Assoc. of South Central WI

Address: 2 E Mifflin # 200 MAD WI

I SUPPORT Agenda Item Numbers(s): 14 ✓

And ☒ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

I OPPOSE Agenda Item Numbers(s): _____

And ☐ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

I AM NEUTRAL on Agenda Item Numbers(s): _____

And ☐ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

Comments

Meeting Registration
Capital Area Regional Planning Commission

PLEASE NOTE: Public comment will be heard during the "Public Comment" agenda item, unless the comment is for a Public Hearing. Registrants are allowed three (3) minutes to comment.

Name and Title of Registrant	Date
Tim Roehl	12.12.17
Representing	**Address**
DCTA & Realtors SCW	7246 Valley View Varona, UT

I SUPPORT Agenda Item Numbers(s): ~~Appendix G~~ (14) ✓

And ☑ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

I OPPOSE Agenda Item Numbers(s): _____

And ☐ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

I AM NEUTRAL on Agenda Item Numbers(s): _____

And ☐ I wish to speak
☐ I do NOT wish to speak
☐ Available for Questions

Comments

- Increase County and UW-Extension training and education for farmers, landowners, and commercial applicators on pesticide use and fertilizer application by the use of integrated pesticide management and nutrient management planning;

- Consider providing an expanded role for the Department of Health – Madison and Dane County in the approval of septage land disposal sites;

- Reduce the use of road salt by local units of government, homeowners, motorists, and commercial applicators in part through the Wisconsin SaltWise Partnership;

- Support an ongoing proactive and collaborative regional groundwater planning and management framework among Dane County communities to address water availability and sustainability issues.

  More specifically, CARPC recommends that its staff:

  a. Support the conduct of water supply service area planning required by Wis. Stats. 281.348 and also comprehensive (master) planning under Wis. Stats. 66.0309(9).

  b. Assist municipalities and resource management agencies incorporate and utilize the information, tools, and guidelines in this planning framework to develop processes and standards to address potential groundwater impacts. ~~in decisions involving land use, site approvals, or permits that may impact groundwater.~~Decision areas may include but are not limited to well proposals; WPDES permits discharging to groundwater, biosolids and septage land spreading sites; stormwater infiltration; sanitary landfills; large manure storage lagoons or feedlots; large unsewered subdivisions; prioritization of remediation sites and monitoring.

  c. Assist municipalities and resource management agencies provide public information, education, and technical resources to citizens and landowners concerning groundwater quality protection and management throughout the region.

Literature Review and Data Sources

This plan is based on available data on pollution sources, water quality and physical resource features. Existing data and literature were reviewed from numerous agency sources including the documents, publications and online materials from the Wisconsin Department of Natural Resources (WDNR), the Department of Agriculture, Trade and Consumer Protection (DATCP), and the Wisconsin Geological and Natural History Survey (WGNHS), as well as personal communications with state and local agency staff.

The most comprehensive reference regarding the groundwater resource in Dane County came from reports developed from the Dane County Regional Hydrologic Study. The interagency Dane County Regional Hydrologic Study, started in 1992 and completed in 1997, was conducted to provide information on the impact of urban development, well pumping and wastewater diversion on lakes, streams, wetlands and groundwater in Dane County. This work is part of ongoing collaborative work among the Capital Area Regional Planning Commission (RPC), the Wisconsin Department of Natural Resources (WDNR), the Wisconsin Geological and Natural History Survey (WGNHS), the U.S. Geological Survey (USGS), and other state and local governments. Information from the original model has been augmented with a more sophisticated and improved regional groundwater model coordinated and sponsored by CARPC and completed in 2014. This updated model builds on research and studies conducted since the original model was first developed in the 1990s.

Pursuant to Act 310, the GAC was terminated at the end of 2007 following submittal of its second report to the Legislature.

Great Lakes Compact, 2007 Wisconsin Act 227

The Great Lakes Compact took effect on December 8, 2008 after Wisconsin and the other Great Lakes states' ratification of the Compact and the U.S Congress' subsequent consent. The Compact addresses water quantity management in the Great Lakes – Saint Lawrence River Basin. It sets out requirements for Basin water uses in the areas of registration, reporting, management, and water conservation and efficiency. It also prohibits diversions of Basin water with limited exceptions for straddling communities and intra-basin transfers (from one Great Lake basin to another). Under the Compact, states are required to develop a program for managing Basin withdrawals from groundwater and surface water, that relies on a decision-making standard for new or increased withdrawals. States are also required to develop and implement a Basin water conservation and efficiency program.

Wisconsin's legislation implementing the Great Lakes Compact is extensive. Wisconsin Act 227 calls for statewide registration of existing and new water withdrawals with the capacity to withdraw more than 100,000 gallons per day averaged over 30 days. Withdrawals over 100,000 gallons per day averaged over 30 days must be reported annually (existing state statutes already require this reporting for groundwater withdrawals; however, most surface water withdrawals, other than municipal, were not reported prior to 2010). This requirement applies statewide. Initial withdrawal amounts from 2008 are the basis for determining if a proposed increase in a withdrawal exceeds the threshold for applying a decision-making standard. Act 227 directs that Basin withdrawals over 100,000 gallons per day averaged over 30 days require a permit.

Act 227 requires the WDNR to develop a statewide water resources inventory and publish a State Water Use Report every five years. Act 227 also requires that the WDNR develop and implement a water conservation and efficiency program with voluntary measures to apply across the state. Additional mandatory elements apply in the Great Lakes Basin, with the most stringent requirements for communities applying for diversions or water uses with high rates of water loss.

An additional element of the new legislation is the requirement for water supply service area plans. Act 227 requires all municipalities with water supply systems that supply more than 10,000 people to have an approved water supply plan by 2026. This planning process is modeled after the wastewater planning process and uses a cost-effectiveness analysis that assesses the environmental and economic impacts of alternatives in the plan to determine the approach that maximizes environmental benefits and minimizes total resource costs over the planning period.

~~**Lake Beulah Supreme Court Case**~~

~~In July 2011, the Wisconsin Supreme Court issued its decision in the case of Lake Beulah Management District v. State Department of Natural Resources. To briefly summarize, the Court reached the following conclusions:~~

~~The Court held that, pursuant to Wis. Stat.s 281 (water and sewage management) and the Legislature's delegation of the State's public trust duties, the WDNR has the authority and a general duty to consider whether a proposed high capacity well may harm waters of the state. Upon what evidence, and under what circumstances the WDNR's general duty is implicated by a proposed high capacity well is a highly fact-specific matter that depends upon what information is presented to the WDNR decision makers by the well owner in the well permit application, by citizens, and by other entities regarding that permit application while it is under review by the WDNR.~~

~~The Court further held that "to comply with this general duty, the WDNR must consider the environmental impact of a proposed high capacity well when presented with sufficient concrete, scientific evidence of potential harm to waters of the state. The WDNR should use both its expertise in water resources management and its discretion to determine whether its duty as trustee of public trust resources is implicated by a proposed high capacity well permit application, such that it must consider the environmental impact of the well or in some cases deny a permit application or include conditions in a well permit."~~

~~**Richfield Dairy Decision**~~

~~In September 2011, an Administrative Law Judge (ALJ) considered whether the WDNR is required to consider "cumulative impacts" when issuing approvals for high capacity wells. The ALJ determined that, despite the lack of any authority authorizing the WDNR to consider these cumulative impacts during the high capacity well approval process, there is "implied" statutory authority and that he *Lake Beulah* decision must be interpreted broadly to require WDNR to consider cumulative impacts.~~

High Capacity Wells

High capacity wells are regulated under s. 281.34, Wis. Stats, and are defined as "a well, except for a residential well or fire protection well, that, together with all other wells on the same property, except for residential wells and fire protection wells, has a capacity of more than 100,000 gallons per day." Any well, regardless of pump capacity, on a high capacity property is considered a high capacity well.[1] Section NR 812.09 Wis. Adm. Code requires prior DNR approval for the construction or reconstruction of a high capacity well. Technical review of high capacity wells is limited to what is described in state statutes and administrative codes. Two components are considered by DNR when reviewing a high capacity well application: construction and water withdrawal.

The proposed well construction is reviewed to ensure that it both meets the specifications of the well construction code (NR 812) and that the proposed well's construction does not contribute to, or worsen any groundwater contamination. Contaminants can be anthropogenic or naturally-occurring, and both are considered when reviewing well construction. For example, there are areas of Wisconsin that have naturally occurring arsenic in aquifer formations. Mobility of this arsenic may have been increased when pumping of large volumes of groundwater altered redox conditions of the aquifer from reducing to oxidized. In these areas applicants may be required to construct wells in such a manner that they do not draw water from formations or intervals that are known to contain arsenic bearing minerals. It is also important that wells be constructed with a good seal around the well casing. A proper seal prevents the well from becoming a pathway for contaminants to migrate from the surface or shallow subsurface to water supply aquifers below.

For the withdrawal portion of the review, the DNR changed its procedures in July 2011 in response to a 2011 Wisconsin Supreme Court decision[2] to review each application for a new high capacity well to determine whether the well, along with other high capacity wells on the contiguous property, would

[1] 2015 Wis Act 177 granted an exception for wells used for residential or fire protection purposes from being considered high capacity wells effective October 1, 2016. s. 281.34(1)(b) Wis. Stats.

[2] *Lake Beulah Management District v. Department of Natural Resources*, 2011 WI 54, 355 Wis. 2d 47, 799 N.W.2d 73. The Court held that, pursuant to Wis. Stat. § 281 and the Legislature's delegation of the State's public trust duties, the DNR has the authority and a general duty to consider whether a proposed high capacity well may harm waters of the state. Upon what evidence, and under what circumstances the DNR's general duty is implicated by a proposed high capacity well is a highly fact-specific matter that depends upon what information is presented to the DNR decision makers by the well owner in the well permit application, by citizens, and by other entities regarding that permit application while it is under review by the DNR.

result in significant adverse environmental impacts to waters of the state – which includes all streams, lakes, wetlands, public and private wells. Section NR 820.12(19), Wis. Adm. Code defines significant adverse environmental impact as:

> *Alteration of groundwater levels, groundwater discharge, surface water levels, surface water discharge, groundwater temperature, surface water temperature, groundwater chemistry, surface water chemistry, or other factors to the extent such alterations cause significant degradation of environmental quality including biological and ecological aspects of the affected water resource.*

If the DNR determined the proposed well could directly result in significant adverse environmental impacts, the DNR would either deny the well application or request that an applicant modify their proposed construction or operation of the well to prevent such impacts. DNR based the need to modify or deny an application on the projected impacts to the affected water resource, *e.g.*, estimated reductions in stream flow or lake level, and the resultant impacts to water temperature, the fishery and other ecological aspects of the stream or lake. In conducting these assessments, DNR considered site-specific hydrogeology, separation distance between the well(s) and the water resource, the hydrology and characteristics of potentially-affected surface waters, construction details of nearby wells, characteristics of the proposed wells such as construction, pump capacity, and the water use and pumping schedule for the proposed well and any other existing wells on the property. This version of the technical review methodology was in place from July 2011 through May 2016.

