

**SAUGEEN, GREY SAUBLE, NORTHERN BRUCE PENINSULA
SOURCE PROTECTION COMMITTEE MEETING #96**

A G E N D A

November 15, 2024

1:00 p.m. – 4:00 p.m.

Grey Sauble Conservation Administration Centre
and Virtual Via Web/Ex

CALL TO ORDER

1. Adoption of Agenda
2. Declaration of Pecuniary or Conflict of Interest
3. Adoption of Minutes of July 26, 2024 meeting
4. Matters Arising from the Minutes
 - Follow-up from delegation presentation to be addressed under Report 7b
5. Correspondence
 - MECP response to SPC questions regarding private drinking water systems and the role of the Clean Water Act
6. Reports
 - Administration Report – Report 6a attached
 - Communications Report – Report 6b attached
7. New Business
 - Kimberley Karst Study - Report 7a attached
 - Kemble Karst Concerns – Report 7b attached
8. Other Business
9. Next Meeting and Adjournment

SOURCE PROTECTION COMMITTEE

MINUTES – MEETING # 95

MEETING: SOURCE PROTECTION COMMITTEE

DATE: July 26, 2024

TIME: 1:30 P.M.

LOCATION: GREY SAUBLE CONSERVATION & VIRTUALLY

CALL TO ORDER

Chair called the meeting to order at 1:35 p.m.

In Attendance: Chair, Carl Kuhnke
John Fruin, Harley Greenfield, Amy Harrison, Dick Hibma, Dan Orr, John Rodgers, Gord Timmerman, Les Nichols, Paul McQueen

Virtual Attendance: Andrew Barton

Proxy Appointed By: Jim Hanna to Dick Hibma

Others Present: Laura Collings, Ex-officio, Ministry of the Environment, Conservation and Parks (MECP)
Carl Seider, Project Manager, Drinking Water Source Protection (DWSP)
Valerie Coleman, Recording Secretary, GSCA

Also in Attendance: Karen Gillan, Program Supervisor & Communications Specialist, DWSP
Tim Lanthier, CAO, Grey Sauble Conservation
Erik Downing, Acting General Manager/Secretary-Treasurer, Saugeen Conservation
Cathy Moore Coburn, Councillor, Municipality of Georgian Bluffs
Tobin Day, Councillor, Municipality of Georgian Bluffs
Danielle Fischer, Centre Wellington
Margaret Vincent, Member Service Representative – Bruce/Grey
Members of the Public

Regrets: Jim Hanna
Troy Pelletier

The Chair introduced and welcomed Members, attendees, and the public.

1. Adoption of Agenda

**Motion No.
SPC-24-265**

**Moved by John Fruin
Seconded by Amy Harrison**

THAT the Agenda be adopted as distributed/amended.

Carried

2. Disclosure of Pecuniary or Conflict of Interest

Source Protection Committee (SPC) members were reminded to disclose any pecuniary interest that may arise during the course of the meeting. No disclosures of pecuniary interest were expressed at this time.

3. Adoption of Minutes

**Motion No.
SPC-24-266**

**Moved by John Rogers
Seconded by Amy Harrison**

THAT the Minutes of the March 22, 2024 Source Protection Committee meeting be adopted as distributed/amended.

Carried

4. Matters Arising from the Minutes

No matters arose from the previous minutes.

5. Correspondence

Letter from Honourable Minister of Health Sylvia Jones dated May 30, 2024 respecting Private Drinking Water Well Testing was **noted and filed**.

Letter from Concerned Citizens respecting Large Silage Storage Facility Concerns was **noted and filed**.

6. Delegation

The committee received a delegation from Thorsten Arnold regarding contamination of private drinking water wells due to nearby agricultural activity.

Mr. Arnold provided a presentation with regard to the factors at play in the area of the contaminated wells and noted that agricultural intensification, mixed residential and agricultural landscapes, and the predominance of karst that lacks overburden protection as the main contributing factors.

Mr. Arnold sited a similar situation in Kewaunee County, Wisconsin where agricultural restrictions have been implemented in vulnerable karst areas.

Mr. Arnold outlined his recommendations and request of the Source Protection Committee.

There was discussion regarding the situation. Understanding was expressed, however; it was noted that the SPC has a specific mandate from the MECP that is limited to municipal wells and water systems under the approved Source Protection Plan. Members agreed to speak to the issue as a committee at a future meeting.

7. Reports

Administration Report 7a

The Program Manager reviewed Report 7a. Staff submitted a final signed copy of the 2024/2027 DWSP program transfer payment agreement to the Ministry for approval. It was noted that as part of the Sec. 34 amendments, staff anticipate several plan updates, including a karst study in Kimberley and Shallow Lake wellhead protection areas.

Staff provided updates on municipal wells in Chesley, Blue Mountains, and Kincardine.

Staff received a copy of the Bruce Power radiological waterborne effluent results for 2023 and noted that levels remained relatively stable.

Communications Report 7b

The Program Supervisor and Communications Specialist reviewed Report 7b. Staff will be representing the region on a Walkerton Water Tragedy 25-year Commemoration advisory committee. The committee will be seeking input for a video storyboard highlighting the past, present and future of drinking water protection.

Staff noted that two articles highlighting portions of the 2023 Annual Report were published in the Ontario Farmer in May.

Staff discussed their participation in a meeting with OFA representatives regarding possible outreach and education around karst features and best management practices.

8. New Business

Report 8a

The Project Manager reviewed Report 8a and outlined the Section 34 amendment process and proposed schedule.

**Motion No.
SPC-24-267**

**Moved by Paul McQueen
Seconded by Amy Harrison**

RECOMMENDATION: THAT the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Committee receives the Sec. 34 Consultation Update Report 8a for information and directs Staff to continue with consultation efforts and proposed in the Report.

Carried

Report 8b

The Project Manager reviewed Report 8b and spoke to staff's preliminary observations made at Talisman Spring 1 and Spring 2. It was noted that staff have been working with municipal staff to determine what data may be available from the water treatment plant that would highlight potential connections between ground and surface water sources in the area. Additionally, staff are preparing a strategy for the installation of stream gauges both upstream and downstream of Wodehouse Creek and Kimberley Springs 1 & 2.

Next steps include the development of a Request for Proposals for a consulting contract to assist in reviewing the data and preparation of possible groundwater modelling work as part of the Wellhead Protection Area review.

