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January 15, 2013

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Grand River Environmental Network (GREN)
Comments on Proposed Source Water Protection Plan, Dec. 16, 2012

Dear Mr. Keller,

Thank you for the opportunity to comment on the above Plan. We appreciate the depth and breadth of the work required for this massive undertaking to protect our precious water resources and look forward to continued involvement as the plan is implemented. GREN's three general comments are more fully elaborated below.

General Comments

- A. The introduction to the report acknowledges the need "to protect current and future sources of drinking water" (Exec-i), yet the Plan fails to assess additional drinking water sources that may be needed by the community;
- B. The Plan falls short on assessing future threats, new threats or escalated threats that would necessitate additional sources of drinking water; and
- C. Some recommendations are inadequate to protect drinking water resources due to weak language.

A: Future drinking water sources

Lake Erie

The report says that "no Great Lake Policies will be included in the Grand River Source Protection Plan at this time" (6-5) despite the fact that the previous paragraph, discussing the Great Lakes Water Quality Agreement, says "the Grand River watershed drains directly into Lake Erie and has the potential to contribute pollutants to the lake" (6-5). This statement is misleading. The Grand River is already one of the largest sources of phosphorus to Lake Erie, creating a plume that extends 12 km down the coast and 3 km offshore.¹ These phosphorus discharges are resulting in increasing blue-green algae growth in Lake Erie, "natural toxins that are dangerous to humans and wildlife".²

¹ Lake Erie Binational Nutrient Management Strategy, 2011, pg. 10

² Ibid, pg. 8

It is a serious failure of this plan to not include protection of Lake Erie, since some municipalities along the Grand River, including Waterloo Region, identify it as a potential major source of drinking water.

Focus on current “intake protection zones” only

No source water protection plan is failsafe. Having already experienced spectacular disasters in Elmira and Cambridge, it is critical that all potential future sources of drinking water be designated as “significant”. The Plan should include aggressive protective actions for all recharge areas where the water is of a quality to be used as a drinking water supply, all potential intake areas in Lake Erie, closed well-fields that could be brought back into use in the future, and potential new well fields.

B: Threats to Drinking Water Sources

The Clean Water Act identifies 19 drinking water quality threats and two drinking water quantity threats (6-2). Some of these are defined too strictly, others not included at all. We are concerned that items, referred to as “optional content” (6-4), have been dropped from this plan and recommend their re-inclusion.

Threats to recharge not addressed

The report says that concerns about “an activity that reduces the recharge of an aquifer” are only an issue in the Townships of Amaranth and East Garafraxa (6-3). Significant barriers also exist in highly developed urban areas. Although the draft Plan recognizes that certain types of potentially contaminating facilities should not be allowed in these recharge areas, it does not address the quantity aspect. Requirements to reduce impervious surfaces and diversion of water into storm sewers for each existing recharge area should be included.

Other threats not addressed

This plan fails to include risks GREN identified in our previous submission to the Committee. Although considered by the MoE to be “optional content,” they substantially weaken the ability of the plan to protect our drinking water supplies. We repeat the list here (as follows) and have appended our 2010 brief.

- Prescription drugs, household chemicals, hormonally active substances
- Excavation activities, especially aggregate extraction
- Abandoned private wells that have not been properly sealed
- Abandoned and existing service stations with inadequate underground storage tanks
- No longer in use hazardous waste sites and brownfields
- Residential, institutional, and commercial treatment of their lawns
- Golf courses
- Dumping of industrial chemicals into municipal sewers
- Air sources of contamination
- Contaminated sites with industrial facilities still operating
- Climate change

C: Weakening of otherwise good action items

Included below are examples of weak language that cripple good action items. Words such as “request” and “encourage” should be replaced with “require” in the action plans for all municipalities.

- *Requirement to change the municipalities’ official plans to reflect the Source Protection Plan apply only where there is a “significant threat” (9-4). Official plans should also require incorporating changes to address threats designated as of lesser significance.*

- *If complete applications for a site plan, environmental compliance approval, or building permit have been received before the Source Protection Plan provisions come into effect, the “significant threat activity” shall be permitted (9-5). The problems created by past inappropriate development should not be compounded by allowing further exemptions.*
- *“Encourages” notification of the local source water protection authority of proposals for new underground oil pipelines in “vulnerable areas” (9-6). Change to “require” and do not allow new or expanded underground pipelines in “vulnerable areas”.*
- *Within five years, municipalities will be “requested” to include locations of wellhead protection areas into their Emergency Response Plans (9-8). Again, change to “required” and tighten up the deadline.*

There are more, but these should serve as representative examples.