On May 10, 2016 Wisconsin's Attorney General issued a formal opinion (OAG-01-16) on the Department's review authority of high capacity well applications. Two key conclusions from the Attorney General's opinion are:[3]

- DNR may impose conditions or requirements on high capacity well approvals only if the agency has explicit permission or an explicit requirement to do so in statute or rule; and
- DNR does not have explicit authority to consider cumulative impacts or to impose monitoring requirements on high capacity well approvals.

As a result of the opinion, the DNR will review and condition high capacity wells using the same approach applied prior to the 2011 Lake Beulah Supreme Court decision. The DNR currently reviews each high capacity well application to determine whether the proposed high capacity well:

- is within a groundwater protection area (within 1,200 feet of a class 1, 2 or 3 trout stream or a designated outstanding or exceptional resource water);
- may impact springs with flow greater or equal to one cubic foot per second;
- will result in water loss greater than 95 percent;
- will result in 10 or more feet of water level drawdown in the public utility well based on 30 days of continuous pumping from the proposed high capacity well or well system; and
- will degrade safe drinking water and the groundwater resource or impact public safety.

The applications that meet the any of criteria listed above will be subject to an environmental review process and any approval will include conditions to ensure the well does not result in significant adverse environmental impacts and may require preparation of an environmental impact statement. In addition, if any of these conditions is met, the DNR may include specific conditions in the high capacity well approval, which may include conditions as to location, depth, pumping capacity, rate of flow and ultimate use.[3]

[3] http://dnr.wi.gov/topic/wells/highcapacity.html

State Agencies and Responsibilities

Department of Natural Resources

The WDNR has statutory authority to protect, maintain and improve the quality and management of the waters of the state, ground and surface, public and private (s. 281.11 Wis. Stats.). The WDNR establishes the groundwater quality standards for the state under authority of Chapter 160, Wis. Stats. In addition, the WDNR manages groundwater quantity under provisions of ss. 281.11, 12, 34, and 346, Wis. Stats. The WDNR programs that protect and manage groundwater are as follows:

Drinking Water and Groundwater (DG) – Regulates public water systems, private drinking water supply wells, well abandonment and high capacity wells. DG is responsible for adoption and implementation of groundwater standards contained in chapter NR 140, Wis. Adm. Code, and works closely with other programs and agencies to implement Chapter 160, Wis. Stats., including groundwater monitoring, database management, and staffing the Groundwater Coordinating Council. The provisions under 2003 Wisconsin Act 310 (codified at s. 281.34, Stats., and NR 820) and the Great Lakes Compact (2007 Wisconsin Act 227, codified at ss. 281.343 and 281.346, Stats.) are also being implemented by DG. The program also coordinates

Local Controls

Local units of government can voluntarily attempt to minimize the amount of salt applied to roadways. Many have evaluated and begun implementing various options to address this, such as purchasing new equipment (e.g., automated spreaders) and/or using alternative materials (e.g., sand).

Impact/Effectiveness

A survey of salt storage sites in the county revealed that most sites are protected by coverings and linings. Salt use is probably a greater threat to groundwater quality than salt storage in Dane County. Increasing chloride and sodium concentrations in Madison wells are associated with deicer use. Many communities have begun instituting salt reducing measures, but these do not appear to be keeping up with the increase in lane miles being traveled. Increasing salt concentrations in wells and surface water is cause for concern. Additional efforts are needed to reverse this disturbing trend, including support for additional research and demonstration projects to provide safe winter driving conditions while also reducing chloride and sodium application.

Stormwater Management

State Controls

Proper infiltration of stormwater has many benefits, including maintaining groundwater recharge and reducing stormwater runoff and pollutant loads. In order to ensure safe drinking water, contaminants must be removed from stormwater before it reaches groundwater aquifers. Although soil is a tremendous natural filter, it cannot treat contaminated stormwater runoff beyond its limits. Pretreatment practices have a wide range of removal rates for different contaminants. This why it is important to design and implement practices to remove pollutants that take into account the potential contaminants in stormwater, site specific conditions, and maintenance needs.

Under NR 151.124 and 151.244, a construction site landowner must meet the performance standard for infiltration of runoff taking into account site restrictions. A technical standard has been developed to assist site designers in the assessment of the site and its adequacy in providing infiltration that is both

protective of groundwater and practical to implement. The intent of the infiltration standard is to encourage infiltration of runoff. This requirement is tempered by a series of prohibitions and exemptions for the purpose of minimizing the risk of groundwater contamination and to address the practicality of implementation.

Local Controls

In 1989 the Legislature created the Dane County Lakes and Watershed Commission to serve as a coordinating and advisory agency for water quality issues within Dane County government (Wisconsin Act 324). Under the Act, the Commission may propose to the county board minimum standards for local regulations and ordinances for municipalities and the county to protect and rehabilitate the water quality of the surface waters and groundwater. In addition, CARPC provides review and approval of stormwater practices through its Urban Service Area amendment process. Dane County, local municipalities, and CARPC encourage and promote development practices that minimize surface water runoff and maximize infiltration and groundwater recharge. Several researchers have pointed out that stormwater infiltration practices that have been designed correctly pose little threat to the groundwater.

Impact/Effectiveness

With the emphasis on volume control BMPs in recent years, the issue of soil and groundwater contamination is gaining more attention. Recent research has improved the outlook on the risks of soil and groundwater contamination. Long-term (20 year or more) studies of groundwater below infiltration basins have shown no adverse effects from infiltrating stormwater.[4] Pretreatment of stormwater runoff from critical pollutant sources areas is required. The WDNR has developed program guidance and technical standards for best management practices for meeting the infiltration performance standard of NR 151.[5,6] By standard, no stormwater is infiltrated without treatment unless it is clean rooftop runoff. With the increased emphasis on infiltration, the potential for localized groundwater table rise or "mounding" should also be considered in planning extensive infiltration facilities.

Well Construction and Abandonment

State Controls

The operation and design of public water systems is regulated by the WDNR under Chapter NR 811. This chapter requires the proper abandonment of all unused or unsafe private wells within municipal water service areas. Well construction, siting and abandonment is further regulated by the WDNR (chapter NR 812). This code prohibits the use of any well for disposal of sewage or for surface discharge drainage. Drillers of potable wells and pump installers need to be licensed, and well construction reports must be sent to the WDNR. Chapter. NR 141 establishes standards for designing, installation, construction and abandonment of groundwater monitoring wells.

Local Controls

Chapter NR 845, Wis. Adm. Code, was developed to allow for county administration of the private well construction and abandonment program. Dane County ordinance Chap. 45 details the county well construction and abandonment code. Improperly abandoned wells represent a real threat to groundwater that can be removed at relatively low cost. PHMD typically issues 60 to 70 abandonment orders each year.

The City of Madison has a local ordinance (Madison General Ordinance Sec. 13.21) which addresses well abandonment and operation permits within the Madison Water Utility service area. The ordinance provides that all unused and unsafe wells be properly abandoned. Owners of all other wells are required to obtain an operating permit from the utility which requires the owner to show that the well meets code and produces safe water. Well operating permits must be renewed every five years.

Impact/Effectiveness

Abandoned or unused wells pose a great threat to the safety and quality of groundwater drinking water supplies. An unused well provides a direct path for contaminants and pollutants to the underground aquifers that supply working wells. The WDNR considers a well to be permanently abandoned when it has been completely filled and sealed by a licensed well driller or pump installer using materials and methods as prescribed in section NR 812.26 of the Wisconsin Administrative Code. This generally means that the pump and any piping inside of the well casing have been removed and the well has been filled from bottom to top with proper filling materials, such as cement grout, concrete grout, concrete, a clay/sand slurry mix or, in some cases, bentonite chips. Some unsafe or unused wells are identified through complaints and are required

[4] Emmons and Oliver Resources. 2012. *Update on the Science of Volume Control BMPs*.
[5] http://dnr.wi.gov/topic/Stormwater/standards/postconst_standards.html
[6] http://dnr.wi.gov/topic/stormwater/documents/InfiltrationPerformanceStandardGuidance.pdf

Unused wells are a direct line for contamination into clean ground water. The WDNR provides financial assistance for low income well owners to properly abandon unused private wells. The WDNR also provides Well Compensation grants for replacing, reconstructing or treating contaminated private water supplies that serve a residence or used for watering livestock. Well construction work must be done according to WDNR specifications and the contaminated well properly abandoned.

Groundwater Quantity

State Controls

The Groundwater Quantity Act (2003 Wisconsin Act 310) expanded the State's authority to consider environmental impacts resulting from certain high capacity wells. Under that law, proposed high capacity wells that are within 1200 feet of trout streams and other designated high quality waters, wells that could have significant impacts on a spring, and wells with a high water loss are subject to more rigorous evaluation. ~~Since the 2004 adoption of Act 310, the scope of the WDNR's review of proposed high capacity wells has expanded even more as a result of the July 2011 Wisconsin Supreme Court decision in the *Lake Beulah* case and a September 2014 administrative law decision in the *Richfield Dairy* case. When reviewing high capacity well applications, WDNR staff now consider impacts to all waters of the state including streams, lakes, wetlands, municipal wells and private wells, cumulative impacts of the proposed well along with other wells on the same property and water withdrawals on other nearby high capacity well properties. If significant impacts are predicted, the well application may be modified or the approval may be denied.~~

In terms of current administrative code, NR 860 and NR 820 establishes the process, requirements, and criteria for water use permitting. NR 856 establishes requirements for registering water withdrawals and accurate reporting to support management efforts. NR 852 establishes a statewide water conservation and efficiency program, specifying mandatory measures in the Great Lakes Basin. In other areas of the state, the regulation applies to wells that would result in an average water loss greater than 2,000,000 gals./day over a 30 day period (although, relatively few wells exceed this amount).