**Motion No.
SPC-24-268**

**Moved by Harley Greenfield
Seconded by John Fruin**

RECOMMENDATION: THAT the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Committee receives the Kimberley Karst Report 8b for information and directs Staff to prepare a Request for Proposals for consulting services for possible groundwater modelling work.

Carried

8. Other Business

There was no other business.

9. Confirmation of Next Meeting and Adjournment

The next Committee meeting will be held on November 15, 2024, at the Grey Sauble Conservation Administration Headquarters.

There being no further business, Chair Carl Kuhnke declared the meeting adjourned at 3:45pm.

Carl Kuhnke
Chair

Valerie Coleman
Recording Secretary

Hi Carl and Carl,

I understand that you both have asked the ministry about the role of the Source Protection Committee in addressing drinking water issues associated with private drinking water systems, such as concerns brought forward to the committee by landowners on Zion Church Road.

There are three ways that the Clean Water Act, 2006 could be used to support addressing these concerns in the Source Protection Plan (SPP) for the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region. The Source Protection Authority and the Source Protection Committee are encouraged to work together to consider the following options in regards to the source protection plan policy outcomes that could be achieved, when balanced with the costs and time to implement each of the potential options.

1. Locally initiated inclusion of the wells

- Under Section 8 of the *Clean Water Act*, a council of a municipality may pass a resolution requiring that the terms of reference include other drinking water systems (such as a cluster of private wells; reference General Regulation 4.1.1.a; municipality would need to determine if this is a cluster) in the source protection plan.
- Following resolution, the source protection authority – with the source protection committee deeming them advisable - may propose amendments under subsection 13 of the CWA to the Terms of Reference for the Source Protection Plan to include other drinking water systems.
- Upon the MECP Minister's approval of the revised Terms of Reference, adding other drinking water systems to the source protection plan follows the s. 34 amendment process including securing support from municipality(ies) affected by the proposed source protection plan amendments.

2. Identification of drinking water issue

- Under Technical Rule 114 in the Director's Technical Rules, if the Source Protection Authority is aware of a parameter that may be described as a drinking water issue under clause 15(2)(f) of the Clean Water Act, 2006, the Authority is then directed by the Rule to describe it as a drinking water issue in accordance with Technical Rule 115.
- Where a drinking water issue is associated with drinking water systems that are not mentioned in clause 15(2)(e) of the Act (e.g., can include those private systems within a vulnerable area that have not been formally incorporated into the SPP through a municipal resolution or by the Minister), the identification of the issue must be chemical-based as per Technical Rule 114(3).

- Evidence would need to be presented to confirm that the concentration of chemicals is leading to the deterioration of the quality of the water for use as a source of drinking water or a downward trend in the water quality.
- Where Technical Rule 114 has been met, and the identified issue is anthropogenic in nature, as per Technical Rule 115, then an issue-contributing area is delineated.
- For issues identified per Technical Rule 114(3), drinking water threats associated with that issue can only be classified as a “moderate” drinking water threat [Technical Rule 134.1(2)]. In this situation, the committee has the option to include policies addressing the moderate risks in the source protection plan.
 - Policies managing the identified drinking water issue could also indirectly support mitigating other drinking water threats that may discharge pathogens within the issue contributing area.
- If the Committee identifies the drinking water issue described above, the technical work required under the Technical Rules would be initiated as part of a s. 34 amendment process to the assessment report, and where the committee is of the opinion to include moderate risks policies, the source protection plan will need to be updated.

3. Education and Outreach Policies

- Finally, the source protection authority and the source protection committee can consider developing policies governing incentive programs and education and outreach programs, pursuant to subsection 22 (7) of the Act and paragraph 4 of section 26 of O.Reg 287/07, with respect to drinking water systems in the source protection area that are not set out in clause 15 (2) (e) of the Act (e.g. these policies can apply to private systems in a source protection area that are not brought into the SPP through municipal resolution or by the Minister through the ToR). For example, local policies governing such private systems could include education and outreach to support residents in protecting their wells and being aware of activities that could contribute to water quality issues.
- Using this approach, the Terms of Reference would not require amending, but rather the standard s. 34 amendment process apply to the source protection plan amendment.

We are happy to discuss any of the above information further at your request. Please contact Jennifer McKay, Manager, Source Protection Section at Jennifer.mckay@ontario.ca or Laura Collings, Program Analyst at Laura.collings@ontario.ca.

Thank you again,

Kirsten 

Kirsten Service (she/her)

Director, Conservation and Source Protection Branch | Land and Water Division

Ministry of Environment, Conservation and Parks

705-987-5144 | kirsten.service@ontario.ca

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REPORT #6a

TO: SOURCE PROTECTION COMMITTEE

DATE: NOVEMBER 15, 2024

SUBJECT: ADMINISTRATION REPORT

Municipal Well Updates

Arran Elderslie - Chesley Well

The municipality also started the Class EA process in July for alternatives to replace the existing municipal Well #1 in Chesley with a new well, due to significant iron bacteria formation that has clogged the well screen resulting in a significant reduction in water supply. The municipality is currently working on getting the test well expanded to accommodate a 10-inch casing for the proposed new production well #4. The location for the production well was based on a review of possible alternatives along with feedback received during public meetings. A technical report was recently provided for staff review and considerations from a source protection perspective.

Town of the Blue Mountains –

The Town is currently engaged in a Municipal Class EA for the construction of a new drinking water intake pipe leading into Georgian Bay for a new Water Treatment Plant in Craigeith. There are currently a few possible intake locations under consideration near Craigeith Provincial Park. Consultants are currently conducting raw water quality sampling in the area, with work on delineation of vulnerable areas/IPZ mapping and preliminary assessment of threats.

South Bruce – Teeswater

The Municipality was unable to find/secure an alternative well site for the proposed new well in Teeswater, so are looking at the existing municipal well site as a possible location for the new well (approximately 50 metres East of the existing well).

Kincardine – Tiverton Drinking Water System

The Municipality is currently engaged in a Municipal Class EA to evaluate alternatives to increase the Tiverton Drinking Water System capacity. The Class EA will investigate options to increase water supply, such as additional groundwater wells and connecting to the Kincardine Drinking Water System. The timing for completion of this analysis is anticipated for 2026.

