

SOURCE PROTECTION PLANNING

Summary of Recommendations of the Technical
Experts Committee

Ian Smith
Ministry of Environment

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Protecting our environment.



Ontario

Today's Presentation

- Will provide an overview of what the Technical Experts Committee recommended regarding:
 - Water Budgets
 - Vulnerability Analysis
 - Issues Identification
 - Threats Inventory
 - Risk Analysisfor the purposes of source protection planning.
- Will discuss the committee's recommendations within the context of the Threats Assessment Framework that was developed

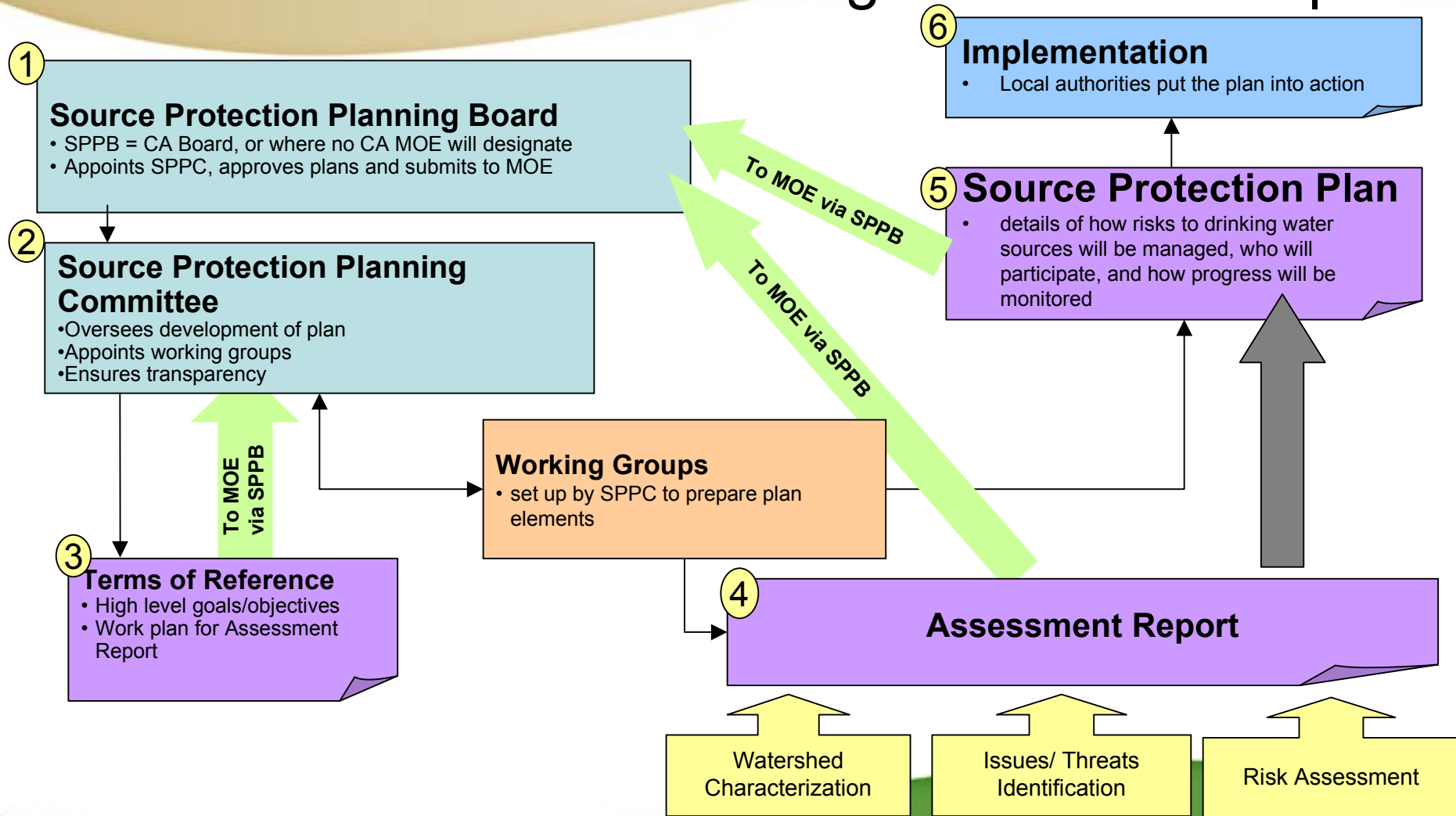


Presentation Overview

- TEC Membership & Mandate
- The Source Protection Planning “Road Map”
- Overview of TEC Report
- The Threats Assessment Process
- Summary of TEC recommendations regarding:
 - Water Budgets
 - Vulnerability Analysis
 - Issues Identification
 - Threats Inventory
 - Risk Analysis