Wisconsin law also requires a statewide water supply service area planning process for public water supply systems (Wis. Stats. 281.348). This is being promulgated through proposed rule NR 854. This rule would apply to water supply systems that serve a population of 10,000 or more. These systems would be required to be covered by an approved water supply service area plan by December 31, 2025.

The goal of the planning process is to help sustainably manage the state's waters to provide an adequate quantity and quality of water to customers; to prepare for increasing demands on the state's groundwater and surface water resources; and to protect springs, streams, wetlands, and other natural features. The law requires that communities assess the quantity and quality of available water supply through a practical planning process to ensure dependable, safe, and cost-effective water delivery to customers. Since groundwater doesn't recognize municipal boundaries, a regional planning process is the best approach to addressing water demand issues associated with urban development. Some municipalities in Dane County, in collaboration with the Regional Planning Commission, WGNHS, and USGS, have begun this work on an ad hoc basis as outlined in this planning framework.

Local Controls

Local units of government in Dane County can voluntarily manage their water supplies to help minimize impacts to their environment and promote more sustainable water use. Significant collaborative efforts have been made among federal, state, and local entities to conduct groundwater modeling and planning activities in the region coordinated by CARPC. While much has been accomplished, more can be done in this regard.

Impact/Effectiveness

~~The WDNR has the "authority and general duty" to consider whether a proposed high capacity well may harm waters of the state.[7] The WDNR is also required to consider the cumulative impacts when deciding whether to approve, condition or deny high capacity well approvals.[8] The WDNR uses both its expertise in water resources management and its discretion to determine whether its duty as a trustee of the Public Trust resources is implicated by a proposed high capacity well permit application. The approvals are predicated on the facts and information presented to the WDNR by the well owner in the permit application, by citizens, and by other entities while the permit is under review.~~ In Dane County significant state-of-the-art scientific tools have been developed (presented in this report) that can help inform communities and aid the WDNR in its decisions and approvals. Furthermore, continued regional collaboration will be needed among municipalities to minimize and mitigate the impacts of high capacity well withdrawals on the region's ground and surface waters, and promote more sustainable plans and practices in the future. Therefore, cooperative groundwater management policy in the region should include:

- a regional/watershed approach
- up-to-date hydrologic science
- increased focus on addressing cumulative impacts
- opportunities for water conservation and reuse
- monitoring and reporting
- adequate funding
- widespread participation and collaborative support

Public Information and Education

A well-developed educational program concerning groundwater protection should continue to be pursued in Dane County. Only through an informed public will groundwater be adequately protected. Public education on the occurrence and movement of groundwater, potential pollution sources and groundwater protection strategies is necessary to maintain the high quality of groundwater in the county. Also, in many instances, public knowledge is imperative for complying with state and local regulatory programs pertaining to groundwater management.

Particular emphasis in groundwater educational programs should be placed on how land use activities affect drinking water quality. This is especially relevant in Dane County because all residents obtain their drinking water from groundwater supplies. If individuals understand that their drinking water supply may be at risk, they will probably be more inclined to prevent water pollution.
General as well as detailed groundwater educational programs should be promoted to the public. Various federal and state agencies have all developed general educational and resource materials that are available to Dane County residents. A good place to begin with groundwater education is in the school systems of the county, where environmental awareness may be instilled at an early age. The Groundwater Coordinating Council publishes the *Wisconsin Groundwater Education Resource Directory*, which is a compendium of the agencies, people and resource materials available for use in groundwater education.

In addition to general educational efforts, specific programs should be developed (or intensified) and targeted at groups that have a direct land use impact on groundwater. In many instances, this means the agricultural community. Thus, educational programs concerning agricultural best management practices should receive emphasis. Best management practices that minimize detrimental groundwater impacts include pest control strategies that limit pesticide use (e.g., crop rotation), proper pesticide container and

~~[7] Wisconsin Supreme Court *Lake Beulah* decision, July 2011 .~~
~~[8] Administrative Law Judge *Richfield Dairy* decision, September 2014.~~

Siting and Land Use Decisions Affecting Groundwater

Assessment of Conditions and Management Controls:

Sources of groundwater pollution are many and varied. Many activities that contribute to groundwater pollution are closely integrated into our economic and cultural way of life. The type, duration, and intensity of our use of the land will largely determine the risk posed to groundwater.

Thus, siting and land use decisions made by state agencies, and by county and local governments and private landowners, can have a significant effect on drinking water supplies. In addition, wellhead protection programs are an important approach to drinking water supply protection. Although these programs are being required by federal and state regulations, given the catastrophic impacts on a community resulting from contamination of their water supply, the costs of replacing a contaminated well, the near impossibility of cleaning up a contaminated aquifer, and the importance of citizen confidence in the safety of their drinking water, this preventive approach has been strongly supported by communities – basically giving them local control and responsibility for their drinking water supplies.

Some aspects of wellhead protection programs, such as protecting important recharge or source areas, may need to extend beyond municipal boundaries, and will therefore require intergovernmental cooperation. Communities may want to consider extraterritorial zoning, intergovernmental agreements, open space plans, etc. Such an approach can reduce the risk of drinking water contamination and may avoid future infrastructure costs such as new wells or treatment.

Much of the information and analytical capacity for incorporating groundwater protection concerns into land use planning and decision making processes exists (e.g., hydrogeologic model, contamination risk maps, guidelines and criteria in **Reference Table 20,** etc.). Greater efforts are needed to ensure that impacts on groundwater quality are routinely and adequately considered in siting and land use decisions.

Recommendations:

1. Local units of government and other responsible agencies, including the Regional Planning Commission should collaborate ~~include~~ to develop processes and standards for the evaluation of potential groundwater and hydrologic impacts. ~~Local units of government and other responsible agencies should seek CARPC staff participation, technical review and comment on land use proposals.~~

2. Local units of government ~~with land use authority~~ should assess, consider, and incorporate potential groundwater impacts and protections in the development and updates of local comprehensive and water supply plans. ~~Specific language should be added to county and municipal zoning and subdivision ordinances to require that groundwater protection receives adequate consideration and assessment during the review and approval process.~~ CARPC staff

can provide technical assistance in this regard.

3. Local units of government ~~with land use authority~~ should ~~be encouraged to~~ collaborate with the county and other responsible agencies to formally develop and incorporate groundwater impact assessment procedures and standards into their ~~land use decisions. In addition, municipalities should consider treating facilities with the potential to affect groundwater quality as conditional or prohibited uses in wellhead protection areas under a municipal~~ wellhead protection plans and ordinances. Also consider alternative options for plan implementation such as intergovernmental agreements and open space plans, CARPC staff can provide technical assistance in this regard.

Stormwater Infiltration

Assessment of Conditions and Management Controls:

Significant progress has been made in Dane County and around the state to reduce or mitigate the potential increase in flood peaks through stormwater volume control ordinances. Maintaining pre-development infiltration promotes additional benefits as well, including maintaining stream baseflow, water temperatures, and also water quality considerations (since pollutant loading is a function of runoff volume).

Both NR 151 and Dane County Chapter 14 require development projects to maintain some level of pre-development stay-on volumes. Dane County's ordinance (mirrored by other municipalities in the county) is more stringent, requiring 90 percent of pre-development stay-on for all development types. Additional requirements common to both regulations effectively protect groundwater quality. Municipalities should consider maintaining 100 percent pre-development stay-on volumes, where opportunities exist, as well as enhanced recharge above natural rates to help make up for well water withdrawals in a community.

Recommendations:

1. Stormwater Best Management Practice designers should consult state and local ordinances, ~~WDNR~~ technical standards, and current research, for design guidance and acceptability of infiltration practices and performance.

2. Municipalities should consider enhanced infiltration (above current levels) to help offset well water withdrawals in appropriate areas and where potential groundwater mounding/flooding will not negatively impact existing development or property.

3. Municipalities should actively encourage, promote, and track demonstration infiltration practices as part of current urban development in the region. Opportunities for public and private partnerships to undertake and assess new and innovative options for infiltration should be actively sought in partnership with CARPC. Practices such as porous pavement, roof gutters connected to infiltration trenches, and channeling of residual runoff to an infiltration pond could be installed and their effectiveness monitored.

Department of Safety and Professional Services

1. Consider and utilize the information, tools, criteria and guidelines identified in this plan in site approvals, or permits that could impact groundwater in Dane County. DSPS and other responsible agencies should seek CARPC staff participation, technical review and comment on proposed projects and locations.
2. Support and work with Dane County in implementing a program for tracking and ensuring that required inspection and maintenance is provided for all on-site wastewater systems in Dane County.
3. Increase support of monitoring and research directed at the groundwater impacts of on-site wastewater systems, and the development of practical and economical nitrogen-removing onsite systems.

Local Government

Dane County

1. Incorporate and utilize the information, tools, criteria and guidelines identified in this planning framework to develop processes and standards to address potential groundwater impacts. ~~in all land use decisions, site approvals, or permits that could impact groundwater.~~ Support and participate in the cooperative Regional Hydrologic Modeling and Management Program. Dane County should seek CARPC staff participation, technical review and comment on proposed projects and locations.
2. Assess, consider, and incorporate potential groundwater impacts and protections in the development and updates of local comprehensive plans. ~~Add specific language to the county zoning and subdivision ordinances to require that groundwater impacts and protection receive consideration and assessment during the review and decision-making process.~~ CARPC staff can provide technical assistance in this regard.
3. Work with WDNR, CARPC, and local units of government to develop effective wellhead protection programs and source protection plans for all municipal wells in Dane County, particularly where protection programs need to extend beyond local jurisdictional boundaries.
4. Maintain an inventory of livestock, feedlots, and manure storage facilities in Dane County.
5. Increase promotional and educational efforts directed at developing farm nutrient management plans and integrated pesticide management programs.
6. Continue implementation of the triennial inspection and required maintenance tracking system for all on-site wastewater systems in Dane County. Expand distribution of public informational materials on proper use and maintenance of on-site wastewater systems and private wells, including safe use and storage, collection and disposal of household hazardous materials and personal care products. Provide information, guidelines and contacts to rural homeowners for testing drinking water quality.
7. Continue to seek to assume responsibility for, or participate in, approval of septage landspreading sites.
8. Continue to expand and improve household hazard

6. Continue implementation of the triennial inspection and required maintenance tracking system for all on-site wastewater systems in Dane County. Expand distribution of public informational materials on proper use and maintenance of on-site wastewater systems and private wells, including safe use and storage, collection and disposal of household hazardous materials and personal care products. Provide information, guidelines and contacts to rural homeowners for testing drinking water quality.