West Grey – Durham Well

Staff received a notice from the Municipality of West Grey that they have initiated a Class EA for the construction of a new municipal water supply well in Durham (Well #3). The current proposed location for the new well is within the existing WHPA delineation area for Wells 1A & 1B, which will facilitate the WHPA re-delineation, however, may impact the amount of water that can be safely drawn from the new well.

New MECP Sec.34 Guidance Document

The new s.34 guidance provides clarity on the following key topics:

- Mandatory regulatory requirements
- Roles and responsibilities of SPA, SPC, municipality, MECP and implementers
- Consultation

Appendices have been updated to streamline MECP's review of final submissions:

Appendix A Checklist: *Submission Requirements for Assessment Report and Plan Amendments*

- Checklist/ electronic folder structure for submission
- Includes instructions on how to update the Source Water Protection Information Portal (SWPIP) policy interface database with proposed policy changes

Appendix B: *Affected Area Summary*

- Tables updated to request summary of changes to affected areas, including applicable policies

Appendix C: *Consultation Summary*

- Updated with fillable tables to capture and organize comments received during all stages of consultation and how comments were addressed

Walkerton Private Well – Fuel Contamination

On October 30th, staff were informed by the municipality of Brockton that a resident who was on a private well requested to be connected to the municipal water supply, as their private well smelled like gasoline. Municipal staff contacted MECP who conducted multiple site visits over the summer to complete well testing. One potential source of contamination was a gas station located less than 200 meters from the contaminated well. An order was issued to the owner of the gas station to conduct various investigations and possible remediation.

The affected property is located about 2.5km from the Wellhead Protection Area -C for the Walkerton Wells 7 & 9. The direct distance for the municipal wells themselves is about 4.5km. As this property is not within the source protection area, there are no Risk Management Plans for fuel storage threats in this area. Staff informed the municipality that there are a couple Provincial Groundwater Monitoring Wells in the area that may be of assistance for potential groundwater monitoring purposes.

Staff from the local Public Health Unit were also notified.

Bruce Power – Bruce C Nuclear Project

Bruce Power is proposing the site preparation, construction, operation and decommissioning of a new nuclear generating station within the existing Bruce Power nuclear power site, located in the Municipality of Kincardine, Ontario. As proposed, the Bruce C Nuclear Project would provide

up to 4,800 megawatt-electric of new nuclear generating capacity in Ontario and operate for 60 to 100 years. Several nuclear reactor technologies will be considered for the project. The project assessment is being conducted in collaboration with the Canadian Nuclear Safety Commission.

RECOMMENDATION: THAT the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Committee receives the Administrative Report 6a for information.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Carl Seider', written in a cursive style.

Carl Seider
Project Manager
Drinking Water Source Protection

REPORT #6b

TO: SOURCE PROTECTION COMMITTEE

DATE: November 15, 2024

SUBJECT: COMMUNICATIONS

Consultation on Section 34

Consultation on the Section 34 work has had three phases; early engagement, pre-consultation and public consultation. There have been stakeholders, including government ministries, municipalities, local First Nations and landowners contacted during these phases. Comments received have been acknowledged and resolved upon receipt. Overall, the consultation on the Section 34 updates has been uneventful. During the public consultation period no comments were received from public or Ministry, all previous comments having been captured and resolved during early engagement and pre-consultation periods. The Walkerton Herald Times provided coverage in the media; see attached article titled “Brockton Council endorses expanding requirements for Lake Rosalind area discretionary septic inspection. Otherwise there have been limited comments, outside of stakeholders providing municipal motions that are related to and required for process and submission for approval.

Commemoration of 25 years since the Walkerton Water Tragedy

Carl and Karen continue to represent our region on an Advisory Committee with other Conservation Authority staff from across Ontario. The working group received concerns from Saugeen Conservation staff about the messaging and original approach plan to this commemoration. In response to these concerns and to be more respectful to Walkerton area citizens, the goals have been updated. The overarching goal is having viewers understand the importance of continued source water protection.

This will be achieved through four objectives:

1. To provide a connection to the past so that viewers can understand how the Walkerton tragedy occurred and personally impacted the community.
2. To demonstrate how the Walkerton tragedy has had a direct impact on source water protection practices and the overall safety of municipal drinking water in Ontario.
3. To demonstrate how important it is that we continue to improve source water protection and how there is more work that needs to be done.
4. To highlight that the Walkerton tragedy could have happened in any community, emphasizing the importance of safeguarding drinking water sources through vigilant protection methods.

Drinking Water Source Protection in the News
September issue of Rural Voice, “What is Karst”
submitted article via local Federation of Agriculture
office. (see attached)

Beyond The Fenceline GCFA publication – “Protection
plan amendments include mapping managed lands”
October 2024, Public consultation notice for section 34
(see right)

November issue of Rural Voice, article by Melisa
Luymes, “Protecting Karst Aquifers” (see attached)



Social Media

Currently, we are engaging the public with themes around: seasonal messaging and knowledge building of the DWSP program. This seven-week social media campaign began on Wednesday October 2nd and will end on Wednesday, November 13, 2024.



Post for photo: Fall clean-up? Select non-toxic chemicals and cleaners to help protect sources of drinking water.

Learn more:
<https://bit.ly/46TZXMy>
#SourceWaterON
#WaterWednesdays
#DrinkingWaterSources

RECOMMENDATION: THAT the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Committee receives the Communications Report 6b for information.

Respectfully submitted,

Karen Gillan
Program Supervisor/Risk Management Inspector
Drinking Water Source Protection

https://www.pentictonherald.ca/spare_news/article_f540252e-a06a-5da0-ad37-92a029a55e24.html

Brockton Council endorses expanding requirements for Lake Rosalind area discretionary septic inspection

Pauline Kerr Local Journalism Initiative Reporter The Walkerton Herald Times
Sep 20, 2024

BROCKTON - Brockton council has endorsed a proposed change in drinking water source protection that would see the expansion of requirements for the discretionary septic inspection program around Lake Rosalind.

Carl Seider, Drinking Water Source Protection program manager, made a presentation to council at the Sept. 10 meeting outlining the proposed change.

He noted the septic system inspections would be discretionary, not mandatory.

The septic system inspection program would involve the municipality and risk management official working together to prioritize discretionary inspections in areas where septic systems are known to fail, and where older systems are common, said Seider in his report.

