REPORT OF THE

SECOND NATIONAL WORKSHOP

ON GROUNDWATER

SEPTEMBER 20-21, 2001
OLYMPIC VOLUNTEERED CENTRE, CALGARY

October 12, 2001

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EXECUTIVE SUMMARY

2nd National Workshop on Groundwater
Olympic Volunteered Centre
1833 Crowchild Trail NW, Calgary

Introduction and Background

The National Ad-hoc committee on Groundwater organised the Second National Workshop on Groundwater in Calgary on September 20 and 21, 2001.

Since May 2001, a national ad-hoc committee from federal and provincial government agencies, universities and industry has been drafting a common framework for co-operation and collaboration on groundwater studies across Canada. The document draft was submitted for discussion at the workshop.

The purpose of the workshop was to consult with key stakeholders from various agencies. The recommendations outlined in the draft document will provide the general direction and key actions needed in future years to develop a collaborative and concerted approach to improve the management and protection of Canada's groundwater resources.

Since almost 10 million Canadians depend upon groundwater as their primary source of potable water, it will require the combined efforts of all levels of government and other stakeholders using and developing the resource, to meet the challenges necessary to sustain the availability and quality of groundwater in Canada.

Format

The workshop was designed as a two-day meeting including official presentations, plenary discussions and breakout groups sessions. Day one, focused on presenting the framework for co-operation by the ad hoc committee members, listening to the feedback from a stakeholder panel, and brainstorming on various elements of the document through breakout groups discussions.

Day two of the workshop focused on presenting the detailed reports from the breakout groups and a plenary discussion on these results, as well as reports from an observer panel. The workshop ended with an action plan for immediate steps. Participants to the workshop agreed to extend the mandate of the current ad hoc committee to allow finalising the document based on the workshop results. The membership of the ad hoc committee was extended, for a finite period of time, to include people who will help in revising the document.

Raison d'être

Water resource management is increasingly being addressed at local, national, international and global scales. In contrast to other developed nations, Canada does not have a national-scale and current inventory of its groundwater resources. The most recent national

assessment was published in 1967. Water is also becoming increasingly important economically both as a commodity and as an essential resource for many industrial sectors (e.g., agriculture and agri-food). Increasing demands and costs to secure clean water and decreasing availability in some areas have important consequences for future growth in all sectors of the economy. Facing these water-related issues will require involvement by, and close cooperation between, federal, provincial, territorial and municipal governments.

For the past two years, the Geological Survey of Canada (GSC) has been consulting with a wide range of stakeholders about collaborative and cooperative efforts towards a national strategic vision and action plan. In June, 2000 a national workshop on groundwater, initiated by the GSC, was held in Quebec City. It was attended by representatives from most provincial and territorial departments and agencies responsible for groundwater management, Environment Canada, Agriculture and Agri-Food Canada, Indian and Northern Affairs Canada, and Health Canada. Representatives from academia, industry and associations such as the University of Waterloo, Canadian Ground Water Association and International Association of Hydrogeologists also attended. The workshop identified issues linked to Canada's groundwater, and explored various means for addressing them. The participants stressed the importance for Canada to understand its groundwater quantity and quality, and expressed the need for a better coordination and collaboration at the federal level and between federal and provincial agencies. The creation of an advisory or coordinating committee that would include federal and provincial agencies and other representatives was suggested.

The results of that first meeting were used to define directions and identify priorities for groundwater research, and form a basis for establishing a Canadian strategy and partnerships to address knowledge gaps. The GSC coordinated the creation of a national steering committee to foster groundwater studies at the national level. As a first step, a temporary National Ad Hoc Committee on groundwater was established to develop a first draft of a national groundwater strategy, and to promote the strategy to interested federal and provincial departments and other stakeholders. It is envisaged that the final version of the strategy will be prepared through a more formal structure that will be outlined in the first draft.

The second national workshop on groundwater represented the inaugural presentation to the groundwater community of the Framework for Collaboration in Groundwater across Canada resulting from these efforts. This workshop debated the contents of the draft strategy produced by the ad-hoc committee, and sought consensus from participants.

Representatives from each province and territory as well as some federal agencies attended and helped fine-tune both the framework for collaboration and the permanent mechanism to implement it. Their participation was crucial to the debate and the design of the mechanism for coordination and implementation of the proposed framework.