Source Protection Planning – the Road Map



TEC Membership

Member	Affiliation
Gayle Wood, Co-Chair	Lake Simcoe and Region Conservation Authority
Jim Smith, Co-chair	Ministry of the Environment
Michael Brodsky	Consultant – Microbiology
Robert Clay	Ducks Unlimited
Marg Misek-Evans	Oxford County
Dr. John FtizGibbon	University of Guelph
Dr. Michael Goss	University of Guelph
Mayor James Hawken	City of Temiskaming Shores
Eric Hodgins	Region of Waterloo
Steve Holysh	Conservation Authorities Moraine Coalition
Dr. Douglas Joy	University of Guelph
Derrick Kamanga	Ontario First Nations Technical Services Corporation
Dr. Bruce MacDonald	Agriculture Canada (retired)
Dr. Ronald Pushchak	Ryerson University
Dr. Michel Robin	University of Ottawa
Dr. David Rudolph	University of Waterloo
Dr. David Sharpe	Geological Survey of Canada

Mandate of the Technical Experts Committee

- The Technical Experts Committee was given a mandate to make recommendations regarding the development of an Ontario-based process for assessing all threats to sources of drinking water
- Deliverable:
 - The committee was asked to deliver a report outlining its recommendations regarding the key elements of an Ontario-based threats assessment process
- Timeframe:
 - The committee commenced its meetings in January 2004, and met until the end of November, 2004
 - Report was delivered to the Minister in December

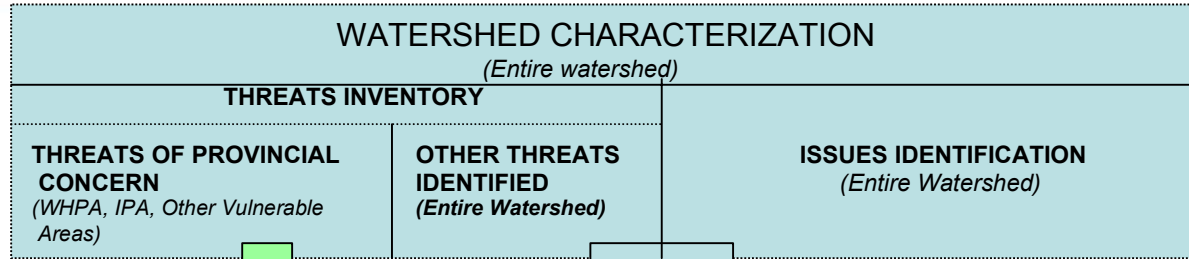


Contents of TEC's Final Report

- Report makes **recommendations** regarding :
 - **Threats Inventory and Issues Identification**
 - **Vulnerability Analysis**
 - **Risk Analysis**
 - Risk Management
 - Ecological Protection
 - Data Requirements and Management
 - Research, Data and Information Needs
 - Permits to Take Water
 - Drinking Water Protection Actions by 2008
- The committee identified **guiding principles** for the source protection planning program, covering issues such as:
 - Data and information sharing
 - The multi-barrier approach
 - Uncertainty and the precautionary approach
 - Importance of ongoing research

Threats Assessment Framework

RISK IDENTIFICATION



RISK ANALYSIS

RISK ASSESSMENT

Collection of additional information, and reanalysis where needed

RISK CATEGORY



NEGLECTIBLE RISK* – no further action required

Significant Risks

Moderate Risk

Low Risk

Progress by 2008

RISK MANAGEMENT & PRIORITY SETTING

MANDATORY RISK REDUCTION

RM ACTION: SUBSTANTIALLY REDUCE THE RISK

RM Actions must significantly reduce the risk posed to drinking water

RISKS TO BE MANAGED

RM ACTION: DO NOT PERMIT RISK TO INCREASE & REDUCE RISK WHERE FEASIBLE

Risks need to be 'actively managed' to ensure that they do not become "Significant risks"

RISKS TO BE MONITORED

RM ACTION: PREVENT DEGRADATION AND REDUCE RISK WHERE FEASIBLE

Risks not requiring mitigation are monitored

*Threats of Provincial Concern can not be discarded as Negligible Risk

Risk Identification

- The first step in the Threats Assessment Framework is collectively termed “Risk Identification”
- It includes Watershed Characterization, a Threats Inventory, and Issues Identification
 - Watershed Characterization contains four major sub-elements – watershed description, water budgets, water quality conditions, and protection area delineation
- *Water budgets* identify water resources, compare uses, and withdrawals to identify where cumulative water withdrawals, current or future, pose a risk to the sustainability of drinking water supplies.
- A vulnerability analysis enables delineation of designated vulnerable areas – also termed protection areas:
 - Wellhead Protection Areas
 - Intake Protection Zones
 - Highly Vulnerable Areas
 - Areas of Significant Recharge
- Threats Inventory and Issues identification involve identification of threats to drinking water sources and existing watershed issues that may have an impact on drinking water quality

TEC Recommendations: Water Budgets

- Water budgets should reflect specific watershed conditions and data availability, and improve with successive plans developed.
- Water budgets should be used to determine if existing/proposed withdrawals are a threat
- Municipalities should maintain a long-term water supply strategy (50 years)
- Vulnerable Aquifers and aquifer recharge must be identified to enable protection of quality and quantity
- Ecosystem should be considered in determining sustainability