He asked for, and received council's endorsement of the plan. The next step would be approval the proposed changes by the Ministry of Environment, Conservation and Parks.

Seider told council the public consultation process has been underway for a while (since early 2023) and involved working with the landowners' association. He noted there were "no surprises, and no negative comments."

The planned final submission to the province will take place in November.

Coun. Carl Kuhnke declared a conflict of interest and did not vote on the resolution to support the policy. He chairs the area's drinking water source protection committee.

During the question period that followed the presentation, Deputy Mayor Kym Hutcheon commented that the only people who would object would be the ones who knew there was something wrong with their septic systems.

Mayor Chris Peabody commended the Lake Rosalind/Marl Lake joint water quality committee. "They've done an excellent job," he said, describing their work in testing for algae as "a great story of co-operation between the municipality and a citizens' group." He noted that a decade ago, they did have a problem (with blue-green algae) but "the amount now is very low," below drinking water guidelines. "I'm not suggesting you drink the water from Lake Rosalind," he said, "but you could."

The mayor concluded by saying, "The residents took action – it's a great story."

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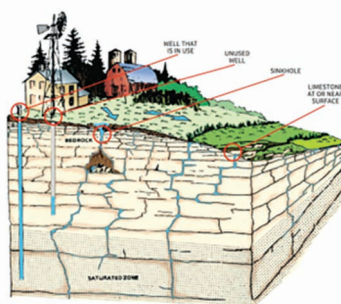
What is Karst?

By: Karen Gillan

Karst is a term used to describe landscapes with distinct bedrock features known as carbonates (e.g. limestone and dolostone), which are prone to weathering by water. According to the Ontario Geological Survey, the Niagara Escarpment areas around Grey and Bruce Counties constitute one of the most regionally extensive and significant dolostone karst plains in North America if not the world.

For example, if large applications of chemicals or manure occur in areas where there is very little soil cover or fractured bedrock, contaminants can move rapidly from surface to groundwater sources. Private septic systems can also pose a risk to groundwater wells in these areas and should be monitored for proper function.

The following graphic shows surface features and the soil profile in a karst areas:



Karst regions have bedrock with connecting cracks and layers between rocks that easily transport water and pollutants to the groundwater.

Why is it a concern?

Karst areas have a lot of cracks and fissures and are often characterized by shallow soils or low overburden. The fractures in karst areas can allow contaminants to travel to groundwater aquifers with minimal to no soil filtration. This groundwater can be the source of drinking water for rural residents; therefore the increased speed of travel and lack of filtration means that contaminants pose a higher risk to landowners in these areas.

Below, centre, is an example from Grey Highlands of a sinkhole and second image is the Wodehouse Creek that becomes a sinking stream and leads to springs in Kimberley-Talisman area.

What can landowners do in these areas?

Areas with high potential for groundwater contamination exist especially in areas where there is bedrock within one metre of the surface. The following best management practices should be considered in areas of higher vulnerability:

- Conduct an assessment of your property and farm practices to counteract the potential for groundwater contamination, following OMAF guidelines: <https://www.ontario.ca/page/assessing-potential-ground-water-contamination-your-farm#section-5>
- Use Environmental Farm Plans & Nutrient Management Plans promoting the '4-Rs' best management practices.
- Ensure proper containment of manure, yard runoff, and any wash water to reduce leaching to groundwater.
- Consider the use of less intensive practices in higher risk areas, such as pasture, cover crops, reduced tillage and soil disturbance.
- Routinely clean out and inspect septic systems to ensure proper functioning.
- Conduct private well testing, as a routine practice.

Using care to consider how your actions on a property can impact water quality below the surface is key to managing risks in karst areas across the region.

Glossary:

Karst - landscape made of limestone.

Landscape - the geographic features of a region.

Limestone - type of sedimentary rock mostly made of calcium carbonate from shells and skeletons of marine organisms.

Sinkhole - hole formed in a rock or other solid material by the weight or movement of water.

Springs - An opening at or near the surface of the earth through which water from underground sources emerges.

NOV 27th

9 AM - 4 PM

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Photo by Kate Lazier
Taken in Grey Highlands

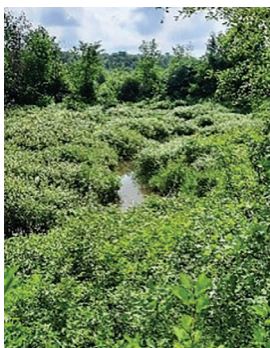


Photo by Grey Sauble Conservation
Taken at Wodehouse Creek

2024 Directors Meetings

September 11
October 18 - AGM
November 13

If you require a new SMV sign for your equipment before heading out on the road, contact our office we have some available to members.

Protecting karst aquifers

Farmers and rural
residents work to
safeguard
groundwater

• By Mel Luymes •



Finley Cameron (right) keeps his cattle out of Judges Creek by watering with a large, round trough as part of his goal to protect the karst aquifer.



Near Lion's Head, Finley Cameron looks on as his cattle gather at the large round trough in his summer pasture, just steps away from the banks of Judges Creek, now fenced off. In the past, it was common for cattle to drink at the cool spring-fed creeks on the Bruce Peninsula, but all that has changed. Livestock watering systems like Cameron's are the new normal on the Peninsula, as farmers work to protect their karst aquifer.

Cameron notes that the cattle much prefer the trough, it is easier for them to drink from. Partnering with the Bruce Peninsula Biosphere Association, with help from local and provincial funding, farmer investments in alternative livestock watering systems are protecting not only surface water, but their groundwater as well.

About 100 kilometres to the south, in the small town of Ayton, residents have been decommissioning their old wells. Without municipal utilities, all residents are on private septic systems and wells. When their wells dried up and they needed to drill deeper, Ron Pfeffer was one of the many residents with abandoned wells on his property. Working in the livestock industry, he was aware of potential groundwater contamination and didn't think twice about hiring a licensed contractor to decommission his old wells. For him it was about peace of mind, and he was even able to access some cost-share funding from the local Source Water Protection Region.

Rural residents in Ontario depend on private wells for their water; it is often the only water source on a property. Thankfully, most will have access to clean water beneath their property, but this makes it all too easy to take our drinking water for granted.