Again, thank you for this opportunity to comment. We will continue to support you in strengthening and implementing the Plan and in anticipating future threats.

Sincerely,



John Jackson
Chair
Grand River Environmental Network

Attached:

APPENDIX A: Grand River Environmental Network Comments on Proposed Assessment Report: Grand River Source Protection Area, November 4, 2010

APPENDIX A

December 6, 2010

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Grand River Environmental Network Comments on Proposed Assessment Report: Grand River Source Protection Area, November 4, 2010

Dear Mr. Keller,

Thank you for the opportunity to comment on the above report. We are pleased with the very thorough nature of this study and look forward to participating in your future discussions around how to protect the precious water resources in Waterloo Region.

There are, however, a few areas that we think should be either clarified or improved.

(A) General Comments

1. The Urgent Need for a Strong Action Plan

The staggering total of approximately 2,500 “activities” that “may be significant threats” to water sources that are listed in this report as being “highly to moderately vulnerable to contamination” in Waterloo Region proves the need for the development of strong protection and prevention plans. In fact, we have probably understated the extent of the problem because, in some instances, the study did not break down the activities thoroughly enough to be able to distinguish between low vulnerability and medium to high vulnerability areas. In those cases we have made adjustments in our assessment, which probably results in an understatement of the threatening activities in medium to high vulnerability areas. This means that the total number of activities that are significant threats is probably higher than 2,500.

2. Weak on Long-term Prevention

Although the study appropriately takes into account the impacts that projected growth in the Region could have on water quantity pressures, it does not look at the pressures that growth in the Region will create for water contamination problems. A proper protective and preventative plan will anticipate and incorporate potential water quality problems created by increased growth projections. This plan should include not only current drinking water sources in the Region, but potential future water sources and threats to them, as well as pointing out the need for plans to protect these new sources.

We are pleased to see the excellent summary, in Chapter 18, of the predicted impacts of climate change on water quantity and quality in the Grand River and Lake Erie watershed, particularly the inclusion of predicted impacts of climate change in your “water *quantity* stress assessments” in the next phase of the study. Climate change impacts, however, should also be included in your water *quality* assessments.

3. Emerging Threats

Only current threats with already established standards are included in this report. This is a major problem with the study and must be corrected. Major emerging threats to our drinking water include

the synergistic, chronic, low-levels of excreted and improperly disposed-of prescription drugs, household chemicals, hormonally active substances and more.

4. Inclusion of Excavation Activities as a Threat

We strongly support the inclusion of excavation activities, in particular the large increase in aggregate extraction, as threats that may affect drinking water sources. On Page 20-4 of the study, the authors state that “areas of high aquifer vulnerability are roughly coincident with the gravel terraces within the Horseshoe Moraine and Waterloo Hills regions, the Flamborough Bedrock Plain and the Norfolk Sand Plain.” Since these are significant water supply sources this study will be seriously deficient if the impact of excavation activities is not included.

As the Province has stated the lack of inclusion because “the solutions have not been developed at this stage”, we encourage a moratorium on developments of this nature in areas that can impact drinking water sources to prevent irreparable harm. Exploration of how to address this problem where the uses are already there needs more exploration.

5. Vulnerability Definition and Criteria (section 1.8)

A source water protection scheme for drinking water is only as good as its definition of vulnerability.

Vulnerability, as defined in this report, is based upon looking at a spill or leak from a contamination source into the water source and determining how quickly the water moves from that spot to the drinking water intake. This system works fine to avoid a disaster such as what happened in Walkerton. It does not, however, provide for protection of the water supply from the gradual leaking of pollutants into the aquifer that will build up over time to a level that makes the aquifer no longer fit to be a drinking water source. For example, Elmira was not taken off its drinking water source because there was a sudden spill from the chemical plants that suddenly contaminated the water source. It was a build up of on-going contamination over time that destroyed that aquifer. Likewise, contamination is gradually building up in aquifers as a result of increasing salinity.

We find the following statement to be strange, “Activities and conditions that are or would be drinking water threats in Highly Vulnerable Aquifer areas cannot be significant threats, given that the vulnerability score is 6.” (Page 4-16). It, in effect, says that because it is defined as a highly vulnerable area, it cannot by definition have threats in it. A similar statement is made regarding significant recharge areas. This is not reassuring. We need an explanation for this statement since it is central to the whole report.

6. Possible Discrepancies between Waterloo Region’s Water Quality Reports and this Report

On Page 9-408, the statement “All water quality *Issues* were previously known to Region staff.” raises concerns as Waterloo Region’s Annual Water Quality Reports indicate that no standardsⁱ for chemical or biological pollutants have been breached yet this Proposed Assessment Report identifies increased levels of nitrates in Mannheim wells. Which report is correct?

