

# **ISSUES EVALUATIONS**

## **Durham Region**

### **Hamilton Twp./Havelock**

**Trent Conservation Coalition**  
**Source Protection Region**

**Presentation to:**

**TCC – Source Protection Committee**  
**September 15, 2009**

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# PRESENTATION OVERVIEW

- 1) Issues Evaluation Process
- 2) Durham Region
- 3) Hamilton Township
- 4) Havelock
- 5) Summary

# APPROACH

## Groundwater Vulnerability Analysis Municipal Water Supplies (Part IV, Part V, Part VII)

### Delineate Wellhead Protection Areas (Part V.3 Rules 47-50):

- WHPA - A: < 100 m radius
- WHPA - B: < 2 Year Time of Travel (TOT)
- WHPA - C: < 5 Year TOT
- WHPA - C1: < 10 Year TOT
- WHPA - D: < 25 Year TOT
- WHPA - E: IPZ 2 for GUDI System
- WHPA - F: IPZ 3 where WHPA-E and Issue (Rule 114)

### Assess Aquifer Vulnerability: (Part IV.1 Rules 37-38) [Low; Medium; High]

### Increase Vulnerability for Transport Pathways: (Part IV.1 Rules 39-41) [Gravel Pits, Utilities, Wells] [Medium to High; Low to Medium]

### Assign Vulnerability Score {A} (0-10): Part VII.3 Rules 82-85 [Score 0-10 combining Vulnerability and WHPA]

### Assign Uncertainty for Vulnerability Score: (Part I.4 Rules 13-15) [High; Low]

## Issues Evaluation & Threats Assessment Municipal Water Supplies Part XI

### Identify Drinking Water Issues: Part XI.1 Rule 114 (1) and (2)

- Exceed ODWQS Schedule 1,2,3 or AO and OG (Table 4)
- Increasing Trends

### Describe Drinking Water Issues: Part XI.1 Rule 115

- Pathogen or Parameter
- Name of Well
- Contributing Area in WHPA
- Contributing Activities or Conditions

### Conduct Inventory / Compile Activity/Condition Databases:

- Obtain Existing Databases
- Conduct Visual Confirmation
- Assign NAICS Code
- Identify Key Fields for Threat Assessment (ie. NAICS Code)

### List Drinking Water Threats – Activities: Part XI.2 Rule 118 - 125

- Prescribed Threats as per Table
- Other Activities: at direction of Source Protection Committee/Director

### List Drinking Water Threats – Conditions:

- Part XI.3 Rule 126
- (1) Presence of NAPL
- (2) Presence of DNAPL
- (3) Presence of Contaminant > Potable Standard in Table 2 Soil, Groundwater and Sediment Standards

### Determine Hazard Rating {B} (0-10)

### Determine Risk Score (0 – 100)

$$\{A\} \text{ Vulnerability Score (0-10)} \times \{B\} \text{ Hazard Rating (0-10)} = \text{Risk Score RS (0-100)}$$

Negligible Threat  
(RS <40)

Low Threat  
(40 < RS >59)