While some might picture aquifers as underground lakes in giant caves, it would be more accurate to imagine them

as layers of sponges filled with water. These sponges are permeable layers of gravel, sand or rock through which water slowly moves, held by more impermeable layers of rock or clay. There are other types of aquifers in which water is held in small fissures within the bedrock itself.

Deep underground, aquifers are genuinely mysterious, but many *Rural Voice* readers, like Finley Cameron, will find themselves living on the most curious of all, a karst bedrock aquifer. While any aquifer can be vulnerable to contamination in certain places, karst is unique and can be quite vulnerable in certain areas.

What is karst?

To understand karst, we need to go way back to a time that southern Ontario was covered in shallow seas. The remains of sea creatures and coral became layers of limestone and dolomite rock, and as the seas disappeared, they left the rocks exposed to rain. Being slightly acidic due to carbon dioxide in the atmosphere, the rains began to slowly wash away the softer limestone layers of this sedimentary rock. Over time, it carved (and is still carving!) vertically and horizontally, creating an underground maze — sometimes as large as rivers and

caverns – through which groundwater flows. In some cases, these caverns destabilized the rock above to collapse and form larger sinkholes.

There are examples of karst aquifers around the world and many in parts of Ontario, but perhaps the most fascinating and beautiful example is the Niagara Peninsula, where its rock layers and caves are visible for all to explore. The Niagara Escarpment stretches from what is now upstate New York to Niagara Falls, up through Ontario, across Michigan’s Upper Peninsula and down to Green Bay, Wisconsin. The Escarpment formed because the rock layers gently sloped towards the middle of the old sea, and a more resistant layer (a bathtub ring of sorts) formed a cap that protected the softer layers underneath.

Glaciers sculpted the rest of the landscape, grinding, transporting and depositing it in various places across the province as they advanced and then melted into our Great Lakes. The sediment the glaciers left behind we call glacial till. This is a layer in the soil profile in which rocks, gravels, sands, silts and clays are all mixed together, unsorted. While wind and water will sort soils by their particle size, glacial till looks like a dog’s breakfast and it is still compacted from the weight of a mile thick ice sheet. This till is a restrictive layer in the soil, which creates and protects aquifers, and is also the reason much of Ontario’s soils are classified as improperly drained and required tile drainage systems in order to be farmed.

But just because much of the older karst landscape is covered in soils (or “overburden”), doesn’t mean it isn’t down there. In some places there are tens of metres of soils and sediment protecting the karst aquifer from what’s happening on the surface. But in other places, there may be only a few feet, or inches, if that. And that’s where things get tricky.

Farmers on the Bruce Peninsula know it well. Karst is close to the surface there and can swallow a stream whole; surface water disappears into the ground like into a

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storm sewer, only to resurface a few kilometres away. Surface water can become groundwater and vice versa. And travel times of groundwater flows through karst aquifers means that water quality can change quite quickly, so these areas require an extra level of precaution.

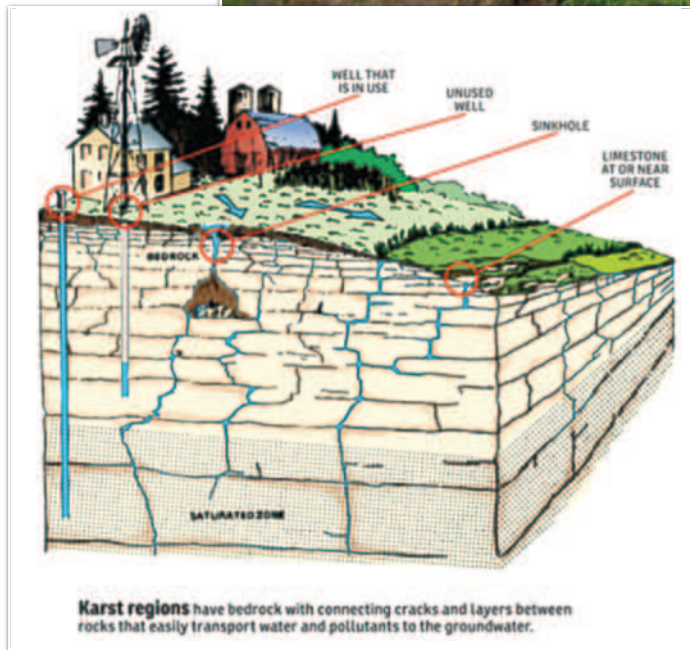
Protecting drinking water

For some, May of 2000 will seem like a lifetime ago, but for many *Rural Voice* readers the Walkerton tragedy will still hurt like it was yesterday. Lest we forget, or for our younger readers, an improperly treated municipal well was contaminated by intense rains that followed a spring manure application. Half of the town got sick from their tap water, and seven people died. It was a literal watershed moment that forever changed the way we think about groundwater in Ontario. Within a few years, we saw the introduction of four new pieces of legislation to protect public health.

First, the Safe Drinking Water Act implemented strict drinking water standards and greater authority to provincial inspectors, along with mandating training, accountability and public transparency. Next, the Sustainable Water and Sewage Systems Act mandated municipalities to assess full costs for water and sewage services, so they couldn't cut corners on public safety in order to buy votes. Third, the Nutrient Management Act set guidelines for storage, handling and application of manure and other nutrients, requiring many farms to create a management plan or strategy to eliminate over-application.

Lastly, the Clean Water Act mandated the protection of municipal water sources, creating protection zones and involving local stakeholders. It created Source Protection Authorities and initiated Source Protection Committees in 19 regions of Ontario that roughly follow watershed boundaries and work closely with Conservation Authorities. The Act appointed Risk Management Officials (RMOs) who co-develop Risk Management Plans with property owners within protection zones.

The Grey Sauble Risk Management office is located at Grey Sauble Conservation's headquarters outside of Owen Sound, and there, RMOs Carl



The Clean Water Act mandated the protection of municipal water sources and in the karst regions of Bruce Peninsula, protection is vital as the bedrock (left) easily transports water and pollutants to the groundwater. Alternate livestock watering systems such as the one below are being created. This one was designed by the Bruce Peninsula Biosphere Association.



Seider and Karen Gillan are responsible to safeguard public drinking water from the Saugeen Watershed to Northern Bruce Peninsula. Gillan grew up on a beef farm and now lives and farms in the area; she works especially on communications and community engagement. Seider has had plenty of experience working with the provincial government in emergency spill response, flood and water related issues. While there were



Dr. Hugh Simpson

many more employed in their office while the program was being developed and protection zones were created from 2006 to 2015, it is now primarily just the two of them.