The main objectives of the workshop were to:

1. Present the draft document of the framework;
2. Discussed the recommendations presented in the document; and

3. Obtain consensus on:
    3.1 a structure for a groundwater advisory council;
    3.2 a framework for co-operation; and
    3.3 delineating co-operative projects.

The ad-hoc committee's recommendations discussed at the workshop, included: inventory of the groundwater resource in Canada; creation of an advisory framework mechanism to foster and advocate groundwater as a national strategic resource; create and raise public awareness on the importance of groundwater; and foster co-operation and collaboration between all jurisdictions/stakeholders in groundwater management and utilisation.

About 70 delegates attended the workshop, studied the recommendations and decided on actions that will have an impact on the management and protection of this priceless resource.

After a comprehensive presentation of the framework by members of the ad-hoc committee, participants were divided in four groups to discuss separate parts of the framework. These were:

- Vision, goals and objectives;
- Co-ordination/collaboration mechanisms;
- Scientific program I: Resource inventory and monitoring; and
- Scientific program II: Outreach, information and training.

General conclusions

- There was general agreement on the proposed framework for collaboration in groundwater across Canada. Representatives from various organisations indicated a strong support and their will to participate. The document as it is, however, should be revised in accordance with the workshop discussions.

- It was agreed that the document, after revision, should be addressed to governments for endorsement and development of co-operative programs, by the ad hoc committee on behalf of the assembly.

- The structure proposed for a Canadian Groundwater Advisory Council was adjusted and accepted with suggestions to modifying the executive committee as a federal-provincial committee. On this crucial point, there was also a semi-official proposal to link to the Council of Canadian Ministers of the Environment (CCME).

- The co-operative programs, or projects, agreed upon were:
    - Resource assessments (e.g. mapping, inventory)
    - Monitoring
    - Outreach
    - Information
    - Training
    - Specific research activities

Recommendations

It was proposed, and accepted, that the current ad-hoc committee continues with the tasks to finalise the framework document. However, because of the importance of collaboration of all types of organisations across Canada, the ad-hoc committee membership was extended with the sole purpose of helping the ad-hoc committee to re-shape the framework document and with a timeframe of 3 to 6 months, or until the work is completed (tentatively on February 2002).

The extended membership includes one person from each of the following: CCME, NGSC, IAH, Yukon, Alberta, Manitoba, Quebec, Nova Scotia, PEI, NFLD, municipalities and industry (e.g., consultants).

No additional workshop will be needed to finalise the document

It was suggested that in parallel with the revision of the framework document, a plan including communication and potential funding mechanisms, with dates, be drafted. Additionally, and in order to give credibility to the framework from the beginning, it was suggested that the Canadian map of the incipient groundwater monitoring networks presented during the workshop, be completed with the addition and support of provinces who would share their information and monitoring data.

Next immediate steps

- A detailed description of the workshop discussions will be written in the workshop minutes by the ad-hoc committee chairman and his assistant.

- Names of members of the extended ad-hoc committee will be forwarded to the ad-hoc committee chairman in the week following the workshop by the persons invited during the workshop.

- An action plan for communication, funding, etc., will be prepared by a smaller group of the extended ad-hoc committee.

- Other steps for the mid-term will be designed by the extended ad-hoc committee after the document has been reviewed and revised.

DETAILED MINUTES

AGENDA

Chair: Alfonso Rivera, Natural Resources Canada, Geological Survey of Canada
Facilitator: Jim Hendry, University of Saskatchewan

Day 1 Thursday, September 20, 2001

8:00 - 8:30 Registration
8:30 - 8:45 Welcome, introduction, messages (Jim Hendry, Alfonso Rivera)
8:45 - 9:00 Objectives of meeting, Overview of workshop (Jim Hendry)
9:00-10:00 Presentation by the Ad-hoc Committee:

1. Overview of the Framework (Cam Baker)
2. Background, Principles, Potential Outcomes, Vision (Al Kohut)
3. Co-ordination and collaboration (Alfonso Rivera)
4. C-operative Programs (Allan Crowe)

10:00-10:30 COFFEE BREAK

10:30-11:30 Initial Feedback from Stakeholder Panel (Diana Allen, Steve Holysh, Kevin Parks)
11:30-12:00 Discussion - Plenary