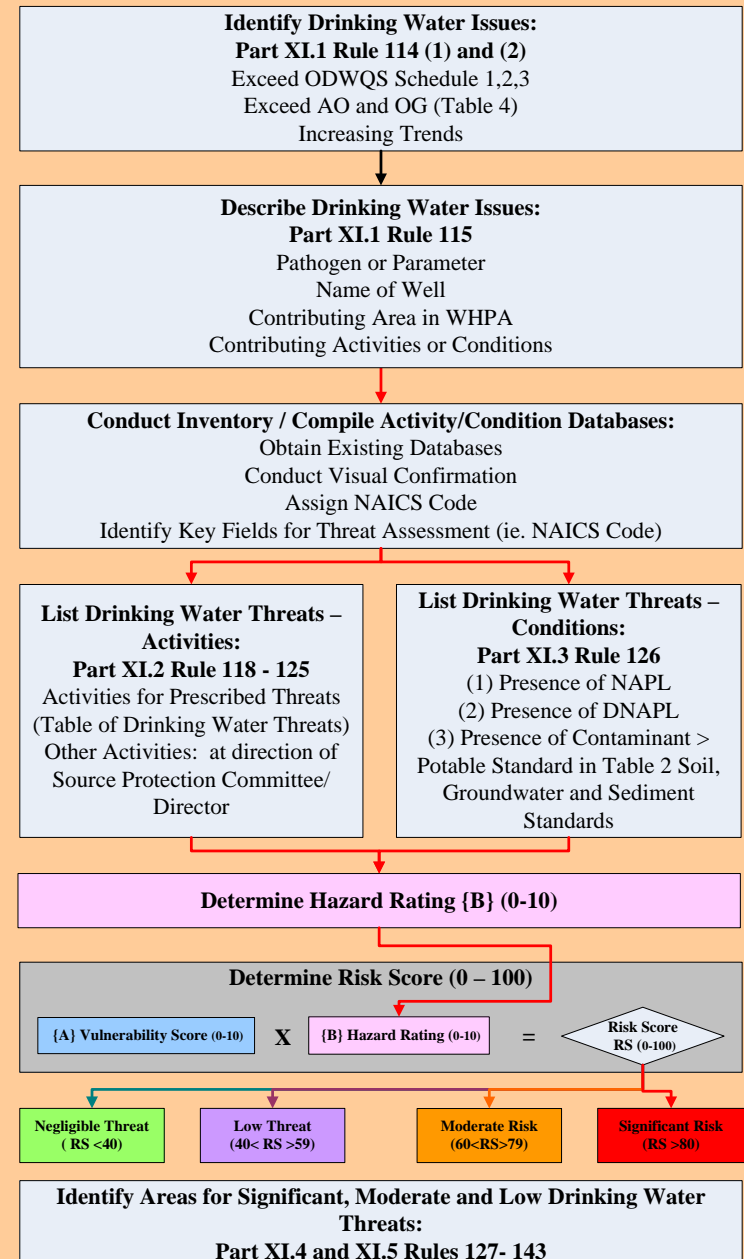
Moderate Threat  
(60 < RS >79)

Significant Threat  
(RS >80)

### Identify Areas for Significant, Moderate and Low Drinking Water Threats: Part XI.4 and XI.5 Rules 127- 143

# Threat Assessment for Prescribed Threats to Use “*Table of Drinking Water Threats*” to classify as Significant, Moderate, or Low

## Issues Evaluation & Threats Assessment Municipal Water Supplies Part XI



# ISSUES EVALUATION PROCESS

- ② **Step 1:** Assemble Available Data
- ② **Step 2:** Review Data and Identify Potential Drinking Water Issues
- ② **Step 3:** Evaluate Potential Drinking Water Issues
- ② **Step 4:** Identify Contributing Area for Drinking Water Issues
- ② **Step 5:** Prepare List of Drinking Water Issues

# Step 1: Assemble Available Data

- ② Municipal Water Supply Water Quality Data
- ② Annual Water Supply Water Quality Monitoring Reports
- ② Sentry Well Monitoring Reports
- ② Municipal Groundwater Study Reports
- ② Watershed Characterization Reports

# Step 1: Assemble Available Data

- ② Microbial Control Plans
- ② Water Supply System Engineers' Reports
- ② Permit to Take Water Applications and Technical Reports

# Step 2: Review Data and Identify Preliminary Drinking Water Issues

- ② Develop List of Preliminary Issues:
  - Concentrations > ODWQS (MAC most important; Aesthetic/Operational less important)
  - Concentrations > Background
  - Concentrations > Detection (Non-naturally occurring)
- ② Assess Reliability of Data (Frequency, consistency)
- ② Review Data for Trends:
  - Exceed ODWQS within 50 years