7. Continue to seek to assume responsibility for, or participate in, approval of septage landspreading sites.

8. Continue to expand and improve household hazardous waste programs, and emergency response capability for hazardous material spills.

Cities, Villages, Towns, and Local Water Supply Agencies

1. Conduct water supply service area planning in the region as required by Wis. Stats. 281.348 with assistance provided by CARPC and in collaboration with local management agencies.

2. Incorporate and utilize the information, tools, criteria and guidelines identified in this planning framework to develop processes and standards to address potential groundwater impacts. ~~in all land use decisions, site approvals, or permits that could impact groundwater.~~ Support and participate in the cooperative Dane County Regional Hydrologic Modeling and Management Program. Municipalities and water supply agencies should seek CARPC staff participation, technical review and comment on proposed projects and locations.

3. Assess, consider, and incorporate potential groundwater impacts and protections in the development and updates of local comprehensive and water supply plans. ~~Add specific language to the local zoning and subdivision ordinances to require that groundwater impacts and protection receive consideration and assessment during the review and decision-making process.~~ CARPC staff can provide technical assistance in this regard.

4. Work with WDNR, Dane County and CARPC to develop effective wellhead protection programs and source protection plans for all municipal water supplies. Fix wells with faulty casing separating deep and shallow aquifers to help prevent downward movement of contaminants.

5. Work with DATCP and WDNR to expand monitoring and testing of older underground tanks in municipal well protection zones and areas of high or extreme contamination risk.

6. Continue and expand efforts to reduce the groundwater impacts of salt storage and use and snow removal practices.

7. Cooperate with WDNR and utilize the information and criteria in this plan and through the CARPC Regional Hydrologic Modeling and Management Program in locating and designing new high-capacity wells, in order to minimize adverse groundwater impacts.

8. Continue to work with WDNR, Dane County and CARPC to incorporate stormwater infiltration practices into local erosion/stormwater control ordinances that will protect groundwater.

Revisions in Response to DNR, Commissioner, and Public Comments Received

Table 30
Groundwater Protection Roles and Responsibilities

Potential Pollution Sources / Groundwater Management Controls		Regulatory						Non-Regulatory					Other				
		Permits	Site Approval	Land Use Controls	Construction Standards	Use Restrictions	Inspection & Testing	Guidelines/Criteria	Minimizing Input of Pollutants	Education	Voluntary BMP	Governmental Coordination	Training & Demonstration	Monitoring	Research & Inventory	Remedial Action	Emergency Response
Waste Disposal	Solid Waste Disposal Sites	S	S	L	S		SI	SI	L			SL		SI	SI	SL	
	Land Application of Wastewater	S	S		S		SL	S						SI	SI	L	
	Sanitary Sewers	S		SL	SL		S	S				SL				L	SL
	On-Site Wastewater Systems	SL	SL	sL	S		L	L		L		SL			SL		
	Sludge/Biosolids Application	S	S	S			S	S				SL		L	SL		
	Septage Applications	S(L)	S(L)	S(L)			S(L)	S(L)				SL			S(L)		
Agriculture	Manure Storage	L			SL			sL		sL	L				L		
	Fertilizer & Manure Spreading							sL		sL	L		SL				
	Pesticide Application					S		SL	L	SL	L		SL	S			
	Irrigation	S			S		S			sL	L						
Hazardous Materials	Household Hazardous Materials								L	sL							
	Above-ground Storage	S			S		L	S		SL		SL				SL	SL
	Underground Storage	S			S		SI	S		SL		SL		SL	S	SL	SL
	Transmission Pipelines	F			F		F	F								S	S
	Spills											SL	SL	SL	S	SL	SL
	Junkyards/Salvage Yards	L		L			L										
Other	Well Construction & Abandonment	SL	SL		SL		SL	S		SL		L			L		
	Salt Storage & Deicing					S	L	S	L	L	L	L			SL		
	Stormwater Infiltration	SL	sL		SL		L	SL		L	sL	L	SL		SL		
	Groundwater Quality and Quantity Management	SI	SI	L			S	sL		sL		SL		S	SL	FSL	

F = Federal Role
S = State Role
L = Local Role (including CARPC)
= Priority Action Needed

L or S = Primary Role
I or s = Assisting or Advisory Role
(L) = Possible Future Regulatory Program

Rupiper, Mike

From: Helmuth, Jeffrey A - DNR <Jeffrey.Helmuth@wisconsin.gov>
Sent: Monday, January 09, 2017 10:59 AM
To: Rupiper, Mike; Kakuska, Michael; Terrell, C - forward; Steinhoff, Stephen; Palm, Larry forward
Cc: Helmuth, Lisa D - DNR; Asplund, Tim - DNR; Freihoefer, Adam T - DNR
Subject: FW: Terrell request to Rupiper correcting redline of App. G Groundwater
Attachments: DNR_Edits_High Capacity Wells_Write_Up.docx

All,

We took the revision_revisions.pdf document, accepted Caryl's changes, and then incorporated our proposed edits (see attached) with tracked changes. We see no benefit to adding the reference to the petitions as the case is pending and we believe that the write-up should reflect only concrete policy. So we suggest eliminating the reference to the current court challenge. The addition of the Lake Beulah case information is fine. We made a few other minor edits to improve clarity.

Thank you for the opportunity to comment.

Thanks,
Adam

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Adam Freihoefer
Phone: (608) 267-7638
adam.freihoefer@wisconsin.gov

High Capacity Wells

High capacity wells are regulated under s. 281.34, Wis. Stats, and are defined as "a well, except for a residential well or fire protection well, that, together with all other wells on the same property, except for residential wells and fire protection wells, has a capacity of more than 100,000 gallons per day." Any well, regardless of pump capacity, on a high capacity property is considered a high capacity well[1]. Section NR 812.09 Wis. Adm. Code requires prior DNR approval for the construction or reconstruction of a high capacity well. Technical review of high capacity wells ~~proposed for use at ISM facilities is no different than any other type of high capacity well, in that the review process and approval criteria are the same~~is limited to what is ~~as~~ described in state statute and administrative code. Two components are considered by DNR when reviewing a high capacity well application: construction and water withdrawal.

The proposed well construction is reviewed to ensure that it both meets the specifications of the well construction code (NR 812) and that the proposed well's construction does not contribute to, or worsen any groundwater contamination. Contaminants can be anthropogenic or naturally-occurring, and both are considered when reviewing well construction. For example, there are areas of Wisconsin that have naturally occurring arsenic in aquifer formations. Mobility of this arsenic may have been increased when pumping of large volumes of groundwater altered redox conditions of the aquifer from reducing to oxidized. In these areas applicants may be required to construct wells in such a manner that they do not draw water from formations or intervals that are known to contain arsenic bearing minerals. It is also important that wells be constructed with a good seal around the well casing. A proper seal prevents the well from becoming a pathway for contaminants to migrate from the surface or shallow subsurface to water supply aquifers below.

For the withdrawal portion of the review, the DNR changed its procedures in July 2011 in response to a 2011 Wisconsin Supreme Court decision[2] to review each application for a new high capacity well to determine whether the well, along with other high capacity wells on the contiguous property, would result in significant adverse environmental impacts to waters of the state – which includes all streams, lakes, wetlands, public and private wells. Section NR 820.12(19), Wis. Adm. Code defines significant adverse environmental impact as:

> *Alteration of groundwater levels, groundwater discharge, surface water levels, surface water discharge, groundwater temperature, surface water temperature, groundwater chemistry, surface water chemistry, or other factors to the extent such alterations cause significant degradation of environmental quality including biological and ecological aspects of the affected water resource.*

If the DNR determined the proposed well could directly result in significant adverse environmental impacts, the DNR would either deny the well application or request that an applicant modify their proposed construction or operation of the well to prevent such impacts. DNR based the need to modify or deny an application on the projected impacts to the affected water resource, *e.g.*, estimated reductions in stream flow or lake level, and the resultant impacts to water temperature, the fishery and other ecological aspects of the stream or lake. In conducting these assessments, DNR considered site-specific hydrogeology, separation distance between the well(s) and the water resource, the hydrology and characteristics of potentially-affected surface waters, construction details of nearby wells, characteristics of the proposed wells such as construction, pump capacity, and the water use and pumping schedule for the proposed well and any other existing wells on the property. This version of the technical review methodology was in place from July 2011 through May 2016.

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[1] 2015 Wis Act 177 granted an exception for wells used for residential or fire protection purposes from being considered high capacity wells effective October 1, 2016. s. 281.34(1)(b) Wis. Stats.

[2] Lake Beulah Management District v. Department of Natural Resources, 2011 WI 54, 355 Wis. 2d 47, 799 N.W.2d 73. The Court held that, pursuant to Wis. Stat §281 and the Legislature's delegation of the State's public trust duties, the DNR has the authority and a general duty to consider whether a proposed high capacity well may harm waters o the state. Upon what evidence, and under what circumstances the DNR's general duty is implicated by a proposed high capacity well is a highly fact-specific matter that depends upon what information is presented to the DNR decision makes by the well owner in the well permit application, by citizens, and by other entities regarding that permit application while it is under review by the DNR.

On May 10, 2016 Wisconsin's Attorney General issued a formal opinion (OAG-01-16) on the Department's review authority of high capacity well applications. Two key conclusions from the Attorney General's opinion are[3]:

- DNR may impose conditions or requirements on high capacity well approvals only if the agency has explicit permission or an explicit requirement to do so in statute or rule; and

- DNR does not have explicit authority to consider cumulative impacts or to impose monitoring requirements on high capacity well approvals.