These maps are now online (search “Source Protection Information Atlas”), and you’ll see that each protection zone’s area is different, depending on local hydrogeological features and where each municipality gets its water.

Groundwater wells have a Wellhead Protection Area (WHPA) and Zone A is regulated 100 metres around the wellhead. Zone B delineates a travel time of two years to the intake and risk manages farming activities, fuel and chemical storage and waste disposal. Zone C has fewer restrictions to land use but may still require some regulation, especially for dense, persistent chemicals like degreasers and wood-strippers.

Surface water intakes have Intake Protection Zones (IPZ) with similar

but much larger protection zones because, in some cases, a fuel spill could reach municipal water in only a matter of hours.

Seider and Gillan work proactively within these protection zones; since 2007 two million dollars of provincial funding has supported businesses, residents and landowners in Grey and Bruce Counties to make necessary upgrades to storages, septic systems, etc. They believe that a voluntary approach with stewardship grants has been very cost-effective and complementary to the regulatory approach and has done more to get public buy-in and support in the long run as well.

The local source protection program is currently working on a study in the Kimberley and Shallow Lake areas to more accurately understand groundwater flows through karst systems. The goal is to re-map the protection zones for municipal wells in Kimberley and Shallow Lake in order to better protect the towns’ groundwater supplies. These areas have been recognized as vulnerable to surface water and sinking streams that can impact drinking water sources.

What about private wells?

It is important to note that these Source Water regulations only protect municipal water sources and do not currently have jurisdiction on private wells, which are instead regulated by Ontario Water Resources Act, Regulation 903. Under this legislation, landowners are responsible for any wells on their property; they must be installed by a licensed contractor or to the specific quality standards in the Act. These involve specifications on depth and diameter, casing and proper sealing for new wells, as well as protection of the wellhead and minimum distance separation from potential contaminants.

Private well standards, ongoing inspection and maintenance and proper decommissioning by licensed contractors are important because wells can be impacted by surface contaminants and in some cases can themselves be a direct pathway of contamination into the very aquifer they are drawing from.

A recent example of private well

contamination occurred in Warton, when livestock wintered in a wet, karstic area, forcing the family to find an alternative drinking water source. This isolated example, along with others from the U.S., has spurred a Bruce County resident to raise the alarm to local councils and call for a local Task Force on karst groundwater, as well as restricting severances, additional private wells and certain farming activities.

With the public understandably concerned, Dr. Hugh Simpson was asked to give a presentation to Bruce County Council. Recently retired from the Ministry of Agriculture, Simpson worked closely with the agricultural community after the Walkerton tragedy and helped develop the Ministry’s best management practices for groundwater and private wells. He now works with the University of Guelph’s Morwick G360 Groundwater Research Institute.

On October 3, Simpson addressed the Council and community concerns with regards to vulnerable aquifers. He emphasized the importance of private well owners being involved in protecting their water supplies: designing, installing and upgrading wells properly, regular water testing and treatment as needed, as well as proper decommissioning of abandoned wells. He outlined the current resources available to municipalities and rural residents and is currently working with community and technical partners across the province to update these materials and research better ways to convey technical information to the stakeholders that need it.

Best practices for private wells

For rural landowners reading this, it is important to know that your well is your responsibility and one to be taken seriously. As Karen Gillan outlined in the September *Rural Voice* issue (see Grey County Federation of Agriculture), there are several things that rural residents can do to protect water for themselves and their neighbours.

First is to do regular water testing. Sampling bottles are available through local Health Units and the testing is completely free, with results available in a matter of days.

Water treatment is an option for homes, as UV, reverse osmosis or other filtration is quite affordable these days.

Regular assessment of the quality of the wellhead and casing is important. Residents can self-assess their property with even just a shovel to find the depth to water or to bedrock in various locations. Soil texture also matters for water quality, with smaller particles (clay) providing the best protection.

Next, assess for proximity to risks from manure, fertilizers, ensilage run-off, septic systems, fuel or chemicals. Proper storage and handling of these materials, regular inspection of septic systems, along with proper setback from wellheads, watercourses, rocky outcrops or hollows on the property will go a long way to protecting groundwater aquifers, karst or otherwise.

There are assessment tools available from the Ministry of Agriculture, within the Environmental Farm Plan and Nutrient Management Plans. A series of rural groundwater factsheets are also available online from the Ministry of Agriculture (search for "Understanding Groundwater") which includes a well maintenance checklist. Furthermore, the Ontario Federation of Agriculture and Farm & Food Care Ontario (then the Ontario Farm Environmental Coalition) created a comprehensive Farm Source Water Protection Framework that is useful for farmers. Local Health Units are also a great source of information about water quality and the Ontario Ground Water Association has a list of licensed well drillers in the province that can provide their expertise.

Rural residents have a vested interest in protecting their groundwater, not only for now but for future generations. In this case, as in most, an ounce of prevention is worth a pound of cure. Whether it means replacing a failing septic system, improving a manure storage, fencing cattle away from a stream, or decommissioning an abandoned well, we all have our part to play to protect our groundwater aquifers. ◇



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REPORT #7a

TO: SOURCE PROTECTION COMMITTEE

DATE: NOVEMBER 15, 2024

SUBJECT: KIMBERLEY KARST STUDY

In August, staff received 5 years of turbidity data from municipal staff available from the water treatment plant to help determine possible connections between groundwater and surface water sources in the area. This data was compared with rainfall/precipitation data from GSCA water monitoring program to help determine possible connections and travel times for the Kimberley Springs 1 & 2.

Staff provided this data to Dr. Worthington to get some preliminary thoughts on the suitability of the data to help determine travel times for the area. Below is a summary of the comments provided by Dr. Worthington on these preliminary findings:

**Notes on correlation between turbidity and rainfall data at Kimberley
Steve Worthington September 16, 2024**

I have gone through the turbidity, rainfall, and rain/snowmelt data, and will use some figures here to illustrate my ideas.