# Step 3: Evaluate Potential Drinking Water Issues

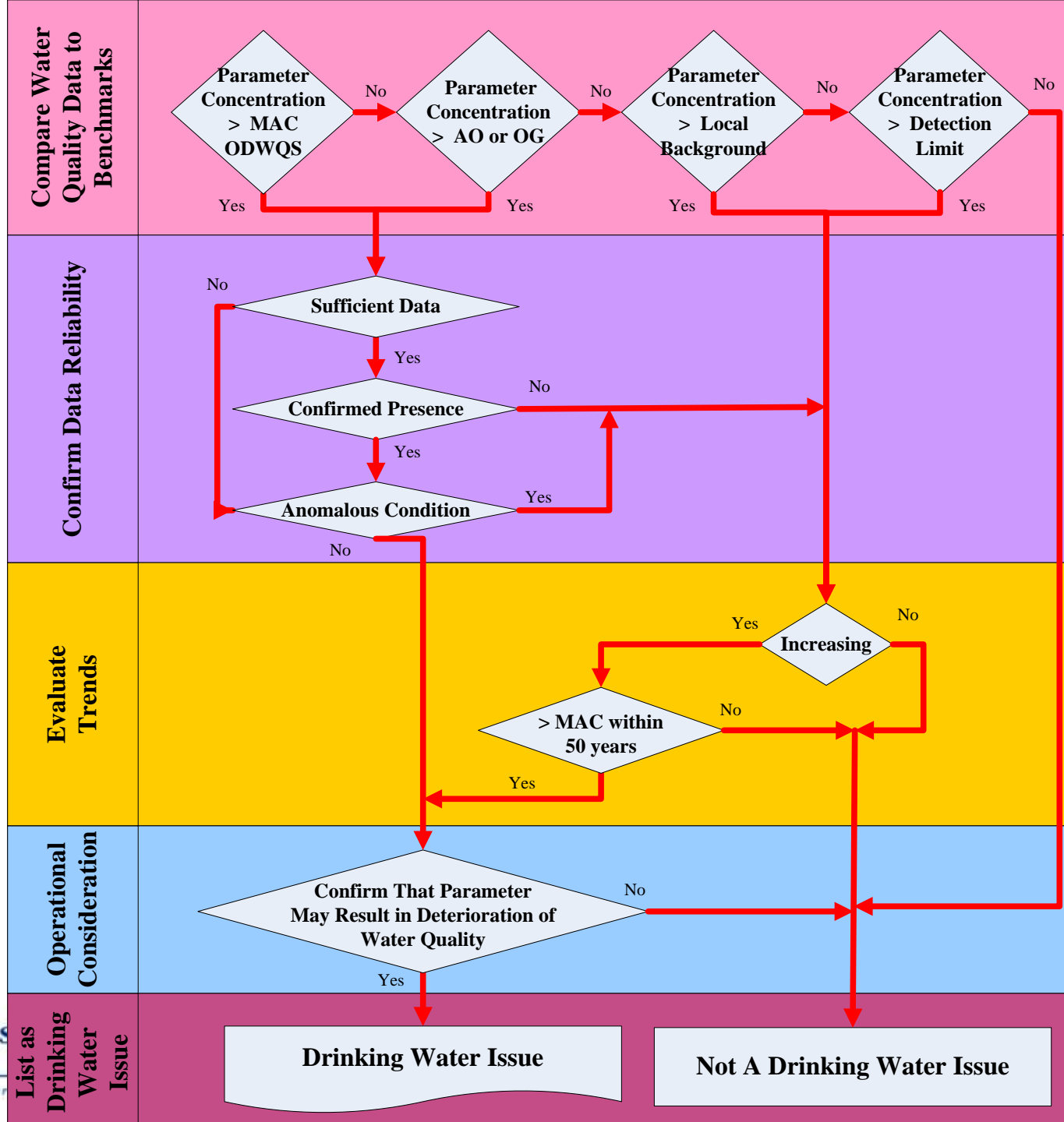
- ④ Apply Decision Flow Chart to evaluate whether potential issue should be considered a Drinking Water Issue