As a result of the opinion, the DNR will review and condition high capacity wells using the same approach applied prior to the 2011 Lake Beulah Supreme Court decision. ~~in addition to determining whether the proposed well meets well construction requirements, t~~The DNR will review each high capacity well application to determine whether the proposed high capacity well:

- is within a groundwater protection area (within 1,200 feet of a class 1, 2 or 3 trout stream or a designated outstanding or exceptional resource water);

- may impact springs with flow greater or equal to one cubic foot per second;

- will result in water loss greater than 95 percent;

- will result in 10 or more feet of water level drawdown in the public utility well based on 30 days of continuous pumping from the proposed high capacity well or well system; and

- will degrade safe drinking water and the groundwater resource or impact public safety.

The applications that meet any of the criteria listed above will be subject to an environmental review process and any approval will include conditions to ensure the well does not result in significant adverse environmental impacts and may require preparation of an environmental impact statement. In addition, if any of these conditions is met, the DNR may include specific conditions in the high capacity well approval, which may include conditions as to location, depth, pumping capacity, rate of flow and ultimate use.

~~The Attorney General's opinion and DNR's change of policy are currently being challenged in court~~[4]

[3] http://dnr.wi.gov/topic/wells/highcapacity.html

[4] ~~The Attorney General's opinion and DNR's change of policy are the subject of litigation brought by Clean Wisconsin at the end of October 2016. Clean Wisconsin has challenged the DNR's approval of nine high capacity well permits despite evidence of cumulative impacts to public trust waters.~~

2017 01 05 Terrell request to Rupiper correcting redline App G Groundwater Protection Planning Framework

Jan. 5, 2017

Mike Rupiper:

I do have a concern about the changes submitted in the redline version of Appendix G Groundwater Protection Planning Framework. I think my concerns are easily addressed with the three corrections requested below.

Water policy can be a moving target so it is hard to keep a report like App. G current. My request is to make the document accurate as possible as of the date of the public hearing and/or CARPC approval.

I consulted with a water policy attorney and have quoted from his email to me.

The corrections requested are:

1. Directly quote the AG's Opinion https://docs.legis.wisconsin.gov/misc/oag/recent/oag_1_16 replacing the following problematic summary of the AG O (quoted below in Bold Italics):

Background*: Page 212 of the document states that* ***"The Attorney General concluded that section 227.10(2m), Stats., prohibits the DNR from conducting an environmental review of a high capacity well unless it is one of the specific categories identified in…."*** *The AG's opinion specifically addresses whether DNR has authority to impose monitoring conditions or require a cumulative impact analysis as conditions for high capacity well permits. It doesn't directly address whether DNR generally has the authority to conduct an environmental review.*

The practical impact of the AG's opinion is that DNR will not conduct environmental reviews for high cap well applications unless they fall within one of the statutorily prescribed categories. However that was not the specific question that the AG was asked to answer and it was not the conclusion that the AG reached. This is splitting hairs to some extent, but given the already potentially far-reaching impact of the AG's opinion, I would suggest being as precise as possible and not needlessly giving it more legs.

2. Include a Footnote summarizing the Lake Beulah decision at the place where the redline deletes mention of the case.
3. Include a Footnote that the AG's Opinion and DNR's change of policy are currently being challenged in court.

Background: *The AG's Opinion and DNR's change of policy are the subject of litigation brought by Clean Wisconsin at the end of October. Clean Wisconsin has challenged the DNR's approval of 9 high capacity well permits despite evidence of cumulative impacts to public trust waters.*

Thank you for your attention to this matter. I can be reached by cellphone (608) 213-4648. Leave a message if I don't pick up. I am traveling today.

Thank you.

Caryl

Caryl Terrell, CARPC Commissioner
19 Red Maple Trail
Madison WI 53717

Rupiper, Mike

From: Rob Montgomery <Rob@ma-rs.org>
Sent: Tuesday, November 29, 2016 7:46 AM
To: Kakuska, Michael
Cc: 'ROBERT C. PROCTER (RProcter@axley.com)'; Rupiper, Mike
Subject: RE: Groundwater Comments
Attachments: AppendixG_July2016_Draft RJM comments.pdf

Mike and Mike:

Attached are comments on chapters 7, 8 and 9 of the groundwater protection planning framework. In general, I think this is a terrific document. Very very informative reading for anyone that's interested in groundwater issues and groundwater management in Dane County or in other areas of the state for that matter.

From a comments standpoint, as you can see in the attachment, the biggest issue that I see is the recommendation that groundwater issues be considered in land use decisions at a local level – which has the potential of creating a "football" because it is a very technical issue and there really aren't any standards to apply. This comment would be applicable to general residential or commercial development that doesn't have a specific groundwater quality concern, but rather an incremental increase in potable water supply demand. I believe that a regional planning process to identify the issues especially with respect to groundwater recharge base flow, etc. is essential (now that we have the tools to do it) and that this water supply planning result should be incorporated into municipal water supply plans that have defined service areas for land use types. That way a particular site approval (for example a residential subdivision of 100 lots) does not become a political football with respect to various interpretation of regional groundwater management issues.

My other comment that might be worth some editorial consideration is in the chapter 6 discussion of groundwater policy and latest decisions. Clearly this is an evolving situation with the Atty. Gen.'s opinion and further issues in the legislature and elsewhere. So I think your summary discussion, which is good, should clearly identify the end date of the description so someone doesn't pick this up three years from now and think they have the latest update on state or local groundwater policy.

But in general, well done, good document, looking forward to talking with you this afternoon.

Regards

Rob Montgomery, PE, D.WRE
Montgomery Associates: Resource Solutions LLC
119 S. Main St.
Cottage Grove, WI 53527

608-839-4422 office
608-225-0682 cell

From: Kakuska, Michael [mailto:MikeK@CapitalAreaRPC.org]
Sent: Monday, November 21, 2016 8:54 AM

Local Controls

Local units of government can voluntarily attempt to minimize the amount of salt applied to roadways. Many have evaluated and begun implementing various options to address this, such as purchasing new equipment (e.g., automated spreaders) and/or using alternative materials (e.g., sand).

Impact/Effectiveness

A survey of salt storage sites in the county revealed that most sites are protected by coverings and linings. Salt use is probably a greater threat to groundwater quality than salt storage in Dane County. Increasing chloride and sodium concentrations in Madison wells are associated with deicer use. Many communities have begun instituting salt reducing measures, but these do not appear to be keeping up with the increase in lane miles being traveled. Increasing salt concentrations in wells and surface water is cause for concern. Additional efforts are needed to reverse this disturbing trend.

Stormwater Management

We should support additional research and demonstration projects to provide safe winter driving conditions while reducing chloride and sodium application

State Controls

Proper infiltration of stormwater has many benefits, including maintaining groundwater recharge and reducing stormwater runoff and pollutant loads. In order to ensure safe drinking water, contaminants must be removed from stormwater before it reaches groundwater aquifers. Although soil is a tremendous natural filter, it cannot treat contaminated stormwater runoff beyond its limits. Pretreatment practices have a wide range of removal rates for different contaminants. This why it is important to design and implement practices to remove pollutants that take into account the potential contaminants in stormwater, site specific conditions, and maintenance needs.

Under NR 151.124 and 151.244, a construction site landowner must meet the performance standard for infiltration of runoff taking into account site restrictions. A technical standard has been developed to assist site designers in the assessment of the site and its adequacy in providing infiltration that is both protective of groundwater and practical to implement. The intent of the infiltration standard is to encourage infiltration of runoff. This requirement is tempered by a series of prohibitions and exemptions for the purpose of minimizing the risk of groundwater contamination and to address the practicality of implementation.

Local Controls

In 1989 the Legislature created the Dane County Lakes and Watershed Commission to serve as a coordinating and advisory agency for water quality issues within Dane County government (Wisconsin Act 324). Under the Act, the Commission may propose to the county board minimum standards for local regulations and ordinances for municipalities and the county to protect and rehabilitate the water quality of the surface waters and groundwater. In addition, CARPC provides review and approval of stormwater practices through its Urban Service Area amendment process. Dane County, local municipalities, and CARPC encourage and promote development practices that minimize surface water runoff and maximize infiltration and groundwater recharge. Several researchers have pointed out that stormwater infiltration practices that have been designed correctly pose little threat to the groundwater.[2,3,4] Current stormwater regulations and technical standards require pretreatment to remove contaminants prior to infiltration.

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[2] Pitt, R. et al. 1999. *Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration.*
[3] Mikkelsen, P. et al. 1997. *Pollution of Soil and Groundwater from Infiltration of Highly Contaminated Stormwater.*
[4] Barraud, S. et al. 1999. *The Impact of Intentional Stormwater Infiltration on Soil and Groundwater.*

Impact/Effectiveness

With the emphasis on volume control BMPs in recent years, the issue of soil and groundwater contamination is gaining more attention. Recent research has improved the outlook on the risks of soil and groundwater contamination. Long-term (20 year or more) studies of groundwater below infiltration basins have shown no adverse effects from infiltrating stormwater.[5] Pretreatment of stormwater runoff from critical pollutant sources areas is required. The WDNR has developed program guidance and technical standards for best management practices for meeting the infiltration performance standard of NR 151.[6,7] By standard, no stormwater is infiltrated without treatment unless it is clean rooftop runoff.

The potential for groundwater table rise through extensive infiltration needs to be considered in planning infiltration facilities.

Well Construction and Abandonment

State Controls

The operation and design of public water systems is regulated by the WDNR under Chapter NR 811. This chapter requires the proper abandonment of all unused or unsafe private wells within municipal water service areas. Well construction, siting and abandonment is further regulated by the WDNR (chapter NR 812). This code prohibits the use of any well for disposal of sewage or for surface discharge drainage. Drillers of potable wells and pump installers need to be licensed, and well construction reports must be sent to the WDNR. Chapter. NR 141 establishes standards for designing, installation, construction and abandonment of groundwater monitoring wells.

Local Controls

Chapter NR 845, Wis. Adm. Code, was developed to allow for county administration of the private well construction and abandonment program. Dane County ordinance Chap. 45 details the county well construction and abandonment code. Improperly abandoned wells represent a real threat to groundwater that can be removed at relatively low cost. PHMD typically issues 60 to 70 abandonment orders each year.