12:00 - 13:30 LUNCH

13:30 – 13:40 Explain breakout groups process (Jim Hendry)
13:40-14:40 First Breakout Group Discussions

Group 1 : **Vision, goals, objectives**
Leads: Harry Rhode, Martine Savard
Group 2: **Co-ordination/Collaboration mechanisms**
Leads: George Somers, Harvey Thorleifson
Group 3: **Scientific program I: Resource Inventory and Monitoring**
Leads: Garth van der Kamp, Cathy Ryan
Group 4: **Scientific program II: Outreach, information and training**
Leads: David Sharpe and Nga de la Cruz

14:40-15:15 COFFE BREAK

15:15-16:15 Second Breakout Group Discussions (Groups to discuss different themes)

16:15-16:30 BREAK
16:30-17:00 Debrief and adjourn for the day (Jim Hendry)
17:00 ICEBREAKER

DAY 2 Friday, September 21, 2001

8:30 - 8:45 Welcome, more messages, objectives for the day (Jim Hendry)
8:45 - 10:00 Reports from the breakout groups and plenary discussion

10:00-10:30 COFFEE BREAK

10:30-11:00 Plenary discussion (continued)
11:00-12:00 Report from Observer Panel (Jim Miller, Ken Howard, Keith Guzzwell)

12:00-13:00 LUNCH

13:00-14:00 Discussion: implementation of strategy, action plans, champions (Alfonso Rivera)
14:00-15:00 Wrap-up, Conclusions, Recommendations (Jim Hendry, Alfonso Rivera)
15:00 Final Adjournment

DAY 1

WELCOME AND INTRODUCTION

Professor Jim Hendry, the workshop facilitator, presented the objectives of the draft document in three areas:

- Provide goals and objectives
- Provide future directions
- Provide mechanisms for collaboration.

He acknowledged that the Framework was prepared by a group of dedicated people to help set the stage for collaborative work in groundwater. He presented the composition of the National Ad Hoc Committee members.

In his opening remarks, Dr. Alfonso Rivera the workshop chair, acknowledge the work of the ad hoc committee members and indicated that the groundwater issues are constantly emerging in the news since more than a year after the Walkerton accident. He told the audience that in his quest for consultations across Canada, he has observed that the average Canadian is not informed on groundwater. He stressed the attendees that it is important for the sustainable development of groundwater, that we share our knowledge with a common vision, indicating that currently about 10 million Canadians depend on groundwater. He provided a brief background for this initiative that started more than a year ago with the first groundwater workshop in Quebec City.

Jim Hendry noticed that participants to this workshop came from different horizons and had different perspectives. He made clear that comments will be given to a living document, that will evolve with time. He encouraged the participants to discuss, bring constructive ideas, and positive criticism to the proposed framework.

Jim Hendry presented the objectives of the workshop:

- Present the draft document
- Discuss the recommendations presented in the draft document
- Obtain consensus on
  - i) a structure for a groundwater advisory Council
  - ii) a framework for co-operation and
  - iii) delineate co-operative projects

His role as facilitator was to :

- Help to accomplish the goals of the meeting;
- Listen and provide focus;
- Encourage participation;
- Co-ordinate details; and
- Remain neutral.

In acknowledging that everyone has wisdom, he requested everyone's wisdom for the wisest results.

PRESENTATION BY THE AD HOC COMMITTEE

Members of the national ad hoc committee on groundwater made an extensive presentation of the proposed framework for collaboration, as follows:

1) Overview of the Framework : by Cam Baker.
2) Background, Principles, Potential Outcomes, Vision : by Al Kohut.
3) Co-ordination and collaboration: by Alfonso Rivera.
4) Co-operative Programs : by Allan Crowe.

As introductory remarks, and to put this initiative under perspective, Rivera presented a summary of the evolution of groundwater research in Canada in the last 100 years showing the most relevant works that have marked the science of hydrogeology since the 1930's. He mentioned: the Theis work (1935); the Brown Report (1967); the Federal Water Policy (1987); pollution and remediation studies at local-scale (1970-1990); the Freeze and Cherry book (1979); and more recently, the Canadian Geoscience Council report (1993); the International Joint Commission report (1999); the Government Roundtable on water (2000); the 1st National Workshop on groundwater (2000); the Walkerton accident (2000); and the current document of a National Framework for collaboration in groundwater (2001).