# Step 3: Evaluate Drinking Water Issues

Ⓢ Not a Drinking Water Issue if:

- Not likely to deteriorate the water for use as a source of drinking water.
- Parameter is naturally-occurring
- Effective Treatment is in place
- Concentrations will not exceed treatment capacity.
- Parameter formed as disinfection by-product

# ISSUES



# Aesthetic Objective – Naturally Occurring

- @ Chloride
- @ Copper
- @ Dissolved Organic Carbon
- @ Iron
- @ Manganese
- @ Methane
- @ Odour
- @ Sodium
- @ Sodium
- @ Sulphate
- @ Sulphide
- @ Taste
- @ Temperature
- @ Total Dissolved Solids
- @ Turbidity
- @ Zinc

# Operational Guideline – Naturally Occurring

- @ Alkalinity
- @ Aluminum
- @ Hardness
- @ Heterotrophic Plate Count
- @ Organic Nitrogen
- @ pH
- @ Turbidity

# Aesthetic Objectie - Anthropogenic

- Ⓜ 1,2-Dichlorobenzene
- Ⓜ 1,4-Dichlorobenzene
- Ⓜ 2,4-Dichlorophenol
- Ⓜ 2,3,4,6-Tetrachlorophenol
- Ⓜ 2,4,6-Triphenol
- Ⓜ 2,4,5-Trichlorophenoxy acetic acid
- Ⓜ Ethylbenzene
- Ⓜ Monochlorobenzene
- Ⓜ Pentachlorophenol
- Ⓜ Toluene
- Ⓜ Xylenes

# Most Commonly Excluded

- Ⓢ Occasional coliform bacteria (anomalous)
- Ⓢ Occasional occurrences (anomalous)
- Ⓢ Sodium – greater than 20 mg/L but less than 200 mg/L
- Ⓢ Disinfection By-products (Trihalomethanes)

## Step 4: Identifying Contributing Area for Drinking Water Issues

- ② Where possible – identify contributing area
- ② Activities that use “Issue Parameter” will be significant drinking water threats

# Step 5: Prepare List of Drinking Water Issues

- ② Final list prepared based on the evaluation via Table A4-1
- ② Very few Drinking Water Issues identified

# ISSUES EVALUATIONS

## Durham Region

### Ganaraska Conservation

④ Orono

### Kawartha Conservation

④ Blackstock

④ Greenbank

④ Port Perry

# Potential Issues Not Considered Orono

- ② Coliform – anomalous
- ② Chloride, Sodium - trends not projected to exceed ODWQS in the next 50 years
- ② Organic parameters – trace concentrations
- ② Colour, TDS, DOC, hardness – naturally-occurring

# Drinking Water Issues Orono

⊕ No Drinking Water Issues Identified

# Municipal Wells - Blackstock

<b>Municipal Well:</b>	<b>MW1</b>	<b>MW7</b>	<b>MW8</b>
<b>Constructed:</b>	1971	1996	1999
<b>Depth (m):</b>	28.04	58.82	51.51
<b>Maximum Rate (L/s):</b>	4.56	11.59	11.59
<b>Static Water Level (m below pipe):</b>	8.03	4.62	4.45

# Potential Issues Not Considered Blackstock (MW1)

- Ⓢ Coliform bacteria – anomalous
- Ⓢ Chloride – trends not projected to exceed ODWQS in the 50 years
- Ⓢ Hardness, colour, iron, manganese – naturally-occurring
- Ⓢ Total Dissolved Solids -trends not projected to exceed ODWQS in the 50 years; naturally-occurring

# Potential Issues Not Considered Blackstock

- Ⓢ Organic parameters – trace concentrations
- Ⓢ Sodium - trends not projected to exceed ODWQS in the next 50 years