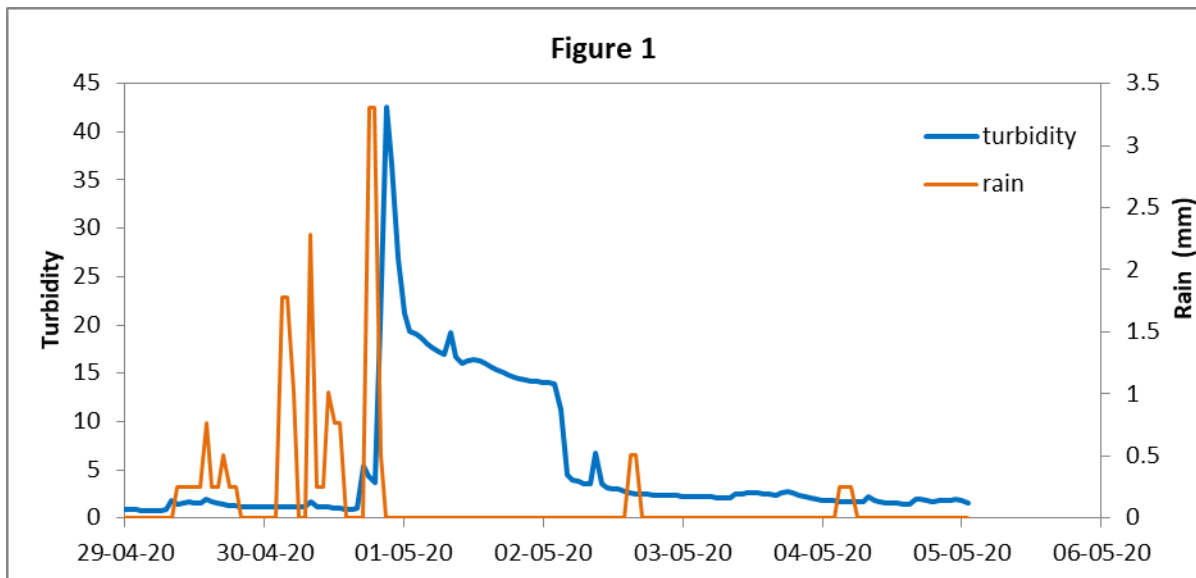


Figure 1 shows a typical rain event and turbidity response. There is a large increase in spring turbidity and this occurs over just a few hours, but we cannot be certain from this one event

whether the large turbidity increase is due to the rain which started 35 hours earlier or the more intense rain starting two hours earlier, or a combination of the two.

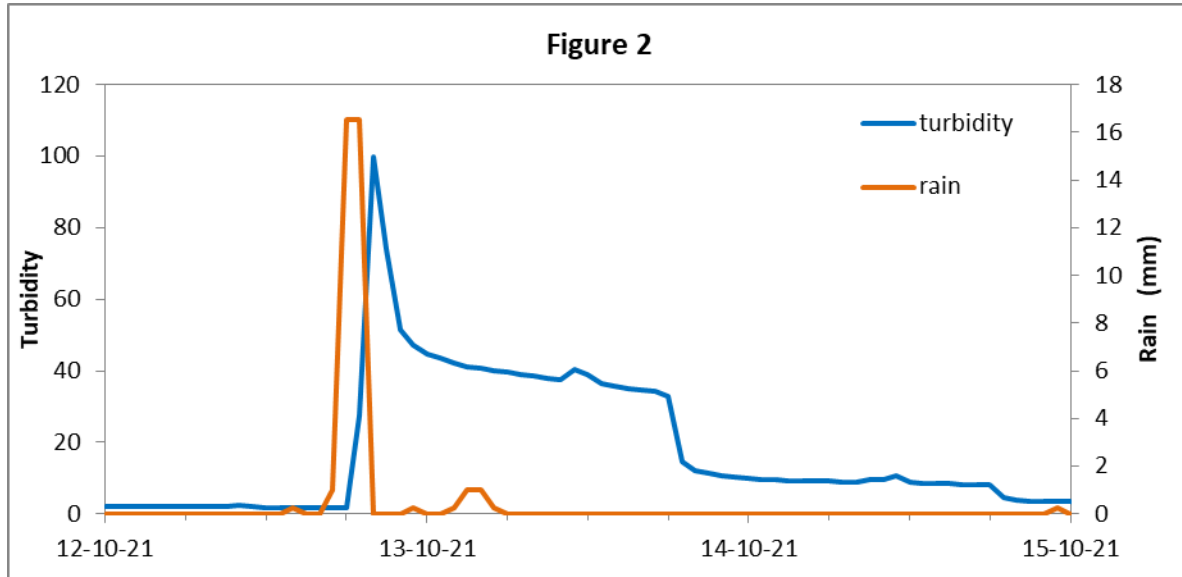
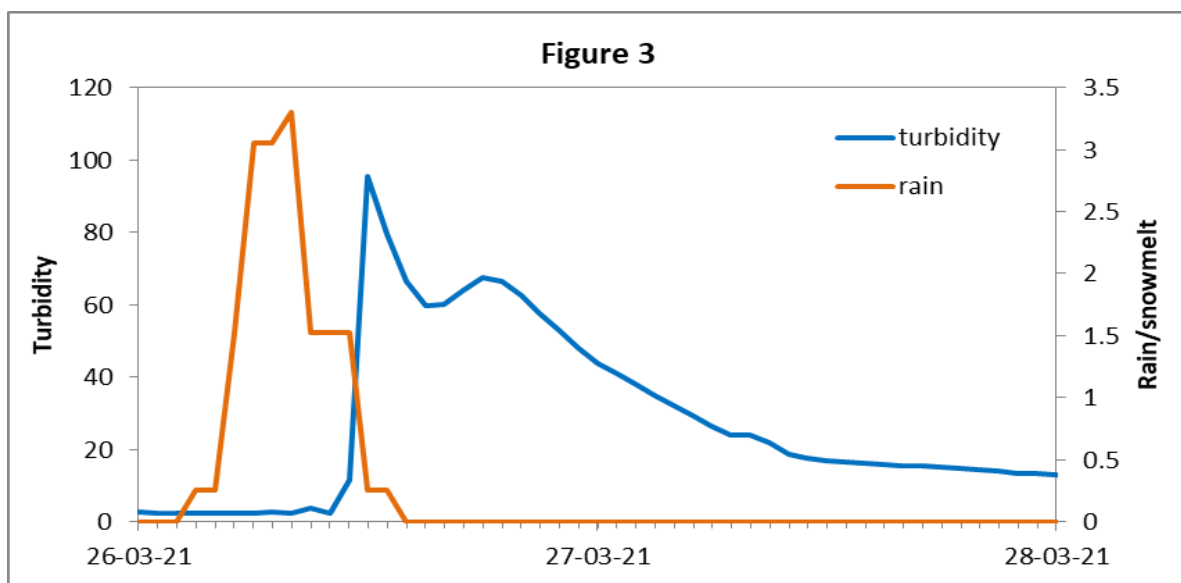