At the end of the ad hoc committee's presentation, Rivera gave examples of on-going collaboration on groundwater in Canada, that are a direct result of the ad hoc committee's work. He presented an incipient groundwater observation wells networks and an incipient mapping and inventory of regional aquifers. The former including four provinces, and the latter including regional aquifers in southern Saskatchewan.

The ad hoc committee's detailed presentations are reproduced in Appendix 1.

INITIAL FEEDBACK FROM THE STAKEHOLDER PANEL

The Stakeholder Panel represented a cross-section of participants. These provided critical feedback on the entire document, subsequently stimulating the discussions.

The stakeholders panel was formed by:

Diana Allen: Assistant Professor, Hydrogeology, Simon Fraser University, B.C.;
Steve Holysh: President of the IAH Canadian chapter, and principal Hydrogeologist for the Municipality of Halton, ON; and
Kevin Parks : Alberta Geological Survey.

See Appendix 2 for the minutes of the presentation from the Stakeholder Panel.

PLENARY DISCUSSION

The feedback from the stakeholder panel prompted an enthusiastic discussion by the participants during the plenary following their presentations. Most for the discussion was concentrated in three points: a) policy versus science; b) classical mapping activities versus assessment; and c) roles of provincial agencies in this framework versus federal departments.

Jan Boon, from NRCan, indicated that this very workshop is led by the provinces because of their early involvement in the preparation of the draft document. He added that science is very important and the policy part needs to be dealt well because it raises many concerns. It is difficult to tackle both.

George Somers, from PEI, agreed but policy needs to be fed by science, if they are too much separated they will not have impact. Both should be kept together in the document.

Kevin Parks, from Alberta Geological Survey, examined that, concepts such as well capture vs. safe yield, vulnerability, and others, are "value judgements" which touch policy. Mapping aspect is OK, but vulnerability should be out. Research should be focused towards the process of mapping.

Cathy Ryan, from U. of Calgary pointed out that the most expensive activity with the less impact is a national inventory, because of the large endeavour. Alberta faced problems when it tried it once. If carried out, it should be done in partnership with organisations that need the information. Good science is relevant to policy if information is passed on to policy makers. The focus should be science, but in concordance with what policy makers need. In a word, policy should be the factor that drives the mapping and inventory.

Diana Allen, from Simon Fraser University agreed that there is a need to link science to policy so that it does not end on shelves. Information should be out to the people who need it. Avoid policy but not ignore it.

Rivera clarified that the intention of the framework was not to develop policies per sei, it was more towards a research-directed framework; however, the framework recognises the linkages between the two.

Rod Allen from Environment Canada was of the opinion that the linkage between policy and science is critical. Many issues need to be looked out from policy and science perspectives.

Bob Chandler from Alberta Environment thinks that the document is too broad to understand the role of science vs. policy. It needs to be more focused. Grassroots right now. He suggested to make a clear separation between the policy and science roles. He acknowledged, however, that support from policy people was needed.

Jan Boon insisted that the roles of each player should be defined very clearly. He agreed that the framework is not a mapping program only. Policy vs. science have to be clearly separated for the document to progress. If the policy aspect is ill perceived, it will created limitations.

Bill Calder, from Alberta Environment and on behalf of CCME informed that CCME had "ferocious agreements". Science should be serving the interest of the parties, driven by policy requirement. He thought that it may not be appropriate to focus on both now. He made known to the participants that the current CCME agenda had priorities on water. The Council of ministers has endorsed new directions on water. A communiqué should make a strong statement on water soon. Umbrella Water Planning group. Co-ordinate a variety of water activities, link to other group. The draft Framework is very positive as assessed recently by a group. He sees an opportunity in linking up, perhaps to envision this as a 'network' with 2 co-chairs. CCME and the group proposed here could leverage resources and help orient issues, ministerial endorsements and considerations. He recognised that this is a draft strategy document. The group would be happy to push this forward.

John Cooper, also from CCME, provided a message on their behalf. He sees good progress since the last workshop.