# Drinking Water Issues Blackstock

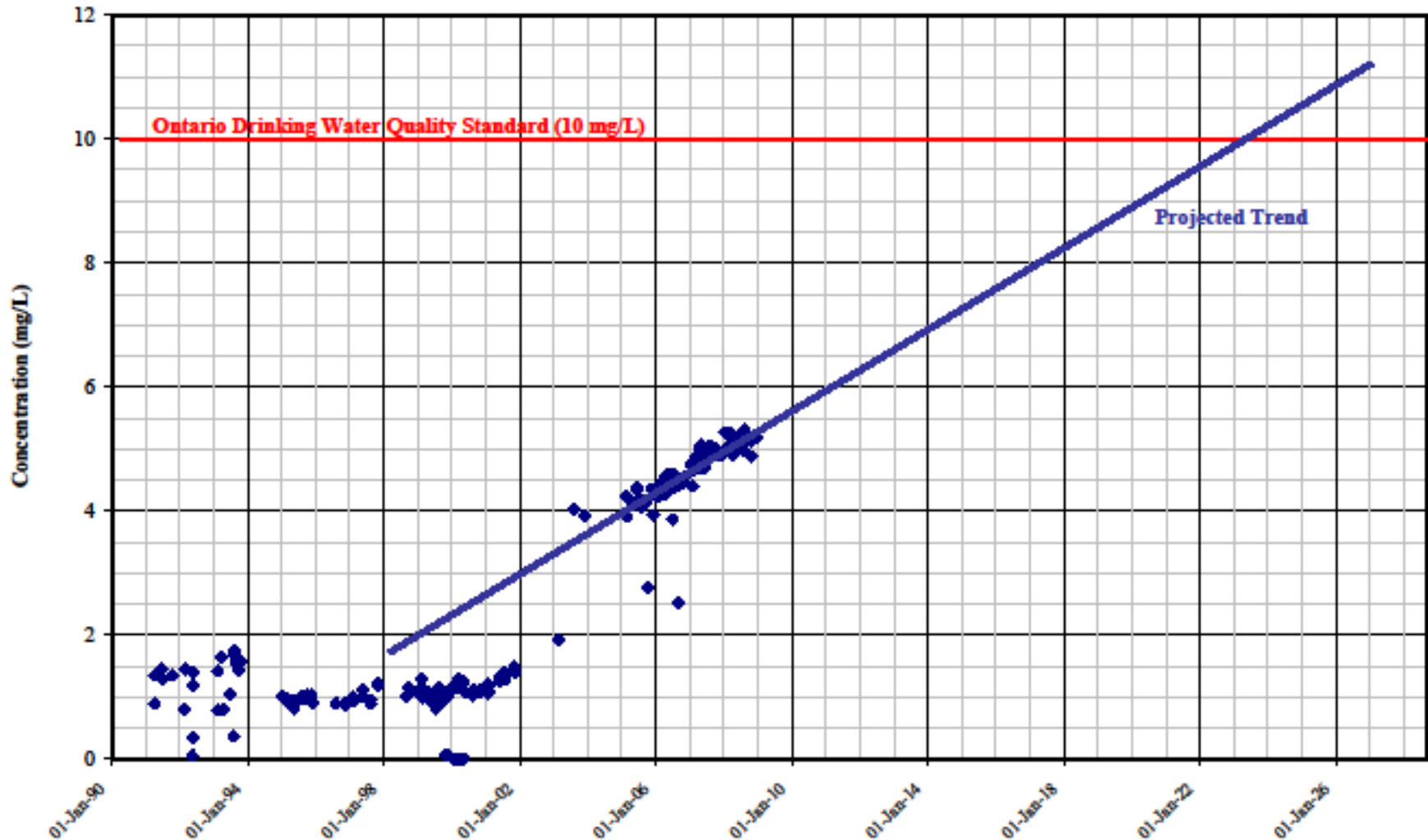
## @ Nitrate @ MW1

- Values projected to exceed ODWQS in near future
- Contributing Area = shallow capture zone (MW1)
- Activities that produce nitrate in contributing area to be considered significant drinking water threats