Figure 2 is simpler to interpret since there was two hours of heavy rain followed one to two hours later by a large increase in turbidity. The simplest interpretation is that there is one or more conduits in the dolostone connecting Wodehouse Creek to the springs. The intense rain (33 mm in two hours) would likely have caused an increase in turbidity in the creek within minutes. Wodehouse Creek at its closest is 1400 m from the springs, but there is a tributary that is 1200 m from the springs at its closest that could be a partial source for the springs. A travel time of < two hours would imply a groundwater velocity of >14 km/d, or >0.17 m/s. That is fast, but I have carried out several groundwater tracer tests in Ontario dolostones in high flow conditions that were faster. More commonly, the lag is longer, such as the approximately six hours in Figure 3.



If the source of the turbidity were from percolation recharge, including close to the springs, then a gradual increase in spring turbidity would be expected, starting soon after the onset of rain. However, the sudden increase that happens some hours after the onset of rain is indicative of there being a single large source of water that suddenly becomes turbid. Wodehouse Creek is the best candidate, and the positive tracer test from there in the 1970s provides strong confirmation. The data also show the usual seasonal response to rain. In summer there is a large moisture deficit in the soil, so large rain events often produce little increase in turbidity at Kimberley. In winter, rain on snow events can sometimes produce large turbidity responses. There's much more analysis that could be carried out on the data.

On October 9th, staff held a meeting with Dr. Worthington, municipal staff and GSCA staff on to discuss next steps on the data collection phase of the project. It was agreed that staff would install some stream gauges (water levels) at one or two locations upstream and downstream of Wodehouse Creek, as well as downstream from the Talisman Springs 1 & 2 (see photos below). These loggers were installed on October 21st and will be in place over the next 6 months to collect data. Staff are also planning on doing periodic site visits at these locations to get more detailed water quality data with hand-held monitoring units (i.e. electrical conductivity, pH, and turbidity). It is the hope that these data loggers will provide enhanced groundwater information to assist in the review of the groundwater model used to delineate the protection area.



RECOMMENDATION: THAT the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Committee receives the Kimberley Karst Study Report 7a for information.

Respectfully submitted,

Handwritten signature of Carl Seider

Carl Seider
Project Manager
Drinking Water Source Protection

REPORT #7b

TO: SOURCE PROTECTION COMMITTEE

DATE: NOVEMBER 15, 2024

SUBJECT: KEMBLE AREA KARST CONCERNS

At the July 26th Source Protection Committee (SPC) meeting, Thorsten Arnold provided a presentation and backgrounder on vulnerable karst geology in the Kemble area and concerns related to private drinking water systems and agricultural practices. At this meeting, SPC expressed support and sympathies towards affected landowners in the area, however, it was noted that the SPC has a specific mandate from the Ministry of the Environment, Conservation and Parks (MECP) that is limited to municipal wells and water systems under the approved Source Protection Plan.

As a result of this meeting and discussions held with SPC members, staff engaged with Ministry staff to get a better understanding of the possible role that the Clean Water Act (CWA) could play in support of these issues. Generally speaking, the CWA and Technical Rules outline a process whereby amendments to the local Source Protection Plan Terms of Reference would be required to address threats to individual private wells, as the current approved Source Protection Plan only applies to municipal drinking water systems.

The CWA provides a framework for managing the risks associated with private well clusters, if these are included in the local Terms of Reference. In order to include these private systems into the Source Protection Plan, the affected municipality would need to initiate technical work/studies to prove that the cluster of wells are hydrologically connected and that these wells could be designated as a ‘Drinking Water Issue’, with associated ‘Significant Drinking Water Threats’ as defined under Sec.22 of the CWA. If these studies are successful, then the Source Protection Authority would proceed with the usual Sec.34 amendment process, including all consultation and stakeholder engagement processes.

Alternatively, an ‘Issues Contributing Area’ can be created for certain threats to a broader vulnerable source protection area (i.e. Highly Vulnerable Aquifer), such as the case for salt threats that have been designated to larger vulnerable areas in other Source Protection Regions. This approach however would only enable the development of ‘Moderate’ threat policies under the SPP, such as education and outreach initiatives.

Given these technical requirements and the length of time required to proceed with proposed changes under the CWA, it is recommended that staff continue to work with municipalities and local agricultural partners across the Region to promote Best Management Practices and alternative solutions to better address these concerns. These alternative solutions could include enhanced municipal By-Laws related to permitted land-use activities and septic inspections in karst areas.

Staff recently held meetings with the Grey/Bruce Ontario Federation of Agriculture leads to discuss possible education and outreach efforts that can be implemented to increase awareness of this issue within the agricultural community. Staff also provided some background information and best management practices that are being incorporated into an article in an upcoming publication of the Rural Voice.

Some general Best Management Practices for agricultural activities in these areas are as follows:

- Conduct an assessment of your property and farm practices to counteract the potential for groundwater contamination, following OMAF guidelines.
- Use Environmental Farm Plans & Nutrient Management Plans promoting the ‘4-Rs’ best management practices.
- Ensure proper containment of manure, yard runoff, and any wash water to reduce leaching to groundwater.
- Consider the use of less intensive practices in higher risk areas, such as pasture, cover crops, reduced tillage and soil disturbance.
- Routinely clean out and inspect septic systems to ensure proper functioning.
- Conduct private well testing, as a routine practice.

Overall, local residents and new farmers to the area need to better understand the increased vulnerability of drinking water sources due to fractures in karst bedrock aquifers. Using care to consider how actions on a given property can impact water quality below the surface is key to managing risks in karst areas across the region.

RECOMMENDATION: THAT the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Committee receives Report 7b and directs staff to continue to promote Ministry Best Practices for Source Water Protection with partner municipalities and key stakeholder groups.

Respectfully submitted,



Carl Seider
Project Manager
Drinking Water Source Protection