The City of Madison has a local ordinance (Madison General Ordinance Sec. 13.21) which addresses well abandonment and operation permits within the Madison Water Utility service area. The ordinance provides that all unused and unsafe wells be properly abandoned. Owners of all other wells are required to obtain an operating permit from the utility which requires the owner to show that the well meets code and produces safe water. Well operating permits must be renewed every five years.

Impact/Effectiveness

Abandoned or unused wells pose a great threat to the safety and quality of groundwater drinking water supplies. An unused well provides a direct path for contaminants and pollutants to the underground aquifers that supply working wells. The WDNR considers a well to be permanently abandoned when it has been completely filled and sealed by a licensed well driller or pump installer using materials and methods as prescribed in section NR 812.26 of the Wisconsin Administrative Code. This generally means that the pump and any piping inside of the well casing have been removed and the well has been filled from bottom to top with proper filling materials, such as cement grout, concrete grout, concrete, a clay/sand slurry mix or, in some cases, bentonite chips. Some unsafe or unused wells are identified through complaints and are required to be abandoned as appropriate, but many wells may go undetected.

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[5] Emmons and Oliver Resources. 2012. *Update on the Science of Volume Control BMPs.*
[6] http://dnr.wi.gov/topic/Stormwater/standards/postconst_standards.html
[7] http://dnr.wi.gov/topic/stormwater/documents/InfiltrationPerformanceStandardGuidance.pdf

Unused wells are a direct line for contamination into clean ground water. The WDNR provides financial assistance for low income well owners to properly abandon unused private wells. The WDNR also provides Well Compensation grants for replacing, reconstructing or treating contaminated private water supplies that serve a residence or used for watering livestock. Well construction work must be done according to WDNR specifications and the contaminated well properly abandoned.

Groundwater Quantity

State Controls

The Groundwater Quantity Act (2003 Wisconsin Act 310) expanded the State's authority to consider environmental impacts resulting from certain high capacity wells. Under that law, proposed high capacity wells that are within 1200 feet of trout streams and other designated high quality waters, wells that could have significant impacts on a spring, and wells with a high water loss are subject to more rigorous evaluation. Since the 2004 adoption of Act 310, the scope of the WDNR's review of proposed high capacity wells has expanded even more as a result of the July 2011 Wisconsin Supreme Court decision in the *Lake Beulah* case and a September 2014 administrative law decision in the *Richfield Dairy* case. When reviewing high capacity well applications, WDNR staff now consider impacts to all waters of the state including streams, lakes, wetlands, municipal wells and private wells, cumulative impacts of the proposed well along with other wells on the same property and water withdrawals on other nearby high capacity well properties. If significant impacts are predicted, the well application may be modified or the approval may be denied.

In terms of current administrative code, NR 860 and NR 820 establishes the process, requirements, and criteria for water use permitting. NR 856 establishes requirements for registering water withdrawals and accurate reporting to support management efforts. NR 852 establishes a statewide water conservation and efficiency program, specifying mandatory measures in the Great Lakes Basin. In other areas of the state, the regulation applies to wells that would result in an average water loss greater than 2,000,000 gals./day over a 30 day period (although, relatively few wells exceed this amount).

Wisconsin law also requires a statewide water supply service area planning process for public water supply systems (Wis. Stats. 281.348). This is being promulgated through proposed rule NR 854. This rule would apply to water supply systems that serve a population of 10,000 or more. These systems would be required to be covered by an approved water supply service area plan by December 31, 2025.

The goal of the planning process is to help sustainably manage the state's waters to provide an adequate quantity and quality of water to customers; to prepare for increasing demands on the state's groundwater and surface water resources; and to protect springs, streams, wetlands, and other natural features. The law requires that communities assess the quantity and quality of available water supply through a practical planning process to ensure dependable, safe, and cost-effective water delivery to customers.

A municipal or regional planing process is the best approach to address water demand issues associated with increased development. Some communities have done this on an ad hoc basis

Local Contr

Local units of government in Dane County can voluntarily manage their water supplies to help minimize impacts to their environment and promote more sustainable water use. Significant collaborative efforts have been made among federal, state, and local entities to conduct groundwater modeling and planning activities in the region coordinated by CARPC. While much has been accomplished, more can be done in this regard.

Impact/Effectiveness

The WDNR has the "authority and general duty" to consider whether a proposed high capacity well may harm waters of the state.[8] The WDNR is also required to consider the cumulative impacts when deciding whether to approve, condition or deny high capacity well approvals.[9] The WDNR uses both its expertise in water resources management and its discretion to determine whether its duty as a trustee of the Public Trust resources is implicated by a proposed high capacity well permit application. The approvals are predicated on the facts and information presented to the WDNR by the well owner in the permit application, by citizens, and by other entities while the permit is under review. In Dane County significant state-of-the-art scientific tools have been developed (presented in this report) that can help inform communities and aid the WDNR in its decisions and approvals. Furthermore, continued regional collaboration will be needed among municipalities to minimize and mitigate the impacts of high capacity well withdrawals on the region's ground and surface waters, and promote more sustainable plans and practices in the future. Therefore, cooperative groundwater management policy in the region should include:

- a regional/watershed approach
- up-to-date hydrologic science
- increased focus on addressing cumulative impacts
- opportunities for water conservation and reuse
- monitoring and reporting
- adequate funding
- widespread participation and collaborative support

Good points – the issue is the lack of standards and whether concerns about high-capacity wells and water supply impacts in general should be applied to specific development project approvals.

Public Information and Education

A well-developed educational program concerning groundwater protection should continue to be pursued in Dane County. Only through an informed public will groundwater be adequately protected. Public education on the occurrence and movement of groundwater, potential pollution sources and groundwater protection strategies is necessary to maintain the high quality of groundwater in the county. Also, in many instances, public knowledge is imperative for complying with state and local regulatory programs pertaining to groundwater management.

Particular emphasis in groundwater educational programs should be placed on how land use activities affect drinking water quality. This is especially relevant in Dane County because all residents obtain their drinking water from groundwater supplies. If individuals understand that their drinking water supply may be at risk, they will probably be more inclined to prevent water pollution.
General as well as detailed groundwater educational programs should be promoted to the public. Various federal and state agencies have all developed general educational and resource materials that are available to Dane County residents. A good place to begin with groundwater education is in the school systems of the county, where environmental awareness may be instilled at an early age. The Groundwater Coordinating Council publishes the *Wisconsin Groundwater Education Resource Directory,* which is a compendium of the agencies, people and resource materials available for use in groundwater education.

In addition to general educational efforts, specific programs should be developed (or intensified) and targeted at groups that have a direct land use impact on groundwater. In many instances, this means the agricultural community. Thus, educational programs concerning agricultural best management practices should receive emphasis. Best management practices that minimize detrimental groundwater impacts include pest control strategies that limit pesticide use (e.g., crop rotation), proper pesticide container and

[8] Wisconsin Supreme Court *Lake Beulah* decision, July 2011 .
[9] Administrative Law Judge *Richfield Dairy* decision, September 2014.

Chapter 8: Groundwater Protection Recommendations

This chapter presents groundwater protection recommendations for each potential groundwater pollution source. They incorporate and expand upon much of the work and findings from previous plans and studies, as well as information from the supporting sections of this plan. These proposals provide a range of both regulatory and non-regulatory approaches to groundwater protection that should be promoted and implemented by various state and local organizations as early as opportunity and circumstance allow. Chapter 9 follows with selected short-range priority actions recommended for immediate management agency consideration.

Siting and Land Use Decisions Affecting Groundwater

Assessment of Conditions and Management Controls:

Sources of groundwater pollution are many and varied. Many activities that contribute to groundwater pollution are closely integrated into our economic and cultural way of life. The type, duration, and intensity of our use of the land will largely determine the risk posed to groundwater.

Thus, siting and land use decisions made by state agencies, and by county and local governments and private landowners, can have a significant effect on drinking water supplies. In addition, wellhead protection programs are an important approach to drinking water supply protection. Although these programs are being required by federal and state regulations, given the catastrophic impacts on a community resulting from contamination of their water supply, the costs of replacing a contaminated well, the near impossibility of cleaning up a contaminated aquifer, and the importance of citizen confidence in the safety of their drinking water, this preventive approach has been strongly supported by communities – basically giving them local control and responsibility for their drinking water supplies.

All good comments

Some aspects of wellhead protection programs, such as protecting important recharge or source areas, may need to extend beyond municipal boundaries, and will therefore require intergovernmental cooperation. Communities may want to consider extraterritorial zoning, intergovernmental agreements, open space plans, etc. Such an approach can reduce the risk of drinking water contamination and may avoid future infrastructure costs such as new wells or treatment.

Much of the information and analytical capacity for incorporating groundwater protection concerns into land use planning and decision making processes exists (e.g., hydrogeologic model, contamination risk maps, guidelines and criteria in **Reference Table 20,** etc.). Greater efforts are needed to ensure that impacts on groundwater quality are routinely and adequately considered in siting and land use decisions.

Recommendations:

1. All significant land use and siting decisions should include evaluation of potential groundwater and hydrologic impacts. Local units of government and other responsible agencies should seek CARPC staff participation, technical review and comment on land use proposals.

Re #1 - 3: There could be problems local commissions or boards trying to judge the relative significance of groundwater issues in site by site land use decisions given that there are no standards, and in general limited understanding of the issues. These issues should be considered in water supply planning by municipalities.
4 Correct

2. Specific language should be added to county and municipal zoning and subdivision ordinances to require that groundwater protection receives adequate consideration and assessment during the review and approval process. CARPC staff can provide technical assistance in this regard.

3. Local units of government with land use authority should be encouraged to collaborate with the county and formally incorporate groundwater impact assessment procedures into their land use decisions. In addition, municipalities should consider treating facilities with the potential to affect groundwater quality as conditional or prohibited uses in wellhead protection areas under a municipal wellhead protection ordinance. Also consider alternative options for plan implementation such as intergovernmental agreements and open space plans, CARPC staff can provide technical assistance in this regard.

4. CARPC staff should continue to provide assistance, through the Regional Hydrologic Modeling and Management Program, to local units of government and water supply agencies in Dane County, to maximize participation in the state Wellhead Protection Program and develop groundwater protection programs to protect all major water supply wells and aquifers in the region.