## @ Likely Action – replace MW1

# Graph for Nitrate Blackstock MW1

Figure E2-1. Trend Graph for Nitrate -MW1 - Blackstock Water Supply

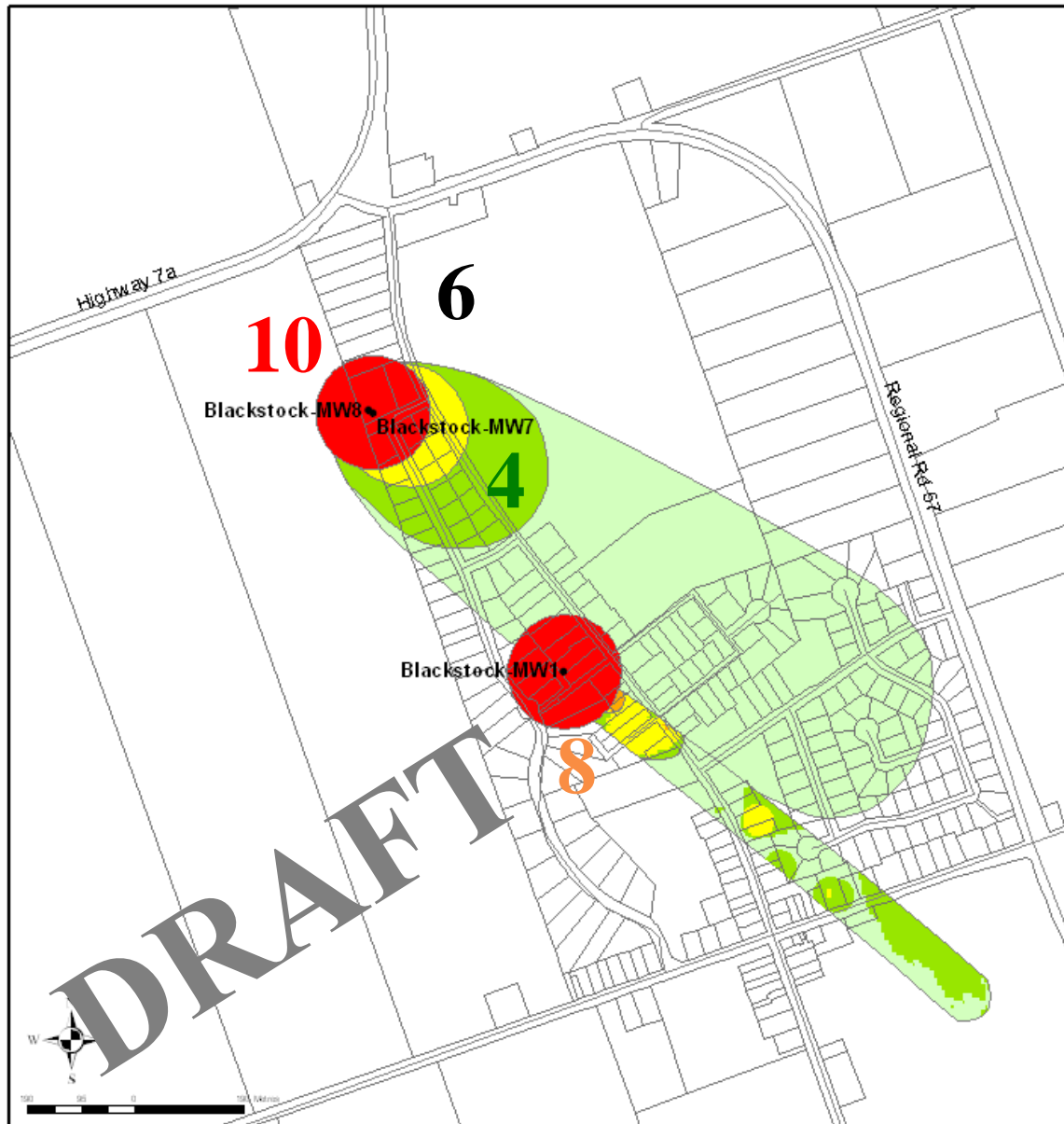


# Vulnerability Score – Blackstock

## LEGEND

- WELL LOCATIONS

## VULNERABILITY SCORING



# Potential Issues Not Considered Greenbank

- Ⓢ E. Coli, coliform – infrequent, anomalous
- Ⓢ Organic parameters – trace concentrations