7. The Capability to Expect the Unexpected

Vital routine tasks such as water monitoring to protect water quality and our health must be taken very seriously. New findings in industrial psychologyⁱⁱ indicate that we see only what we expect to see or are looking to find. What safeguards are in place to address this narrowed focus to protect our drinking water?

8. Lack of Clarity on Whether Serviced Residential and Vacant Properties are Included

On Page 9-33, the report states in red, “Removed sentence on the “The total properties...do not include serviced residential and vacant properties...” Does this mean that serviced residential and vacant properties have been put into this revised version of the Proposed Assessment Report? If these have

not been included, GREN has serious concerns for reasons more fully explored below in section (B) Issues and Threats. Please clarify.

9. Enforcement of Standards

Regulations are only as good as their enforcement. The protection plan that will be developed in the next phase should include a detailed enforcement plan.

(B) Issues and Threats

The Province and the Clean Water Act have identified *Issues* and potential threats to the watershed. GREN believes there are a number of issues or threats that are being overlooked.

1. Identification and Improper Decommissioning of Abandoned Private Wells

Improperly decommissioned and abandoned wells can serve as conduits for pollutants to enter the aquifer. Before accurate record-keeping began, private wells were dug and abandoned and, in many cases, insufficiently or improperly decommissioned. Their locations are not always clearly identified. The same is true for businesses before municipal water supplies were available. What measures are in place to identify and properly decommission wells that have been or will be abandoned? These should be included in the Drinking Water Source Protection Work.

2. Abandoned and Existing Gas Stations with Older Underground Tanks

Old and abandoned underground gas tanks will leak. As redevelopment continues, many are being retrofitted with state-of-the-art safe tanks that are monitored, but a number of them have already contaminated the groundwater in the upper aquifer, especially under Old King Street East near Hwy. 401 in the Pinegrove Community in Kitchener. The threats in this report should include a survey of old or abandoned gas tanks that have not been removed and ones that have been removed, but not properly cleaned up.

3. Proximity of Contamination to Private Wells

The above-mentioned gasoline plume under King East is a potential threat to private wells. There is no knowledge of what is happening underground, so residents are concerned about whether the plume is entering the aquifer and/or is working its way into the Grand River and potentially polluting downstream in Cambridge. Information about this plume is not easily accessible to citizens because it is from privately owned gas stations.

4. Abandoned Hazardous Waste Sites and Brownfields

With Waterloo Region's industrial past, abandoned and unidentified hazardous waste sites and brownfields are a reality and potential groundwater threat. The federal government has identified 9,292 hazardous waste sites and, "An additional 3,772 sites were identified in the provinces of Ontario and Quebec. The total number is expected to grow as further effort is directed towards finding as yet unidentified sites." ⁱⁱⁱ

Within Waterloo Region, the Ministry of the Environment, Brownfields Environmental Site Registry^{iv} currently has a listing of 40 properties in a 5 km radius in Kitchener alone, any of which can pose a threat to drinking water. What work is being done to identify and address these concerns and deal with additional, unexpected problems?

5. Water Softeners

The Region's hard water is well known and water softeners are commonly used. "On average, a single residential self-regenerating water softener can discharge a pound of salt per day and between 70 to 300 gallons of water per week when it regenerates and "flushes" away the brine." ^v

Despite the statement below, on the Region of Waterloo’s website, we have concerns that water softener salt is contributing to the increased salinity and chloride levels in our surface and groundwater.

“The salt brine created from water softeners is discharged into the sanitary sewer system which runs beneath the road ways. The sewers carry the brine to the wastewater treatment plants where the water is treated and discharged into the Grand River. Throughout the sewer system the salt brine does not leak out of the pipes into the ground. In fact, it is reported that due to the high water table groundwater seeps into the pipes. This means that water softener salt can be ruled out as a source of the increasing chloride levels in our groundwater.”

Other communities, such as Hamburg, Minnesota, do not share the Region of Waterloo’s view that water softeners are not a source of increasing saline and chloride levels.

“Several Wastewater Treatment Plants permitted to discharge their treated wastewater to the ground by the WMD have been found to have excessively high levels of sodium and chloride in both their treated wastewater and in the groundwater adjacent to their discharge site. Once discharged to the ground, there is very little natural treatment or uptake by plants or other organisms and minimal soil adsorption of the sodium or chloride. Sampling results at several discharge sites have found that sodium and chloride levels in the adjacent groundwater greatly exceed federal drinking water limits. The maximum allowable level for sodium in groundwater is 120 m/l and for chloride 250 m/l. Samples of groundwater taken at affected facilities have often resulted in finding levels more than double allowable levels of both sodium and chloride.”^{vi}

What is the evidence in Waterloo Region to support the position that the increasing salinity and chloride in our groundwater are NOT due in part from the discharge from water softeners?