Solid Waste Disposal Sites

Assessment of Conditions and Management Controls:

A deterioration in groundwater quality has occurred near several closed landfills in Dane County. Strict regulatory requirements have been established for landfills since the 1980s; however, most closed landfills in the county were developed before these requirements were enacted. Groundwater quality is being monitored near only a small number of landfills, thus the extent of groundwater pollution may not be realized.

Recommendations:

1. The WDNR in conjunction with the Regional Planning Commission should establish a priority list for monitoring closed or inactive landfills.

   Highest priority for monitoring should be closed or inactive landfills located in areas of high or extreme contamination risk in municipal well protection zones. Subsequent priority should be for landfills in areas of moderate risk in well protection zones.

2. New solid waste disposal sites and landfills should continue to be located and designed to protect surface and groundwater. Proposed landfills should be located outside of municipal well protection zones and in areas of low to moderate groundwater contamination risk. WDNR and other responsible state agencies should seek CARPC staff participation, technical review and comment on proposed locations.

Stormwater Infiltration

Assessment of Conditions and Management Controls:

Significant progress has been made in Dane County and around the state to reduce or mitigate the potential increase in flood peaks through stormwater volume control ordinances. Maintaining pre-development infiltration promotes additional benefits as well, including maintaining stream baseflow, water temperatures, and also water quality considerations (since pollutant loading is a function of runoff volume).

Both NR 151 and Dane County Chapter 14 require development projects to maintain some level of pre-development stay-on volumes. Dane County's ordinance (mirrored by other municipalities in the county) is more stringent, requiring 90 percent of pre-development stay-on for all development types. Additional requirements common to both regulations effectively protect groundwater quality. Municipalities should consider maintaining 100 percent pre-development stay-on volumes, where opportunities exist, as well as enhanced recharge above natural rates to help make up for well water withdrawals in a community.

Recommendations:

DNR Technical Standards (and guidance) may not cover the topic or include latest research. Broaden the language

1. Stormwater Best Management Practice designers should consult WDNR Technical Standards for guidance and acceptability of infiltration practices and performance.

2. Municipalities should consider enhanced infiltration (above current levels) to help offset well water withdrawals in appropriate areas and where potential groundwater mounding/flooding will not negatively impact existing development or property.

3. Municipalities should actively encourage, promote, and track demonstration infiltration practices as part of current urban development in the region. Opportunities for public and private partnerships to undertake and assess new and innovative options for infiltration should be actively sought in partnership with CARPC. Practices such as porous pavement, roof gutters connected to infiltration trenches, and channeling of residual runoff to an infiltration pond could be installed and their effectiveness monitored.

Department of Safety and Professional Services

1. Consider and utilize the information, tools, criteria and guidelines identified in this plan in site approvals, or permits that could impact groundwater in Dane County. DSPS and other responsible agencies should seek CARPC staff participation, technical review and comment on proposed projects and locations.

2. Support and work with Dane County in implementing a program for tracking and ensuring that required inspection and maintenance is provided for all on-site wastewater systems in Dane County.

3. Increase support of monitoring and research directed at the groundwater impacts of on-site wastewater systems, and the development of practical and economical nitrogen-removing on-site systems.

Local Government

Dane County

Over-broad-need standards or process to be specified or there will be inconsistent and subjective application

1. Incorporate and utilize the information, tools, criteria and guidelines identified in this planning framework in all land use decisions, site approvals, or permits that could impact groundwater. Support and participate in the cooperative Regional Hydrologic Modeling and Management Program. Dane County should seek CARPC staff participation, technical review and comment on proposed projects and locations.

2. Add specific language to the county zoning and subdivision ordinances to require that groundwater impacts and protection receive consideration and assessment during the review and decision-making process. CARPC staff can provide technical assistance in this regard.

3. Work with WDNR, CARPC, and local units of government to develop effective wellhead protection programs and source protection plans for all municipal wells in Dane County, particularly where protection programs need to extend beyond local jurisdictional boundaries.

4. Maintain an inventory of livestock, feedlots, and manure storage facilities in Dane County.

5. Increase promotional and educational efforts directed at developing farm nutrient management plans and integrated pesticide management programs.

6. Continue implementation of the triennial inspection and required maintenance tracking system for all on-site wastewater systems in Dane County. Expand distribution of public informational materials on proper use and maintenance of on-site wastewater systems and private wells, including safe use and storage, collection and disposal of household hazardous materials and personal care products. Provide information, guidelines and contacts to rural homeowners for testing drinking water quality.

7. Continue to seek to assume responsibility for, or participate in, approval of septage landspreading sites.

8. Continue to expand and improve household hazardous waste programs, and emergency response capability for hazardous material spills.

Cities, Villages, Towns, and Local Water Supply Agencies

Over-broad-need standards or process to be specified or there will be inconsistent and subjective application

1. Conduct water supply service area planning in the region as required by Wis. Stats. 281.348 with assistance provided by CARPC and in collaboration with local management agencies.
2. Incorporate and utilize the information, tools, criteria and guidelines identified in this plan in all land use decisions, site approvals, or permits that could impact groundwater. Support and participate in the cooperative Dane County Regional Hydrologic Modeling and Management Program. Municipalities and water supply agencies should seek CARPC staff participation, technical review and comment on proposed projects and locations.
3. Add specific language to the local zoning and subdivision ordinances to require that groundwater impacts and protection receive consideration and assessment during the review and decision-making process. CARPC staff can provide technical assistance in this regard.
4. Work with WDNR, Dane County and CARPC to develop effective wellhead protection programs and source protection plans for all municipal water supplies. Fix wells with faulty casing separating deep and shallow aquifers to help prevent downward movement of contaminants.
5. Work with DATCP and WDNR to expand monitoring and testing of older underground tanks in municipal well protection zones and areas of high or extreme contamination risk.
6. Continue and expand efforts to reduce the groundwater impacts of salt storage and use and snow removal practices.
7. Cooperate with WDNR and utilize the information and criteria in this plan and through the CARPC Regional Hydrologic Modeling and Management Program in locating and designing new high-capacity wells, in order to minimize adverse groundwater impacts.
8. Continue to work with WDNR, Dane County and CARPC to incorporate stormwater infiltration practices into local erosion/stormwater control ordinances that will protect groundwater.
9. Cooperate in expanding and improving household hazardous waste collection and public information programs, and in improving emergency response to hazardous materials spills.

Capital Area Regional Planning Commission

Absolutely!

How can this be put into the CARPC budget?

1. Conduct water supply service area planning efforts in the region as required by Wis. Stats. 281.348. More specifically, promote proactive and collaborative regional groundwater management planning among communities to address water availability and sustainability issues related to both ground and surface water resources.
2. Assist municipalities and resource management agencies consider and utilize the information, tools, criteria and guidelines outlined in this plan in all land use decisions, site approvals, or permits that could impact groundwater. These include high-capacity well proposals, WPDES permits for wastewater facilities discharging to groundwater, biosolids and septage land spreading sites, stormwater infiltration practices, sanitary landfills, large manure storage lagoons or feedlots, large unsewered subdivisions, prioritizing remediation sites and monitoring, etc.

Table 30
Groundwater Protection Roles and Responsibilities

Potential Pollution Sources / Groundwater Management Controls		Regulatory						Non-Regulatory					Other				
		Permits	Site Approval	Land Use Controls	Construction Standards	Use Restrictions	Inspection & Testing	Guidelines/Criteria	Minimizing Input of Pollutants	Education	Voluntary BMP	Governmental Coordination	Training & Demonstration	Monitoring	Research & Inventory	Remedial Action	Emergency Response
Waste Disposal	Solid Waste Disposal Sites	S	S	L	S		SI	SI	L			SL		SI	SI	SL	
	Land Application of Wastewater	S	S		S		SL	S						SI	SI	L	
	Sanitary Sewers	S		SL	SL		S	S				SL				L	SL
	On-Site Wastewater Systems	SL	SL	sL	S		L	L		L		SL			SL		
	Sludge/Biosolids Application	S	S	S			S	S				SL		L	SL		
	Septage Applications	S(L)	S(L)	S(L)			S(L)	S(L)				SL			S(L)		
Agriculture	Manure Storage	L			SL			sL		sL	L				L		
	Fertilizer & Manure Spreading							sL		sL	L		SL				
	Pesticide Application					S		SL	L	SL	L		SL	S			
	Irrigation	S			S		S			sL	L						
Hazardous Materials	Household Hazardous Materials								L	sL							
	Above-ground Storage	S			S		L	S		SL		SL				SL	SL
	Underground Storage	S			S		SI	S		SL		SL		SL	S	SL	SL
	Transmission Pipelines	F			F		F	F								S	S
	Spills											SL	SL	SL	S	SL	SL
	Junkyards/Salvage Yards	L		L			L										
Other	Salt Storage & Deicing					S	L	S		L	L	L			SL		
	Well Construction & Abandonment	SL	SL		SL		SL	S		SL		L			L		
	Groundwater Quality and Quantity Management	SI	SI	XX				sL		sL		L		S	sL	L	

F = Federal Role
S = State Role
L = Local Role (including CARPC)
= Priority Action Needed

This is the section of concern described above

L or S = Primary Role
I or s = Assisting or Advisory Role
(L) = Possible Future Regulatory Program

From: Helmuth, Jeffrey A - DNR
To: Kakuska, Michael
Cc: Helmuth, Lisa D - DNR; Freihoefer, Adam T - DNR
Subject: RE: Groundwater Comments
Date: Friday, December 09, 2016 2:10:07 PM
Attachments: ISM SA hicap excerpt.docx

Mike,

I cannot edit the document at the link below so I'll list my suggestions for your consideration:

1) pp. 210-211 Delete the Lake Beulah Supreme Court Case and Richfield Dairy Decision sections and add a section titled High Capacity Wells after the Wisconsin's Groundwater Protection Act, 2003 Wisconsin Act 310 section on p 210. That section can be copied from the attached excerpt from the 6/16 WDNR Industrial Sand Mining Strategic Analysis (http://dnr.wi.gov/topic/EIA/documents/ISMSA/ISMSA.pdf, starting on p. 2-43). That text has been vetted by our legal staff so I'd include it as-is.