- Ⓢ Colour, dissolved solids, hardness – naturally-occurring

# Potential Issues Not Considered Greenbank

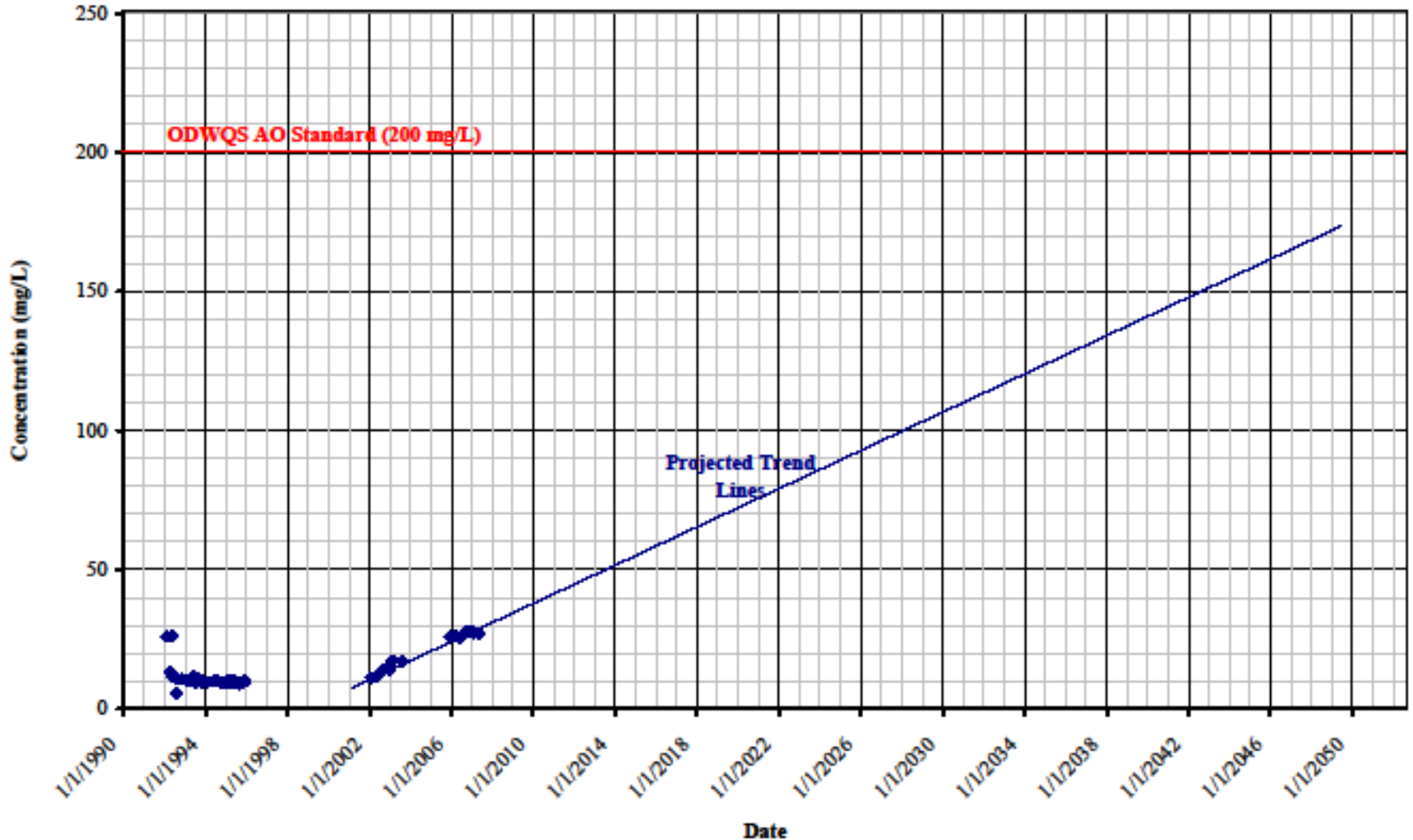
- ② Iron, Turbidity – naturally-occurring
- ② Sulphate - trends not projected to exceed ODWQS in the next 50 years, naturally-occurring
- ② Manganese - trends not projected to exceed ODWQS in the next 50 years, naturally-occurring