6. Hidden Valley Water Intake

We have serious concerns about the field reports and conclusions for the Hidden Valley water intake area. In particular, we note the following:

- Making the reservoir area above the Hidden Valley weir into a Type C category which will reduce the size of the IPZ-1 zone. Page 9–21

Hidden Valley natural area consists of a large ESPA, three PSW’s and about 85 acres of open field. The current, but outdated, zoning allows for a combination of heavy industry, light industry, business park and residential development. Any contaminants such as road salt runoff, parking lot residue from cars and heavy trucks, roof runoff from either asphalt or tar roofs and industrial accident chemicals and contaminants from the residential units and business park would enter the PSW’s and then the Grand River. This is a potentially significant risk as the PSW’s outflow to the Grand River is 250 meters up river from the intake pipe for 22% of the Region of Waterloo’s water supply.

To bullet #3 on Page 9-408, we recommend the following changes (italicized): *Under Existing Conditions* No Significant Threat Conditions or Issues were detected for the Hidden Valley Surface Water Intake. *If development takes place as allowed by current, but outdated, City of Kitchener zoning regulations, then a Tier 3 study will be required to determine if there will be an increased threat to the surface water supply.*

- On Page 20-26 in the Conclusion Chapter, we recommend the following changes (italicized): The water quality threats assessment shows, *that under current field conditions* no significant threats were identified for the Hidden Valley intake. *If development takes place, as allowed by current, but outdated, City of Kitchener zoning regulations, then a Tier 3 study will be required to determine if there will be an increased threat to the surface water supply*”.
- We recommend the removal of bullet #2 on Page 9-407. Allowing an extra 48 hours for contaminants to enter the surface intake system because the water will be stored in a large reservoir does not take into account two important factors:
 - If the tanks and pipes are contaminated, there would be a substantial cost to pumping the tanks dry and then cleaning the tanks before using them again
 - When the water from the contaminated tanks is pumped back into the river, the Region of Waterloo would be creating a problem for each of the communities downstream that draw water from the Grand.
- Contributing drainage areas identified as rural were considered to have a reduced potential for generating runoff versus urbanized catchments. The velocities of runoff associated with rural drainage areas (natural transport pathways) are slower and include more filtration potential than that of urbanized catchments (anthropogenic transport pathways). Therefore, a higher incidence of anthropogenic transport pathways upstream of the intake results in a higher area vulnerability factor.
- The final vulnerability scores for the Hidden Valley IPZ-3 also took into consideration the inherent detention (not to mention dilution) benefits provided by reservoirs found in the watershed (Belwood Lake (Shand Dam) and Conestoga Lake (Conestoga Dam), which significantly increased the travel time from contaminant contribution locations to the intake. The argument on Pg 9-28 is an example of “dilution is the solution to pollution” mentality that should be reconsidered.

7. Excavation, Toxics-Bearing Pipelines and Roads Threats

We reiterate our support of the GRCA recommendation that the MoE include excavation as a threat to groundwater security. More controls are needed to prevent both loss of water and the introduction of pollutants such as road salt and the toxic contents of pipelines, notorious for leaking into groundwater. For example, during the road widening of Sportsworld and Maplegrove Drive, the aquifer was hit, water was lost and the aquifer was left vulnerable to pollution. What safeguards are in place to prevent construction that goes below the water table?

The mandated population growth also raises new challenges. Population growth parallels increased aggregate excavation – some on lands owned or controlled by the GRCA.

8. Residential Lawns (Page 9-33)

It is puzzling that residential and commercial lawns are “Not included as part of the non-agricultural managed land because they likely do not represent a significant nutrient loading to municipal aquifers.”

The Ministry of Environment report (released in 2009) *Evaluating the Success of Ontario’s Cosmetics Pesticides Ban Preliminary Results - 2008-2009 Urban Stream Water Quality Study* found:

“Preliminary results show a significant drop in concentrations of 86, 82 and 78 per cent in three pesticides commonly used in lawn care products.”^{vii} Previous estimates indicate that these three herbicides accounted for over half the total amount of pesticides used by lawn care companies in Ontario.”