2) p. 230 Delete the following text from the 1st paragraph under State Controls :

> Since the 2004 adoption of Act 310, the scope of the WDNR's review of proposed high capacity wells has expanded even more as a result of the July 2011 Wisconsin Supreme Court decision in the *Lake Beulah* case and a September 2014 administrative law decision in the *Richfield Dairy* case. When reviewing high capacity well applications, WDNR staff now consider impacts to all waters of the state including streams, lakes, wetlands, municipal wells and private wells, cumulative impacts of the proposed well along with other wells on the same property and water withdrawals on other nearby high capacity well properties. If significant impacts are predicted, the well application may be modified or the approval may be denied.

3) p. 231 Delete the following text from the Impact/Effectiveness Section:

> The WDNR has the "authority and general duty" to consider whether a proposed high capacity well may harm waters of the state.[8] The WDNR is also required to consider the cumulative impacts when deciding whether to approve, condition or deny high capacity well approvals.[9] The WDNR uses both its expertise in water resources management and its discretion to determine whether its duty as a trustee of the Public Trust resources is implicated by a proposed high capacity well permit application. The approvals are predicated on the facts and information presented to the WDNR by the well owner in the permit application, by citizens, and by other entities while the permit is under review.

4) p. 254 In the row for Groundwater Quality and Quantity Management I'd add an "L" under Land Use Controls for wellhead protection. I'd add an "S" under Construction Standards - DNR has codes for community, private and monitoring well construction. I'd add an "S" under Inspection & Testing if you consider drinking water monitoring as part of this. I'd add an "S" under Governmental Coordination – that's what the GCC is about. I'd make it an upper case "S" under Research & Inventory (joint solicitation)and Remedial Action (our Remediation and Redevelopment program). Remedial Action should also have an "F" for the Superfund program.

Thanks for the opportunity to comment. Let me know if you have questions.

Jeff

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Jeff Helmuth
Phone: (608) 266-5234
jeffrey.helmuth@wisconsin.gov

1.1.1 High capacity wells

High capacity wells are regulated under s. 281.34, Wis. Stats, and are defined as "a well, except for a residential well or fire protection well, that, together with all other wells on the same property, except for residential wells and fire protection wells, has a capacity of more than 100,000 gallons per day." Any well, regardless of pump capacity, on a high capacity property is considered a high capacity well.[1] Section NR 812.09 Wis. Adm. Code requires prior DNR approval for the construction or reconstruction of a high capacity well. Technical review of high capacity wells proposed for use at ISM facilities is no different than any other type of high capacity well, in that the review process and approval criteria are the same as described in state statute and code. Two components are considered by DNR when reviewing a high capacity well application: construction and water withdrawal.

The proposed well construction is reviewed to ensure that it both meets the specifications of the well construction code (NR 812) and that the proposed well does not contribute to, or worsen any groundwater contamination. Contaminants can be anthropogenic or naturally-occurring, and both are considered when reviewing well construction. For example, there are areas of Wisconsin that have naturally occurring arsenic in aquifer formations. Mobility of this arsenic may have been increased when pumping of large volumes of groundwater altered redox conditions of the aquifer from reducing to oxidized. In these areas applicants may be required to construct wells in such a manner that they do not draw water from formations or intervals that are known to contain arsenic bearing minerals. It is also important that wells be constructed with a good seal of the annular space around the well casing. A properly sealed annulus prevents the well from becoming a pathway for contaminants to migrate from the surface or shallow subsurface to water supply aquifers below.

For the withdrawal portion of the review, the DNR changed its procedures in July 2011 in response to a 2011 Wisconsin Supreme Court decision[2] to review each application for a new high capacity well to determine whether the well, along with other high capacity wells on the contiguous property, would result in significant adverse environmental impacts to waters of the state – which includes all streams, lakes, wetlands, public and private wells. Section NR 820.12(19), Wis. Adm. Code defines significant adverse environmental impact as:

> *Alteration of groundwater levels, groundwater discharge, surface water levels, surface water discharge, groundwater temperature, surface water temperature, groundwater chemistry, surface water chemistry, or other factors to the extent such alterations cause significant degradation of environmental quality including biological and ecological aspects of the affected water resource.*

If the DNR determined the proposed well could directly result in significant adverse environmental impacts, the DNR would either deny the well application or request that an applicant modify their proposed construction or operation of the well to prevent such impacts. DNR based the need to modify or deny an application on the projected impacts to the affected

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[1] 2015 Wis Act 177 granted an exception for wells used for residential or fire protection purposes from being considered high capacity wells effective October 1, 2016. s. 281.34(1)(b) Wis. Stats.

[2] *Lake Beulah Management District v. Department of Natural Resources*, 2011 WI 54, 355 Wis. 2d 47, 799 N.W.2d 73

water resource, *e.g.*, estimated reductions in stream flow or lake level, and the resultant impacts to water temperature, the fishery and other ecological aspects of the stream or lake. In conducting these assessments, DNR considered site-specific hydrogeology, separation distance between the well(s) and the water resource, the hydrology and characteristics of potentially-affected surface waters, construction details of nearby wells, characteristics of the proposed wells such as construction, pump capacity, and the water use and pumping schedule for the proposed well and any other existing wells on the property. This version of the technical review methodology was in place from July 2011 through May 2016.

In May 2016 the Wisconsin Attorney General issued a formal opinion (OAG-01-16) regarding the DNR's authority to consider environmental impacts when reviewing high capacity well applications. The Attorney General concluded that through the adoption of 2011 Act 21 (§ 227.10(2m)), "[t]he Legislature has defined the parameters in which DNR can act to protect the state's navigable waters and additionally has clarified the ways in which DNR can regulate non-navigable waters." (OAG ¶52). The Attorney General concluded that section 227.10(2m), Stats., prohibits the DNR from conducting an environmental review of a high capacity well unless it is in one of the specific categories identified in Wis. Stat. § 281.34, such as a well in a groundwater protection area; with a water loss of more than 95 percent of the amount of water withdrawn; or that may have a significant environmental impact on a spring (these categories are specified in Wis. Stat. § 281.34(4)); or if it may impair the water supply of a public utility (as described in Wis. Stat. § 281.34(5)). According to the Attorney General, the Department lacks explicit authority to review the environmental impact of wells outside of those specific categories identified in Wis. Stat. § 281.34. High capacity well reviews are conducted in accordance with the Attorney General opinion as of June 2016[3].

[3] http://dnr.wi.gov/topic/wells/highcapacity.html

210 Martin Luther King Jr. Blvd. Room 362 Madison, WI 53703 Phone: 608-266-4137 Fax: 608-266-9117 www.CapitalAreaRPC.org info@CapitalAreaRPC.org

December 13, 2016

NOTICE OF PUBLIC HEARING
January 12, 2017

Recommending to the Wisconsin Department of Natural Resources Amendment of the *Dane County Water Quality Plan* by Adopting the Update of Appendix G: Dane County Groundwater Protection Planning Framework

A public hearing on an update to Appendix G of the *Dane County Water Quality Plan* (Dane County Groundwater Protection Planning Framework) will be held at the Capital Area Regional Planning Commission meeting on January 12, 2017, at 7:00 p.m. in City County Building, Room 351, 210 Martin Luther King, Jr. Blvd., Madison, WI. The Public Hearing Draft of the report may be downloaded from the CARPC website at www.CapitalAreaRPC.org.

The last *Dane County Groundwater Protection Plan* (Technical Appendix G to the *Dane County Water Quality Plan*) was prepared by the Dane County Regional Planning Commission in 1999. There have been a number of significant changes since then, including: 1) enactment of Wisconsin's Groundwater Protection Act and Wis. Stat. § 281.348 outlining the requirements for developing water supply service area plans for public water systems in the state; and 2) advancements in the science, electronic information, and computer technologies that have allowed greater insight into developing more protective and sustainable groundwater policies and practices than in the past. While the 2004 Summary Plan update to the *Dane County Water Quality Plan* provided a brief overview of the evolving management of groundwater protection, the purpose of this update is to bring the *Dane County Water Quality Plan* up to date with a more comprehensive assessment and analysis of the current state of issues and groundwater management practices. It is also meant to foster and promote more collaborative and sustainable partnerships among the various groups focused on ground and surface water resources in the region. These local strategies, tied to a more coordinated regional framework and assisted by Regional Planning Commission staff, are expected to provide more effective and improved groundwater quantity and quality protection in the Capital Region overall.

Adoption of the Appendix update may be considered by the Commission after the public hearing. For information or questions, contact Mike Kakuska at MikeK@CapitalAreaRPC.org or 608-266-9111.

E-mailed to: Water Utility Directors
City, Village and Town Clerks
Joe Parisi, Dane County Executive
Paul Soglin, Mayor, City of Madison
Jerry Derr, President, Dane County Towns Association
Jon Hochkammer, President, Dane County Cities and Villages Association
Scott McDonell, Dane County Clerk
Sharon Corrigan, Chair, Dane County Board of Supervisors
Mary Kolar, Chair, Dane County Zoning and Land Regulation Committee
Patrick Downing, Chair, Dane County Environment, Agriculture and Natural Resources Committee
Jenni Dye, Chair, Dane County Personnel and Finance Committee

Rebecca Power, Chair, Dane County Lakes and Watershed Commission
Lyle Updike, Vice Chair, Dane County Lakes and Watershed Commission
Susan Jones, Coordinator, Dane County Lakes and Watershed Commission
Al Matano, Chair, Madison Area Transportation Planning Board
Bill Schaefer, Manager, Madison Area Transportation Planning Board
Todd Violante, Dane County Department of Planning and Development
Michael Mucha, Director and Chief Engineer, MMSD
Kevin Connors, Director, Dane County Land and Water Resources Dept.
Charles Hicklin, Dane County Controller
Robert Phillips, City Engineer, City of Madison
Tom Heikkinen, General Manager, Madison Water Utility
James Kuehn, WisDOT
Diane Paoni, WisDOT
Greg Searle, WDNR Fitchburg Service Center
Sharon L. Gayan, WDNR
Lisa Helmuth, WDNR Central Office
Tim Asplund, WDNR Central Office
Curt Sauser, Sewer Connections and Extensions, MMSD