# Potential Issues Not Considered Greenbank

- ② Nitrate - trends not projected to exceed ODWQS in the next 50 years
- ② Sodium - trends not projected to exceed ODWQS (AO) in the next 50 years
  - MW3 – Trends changed since 2002

# Greenbank MW3 Sodium Figure

Figure F2-10 Trend Graph for Sodium - MW3 - Greenbank Water Supply



# Drinking Water Issues Greenbank

Ⓢ No Drinking Water Issues Identified

# Potential Issues Not Considered Port Perry

- Ⓢ E. Coli, coliforms – anomalous
- Ⓢ Chloride - trends not projected to exceed ODWQS in the next 50 years
- Ⓢ Hardness, colour – naturally-occurring
- Ⓢ Iron, manganese, total dissolved solids - trends not projected to exceed ODWQS in the next 50 years, naturally-occurring

# Potential Issues Not Considered Port Perry

- ② Lead – anomalous
- ② Organic parameters – trace concentrations
- ② Sodium - trends not projected to exceed ODWQS in the next 50 years

# Drinking Water Issues Port Perry

Ⓢ No Drinking Water Issues Identified

# ISSUES EVALUATIONS

## Township of Hamilton / Ganaraska Conservation

- ② Creighton Heights
- ② Camborne

# Potential Issues Not Considered Creighton Heights

- ② Coliforms – anomalous
- ② Trihalomethane, 2,4,6-trichlorophenol – trace concentration – treatment by-product
- ② Iron, manganese – naturally occurring, treatment in place
- ② Colour, hardness – naturally-occurring

# Drinking Water Issues Creighton Heights

⊗ No Drinking Water Issues Identified

# Potential Issues Not Considered Camborne

- ② Trihalomethane – treatment byproduct, trace concentrations
- ② Hardness – naturally-occurring
- ② Turbidity – naturally-occurring

# Drinking Water Issues Camborne

ⓐ No Drinking Water Issues Identified

# ISSUES EVALUATIONS

## Township of Havelock-Belmont-Methuen

### Crowe Valley Conservation

@ Havelock

# Potential Issues Not Considered Havelock

- Ⓢ E. Coli, coliform – anomalous
- Ⓢ Dissolved petroleum hydrocarbon parameters – point source mitigated, anomalous
- Ⓢ Iron – naturally-occurring

# Potential Issues Not Considered Havelock

- ② Colour – naturally-occurring
- ② Turbidity – anomalous
- ② Sodium - trends not projected to exceed ODWQS in the next 50 years
- ② Trihalomethane – trace concentrations, treatment by-product

# Drinking Water Issues Havelock

Ⓢ No Drinking Water Issues Identified

# Summary

## Drinking Water Issues

- ② Few Drinking Water Issues Identified
- ② Nitrate at MW1 in Blackstock
- ② Next Step – Threats Assessment

**Thank You**

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