Schneider Creek was included in that study. If the now-banned lawn pesticides, commonly used in combination with fertilizer (eg. weed n feed type) were found in surface water, we can expect that the not-banned lawn fertilizers on their own are of concern. Consider the following calculations:

- The Seedland website ^{viii} states that the average bluegrass lawn requires 3 lbs. of nitrogen per 1000 sq. ft.
- An average building lot size in KW is about 50'X 100', or 5000 sq. ft. If the house & driveway covers 40% of that, the remaining 60% which is landscaped would be about 3000 sq. ft., and would require 9 pounds of nitrogen fertilizer a year.
- If the homeowner purchases fertilizer with a 25-4-6 composition, then 25 % of the bag is nitrogen. Thus, to actually put 9 pounds of nitrogen on a 3000sq. ft. lawn, 36 pounds of fertilizer must be used.
- If there are about 100,000 home owners in Waterloo Region, and 60% to 70% of them fertilize their private lawns, then the quantity of nitrogen released by residential users would be between 540,000 and 630,000 pounds, or 270 and 315 tons.

The impact of approximately 300 tons of nitrogen is not insignificant and should be included in this GRCA Report. Similar calculations can be done for other lawn chemicals, and for farm properties and golf courses.

9. Golf Courses

Golf courses have encroached on floodplains, and have created an “unnatural” environment that is maintained with both pesticides and fertilizers. Much of the pesticide use is on low land and flows directly into the Grand River. Most other golf courses are traversed by streams that discharge into more major water bodies. Therefore, golf courses should be included as a threat to drinking water sources.

10. Improper Dumping of Industrial Chemicals

Many industries dump hazardous materials/chemicals into the municipal sewage system. The municipal sewage treatment plants are not designed to destroy these kinds of chemicals therefore they are released into the surface water system which becomes part of our water supply and that of communities downstream.

11. Air Transport and Fallout of Toxics

The long-distance transport of toxics through the air to land and back, often called the “grasshopper” effect, is well recognized. From the Great Lakes “exhaling” toxics, to the worrisome levels of 2,4-D found in Alberta’s rainfall to the increased mercury levels in the Arctic, no ecosystem is immune from the air transport of toxic substances where both land and water can be adversely affected.

It is a reminder that there is no such place as “away”. The good news is that reduced emissions have a measurable impact. In the Ohio River Valley, for example, when large reductions in sulphur dioxide emissions were implemented, a significant drop in sulphate deposition was measured downwind in the highly sensitive Adirondacks and New England. ^{ix}

(D) Conclusion

Again, thank you for the opportunity to comment. We strongly encourage all measures to protect our most valuable resource, water. We are at your disposal for further discussion.

Sincerely,



John Jackson

Chair

Grand River Environmental Network

This submission has been compiled and researched by GREN members Susan Bryant, John Jackson, Susan Koswan, Robert McColl, Bob McNicol, Greg Michalenko, Daphne Nicholls and Gord Nicholls

Endnotes

ⁱ Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen).

www.ene.gov.on.ca/envision/gp/4449e01.pdf Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines

ⁱⁱ The Invisible Gorilla, Christopher Chabris & Daniel Simons, www.theinvisiblegorilla.com

ⁱⁱⁱ International Technologies for Hazardous Waste Site Cleanup, Nunno, Thomas et al, Pollution Technology Review No. 183 1990© pg. 27
http://books.google.ca/books?id=z_NcCH031DAC&pg=PA27&lpg=PA27&dq=unidentified+hazardous+waste+sites+Ontario&source=bl&ots=J9OXUlgG6Z&sig=UR6rhgSnRKwb-yRYn457-10TEks&hl=en&ei=pkT5TOF2DJKvngfwsJSgCQ&sa=X&oi=book_result&ct=result&resnum=4&ved=0CDEQ6AEwAw#v=onepage&q=unidentified%20hazardous%20waste%20sites%20Ontario&f=false

^{iv} <http://www.vironet.ene.gov.on.ca/besr-public/gisSearch.do?action=redisplay>

^v <http://www.socalsalinity.org/pdfs/SCSCFactSheetonSalinityandWaterSoftenersAugust2009.pdf>

^{vi} <http://www.hamburg.mi.us/SODIUM%20CHLORIDE%20ISSUES/pdfs/deq-wmd-gwp-SodiumChlorideWaterSofteners.pdf>

^{vii} 2,4-D dropped by 86 per cent; dicamba by 82 per cent and MCPP (2-methyl-4-chlorophenoxyacetic acid) by 78 per cent.

^{viii} <http://www.lawnfertilizers.com/info/lawnrates.html#ANNUAL%20RATES>

^{ix} http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/2003_07_02_airdeposition_airdep_sept_final.pdf pg 6