Vulnerability Analysis

- The vulnerability assessment enables delineation of designated vulnerable areas – also termed protection areas.
- Each of these protection areas is established and identified in order to denote drinking water source areas that warrant an increased focus on threats identification, risk assessment and risk management activities.
 - Wellhead Protection Areas
 - Intake Protection Zones
 - Highly Vulnerable Areas
 - Areas of Significant Recharge

TEC Recommendations: Vulnerability Analysis

- **Wellhead Protection Areas (WHPA) must be recognized as vulnerable areas and should be delineated around all municipal wellheads and include all land within the 25 year “time of travel” capture zone.**
 - Where possible, these delineations should incorporate 3-D modeling and “advection” times.
 - Special zones within the 25 year WHPA should be delineated for focusing risk assessment and management efforts for particular threats:
 - 5 year Time of Travel capture zone – DNAPL^[1] and other non-pathogen contaminants
 - 2 year Time of Travel capture zone – pathogen management
 - 100 m, fixed radius, pathogen security zone
- **Intake Protection Zones (IPZ) must be recognized as vulnerable areas, and should be delineated around all municipal surface water intakes and cover a zone that represents a “minimum response time” for the drinking water treatment plant to respond to an incident such as a spill.**
 - minimum time of 2 hours for inland rivers and lakes; Great Lakes intakes, 1km fixed radius
- **Vulnerable areas in the landscape need to be delineated and protected, including “highly vulnerable aquifers” and “high recharge areas”.**
 - Classical “Time of Travel” approaches should be used, incorporating *Surface to Aquifer Advection Times (SAAT)* where possible

Identifying Threats and Issues

- An important element of source protection planning is identifying threats to drinking water sources and existing watershed issues that may have an impact on drinking water quality.
- Issues that may pose risks to drinking water supplies, now or in the future, are identified through consultations with local stakeholders and collection of existing information about the water resource (e.g., water quality monitoring data).
- The identification of threats involves an examination of historical, current and future planned land use practices to identify those activities that could negatively impact drinking water.



TEC Recommendations: Identifying Threats

- **A “Threats Inventory Database” be developed, to serve as an important tool for local committees to assist them with identification of threats and to provide information that can be used for risk assessment.**
 - The database is to be maintained by government and will include:
 - provincial and local components;
 - generic hazard information regarding threats.
- **The province should identify “threats of provincial concern”.**
 - These threats should be ones that are commonly found across Ontario and have been documented to impact drinking water sources. The purpose of the list is to ensure that these “common” threats are subjected to risk assessment in vulnerable areas, and risk managed across the province.
 - A list has been put forth by the TEC for consideration

Proposed List of Threats of Provincial Concern

- The concept is that these threats **MUST** be assessed in designated vulnerable areas: Wellhead Protection Areas, Intake Protection Zones, Highly Vulnerable Areas and Areas of Significant Recharge
- Once assessed, appropriate risk management actions for these threats **MUST** be implemented

• Artificially enhanced conduits to the aquifer
• Liquid Chemical Storage /Use
• Historical Commercial/ Industrial Sites of Concern
• Waste Disposal Activities
• Biosolids and Septage
• Manure
• Sanitary Sewage and Septics
• Water treatment plant discharges
• Road Salt/ De-icing
• Cemeteries
• Direct Stormwater Infiltration
• Non-sustainable water takings

TEC Recommendations: Identifying Issues

- **An “issues approach” must compliment the use of the “Threats Inventory Database” to ensure that existing drinking water issues and potential issues are not missed.**
 - The issues approach compliments the threats database by looking directly at existing information, such as water monitoring data and local knowledge to identify potential problems that need to be assessed.

Risk Analysis

- The first second step in the Threats Assessment Framework is collectively termed “Risk Assessment”
- It includes a Risk Analysis that results in a Categorization of Risks
 - For each issue/threat identified, the quantity, severity, irreversibility, and magnitude of the threat is considered
 - i.e. how big and bad is the threat/issue?
 - The vulnerability of the drinking water source to the impacts of the issue/threat are also considered
 - i.e. can the threat/issue get to the drinking water?
 - Using this information, a determination of how much risk is posed by the threat/issue is made



TEC Recommendations - Risk Analysis

- Risks to drinking-water sources must be assessed using a provincially consistent risk assessment approach that ensures science-based decision making.
 - The approach should be semi-quantitative in nature.
 - The risk assessment process should lead to the categorization of risks to drinking water sources as either “Significant”, “Moderate”, “Low” or “Negligible”.
- Significant Risks are the most critical risks to drinking water
 - *A significant risk is one that has a high likelihood of:*
 - *rendering a current or future drinking water source impaired, unusable or unsustainable; or*
 - *compromising the effectiveness of a drinking water treatment process,*
resulting in adverse human health effects.
- Threats of Provincial Concern should not be assessed as negligible risks

Current Activities

- EBR Consultation on both Committee's reports

Future Activities

- Pending outcome of consultations, will be working to develop:
 - Threats Inventory
 - Data-sets required to carry out assessment reports
 - Information Management processes
 - Semi-quantitative Risk Assessment process
 - Identification/Development of Best Management Practices to manage risks
 - Revised Legislation and Regulations



Thank You

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