- He recognises that there are areas where we need to do a better job. Research monitoring and guidelines need to be conducted more efficiently through sharing of information and setting priorities. Has asked for recommendations so that this is the case.
- On water quality : must ensure safety and security of water by looking at research. Source-to-tap approach.
- Provinces and others have a say in setting the research agenda federally and more broadly by stating needs: will have meeting to know expertise, create research networks
- Research should be profitable, should get back to the users.
- Some workshops on water quality and water issues led by NWRI, deal with: groundwater, land use practices, water use recycling.
- On monitoring : developing stage : quickly recognised that National Monitoring network may not be the best way. Create a network of networks, each managed independently but sharing information. Also on the gaps in monitoring issues, suggested to work with other agencies to identify and solve.
- On guideline development: CCME water quality guidelines with HC. NRCan and AAFC could follow in the future.

- Need better linkage between agencies that develop guidelines.
- On management Practices: Co-ordinate to prevent provinces and agencies to develop from scratch, share knowledge with individual jurisdictions and build on.
- Technologies: Centre of Network of Excellence, etc. work together, bringing the info together.
- On small rural and northern communities : More dependant than others so they need more focus.

George Somers from PEI talked on surface water vs. groundwater processes need to be addressed, because they are very much intertwined.

Eric Hodgins, from the Municipality of Waterloo was disappointed that the draft document had not more about policy. He recognised jurisdictional issues at play. He questioned "Where is this document going?" "If it is only lobbying for funding, we are missing an opportunity". It should not be limited to mapping. It needs public buy-in. Mapping leads to understanding and understanding to policy. It needs some core research done, avoid flavour of the day.

Diana Allen mentioned that researchers through NSERC will still have the opportunity, but by knowing policy, their efforts may be better directed. She recognized the need for independent conduct of research.

Cathy Ryan mentioned that the USGS used to do only mapping and inventory, now they conduct research on water quality and do joint program with Dept. of Agriculture in the USA. She asked if the ad hoc committee looked at the model. She stressed the need to move beyond mapping and remediation.

As an answer, Alfonso Rivera briefed that the recent National Science Foundation document was studied. It contains national strategies that are farther than we are. Those strategies are oriented with groundwater-surface water interactions, land uses, sustainability, and vulnerability. The last 20 years of research were based on regional frameworks for watershed studies. The USGS is one the leaders developing those strategies. In Canada, he continued, "we have a competing usage of water that needs to take care of it. The USGS already have the maps to support long term sustainability, while we in Canada do not. We need a long-term commitment and a common view to solve problems associated with knowledge gaps".

Hugh Simpson, Ontario Ministry of Agriculture Food & Rural Affaires is of the opinion that education should be a priority from the beginning because there is a lag time when it comes to technology and knowledge transfer. Interaction would grow over time.

In order to remove confusion that emerged from the plenary discussion Alfonso Rivera clarified three particular points:

- GSC initiated and has supported this effort, but this is not a GSC initiative, the GSC is only one player in the framework. Want this to be inclusive, not to be a GSC Program.
- No intent to address policy, but acknowledge policy is involved, because of strong linkage between science and policy; the framework avoids but recognises policy.

– On mapping, or assessment of regional aquifers, he mentioned that the activity proposed includes not only the inventory but the full assessment of the dynamics, processes, and others, this assessment represents only one component. Other aspects, also very important in the co-operative programs are communication, linkages, training, and co-ordination.

At the end of the plenary discussion, Jim Hendry summarised by concluding that the general perception points towards a good document, but that it needs more work in order to be endorsed.

BREAKOUT GROUPS PROCESS

The objectives of the groups were:

- To brain storm on a series of specific questions related to the four themes : Need to focus on 1-4 questions
- To provide opinions on these specific questions
- In no consensus is reached, discuss reasons on the next day's report.
- Should focus, focus, focus.

Jim Hendry provided some guidance to the group leaders.

- Introduce questions
- Capture responses
- Maintain focus
- Reach consensus
- Synthesise responses (on overheads)
- Present results to plenary

Membership in groups was as follows:

- Two sessions: Assigned participation in Session I.
- Free to participate in Session II.
- Ad Hoc members dedicated to specific sessions.
- Simplified logistics.
- The facilitator is mobile.

Questions for each breakout group:

<u>Group 1: Vision, goals, objectives</u>

1. Is a framework for collaboration in groundwater across Canada needed?
    - Do models in other fields exist?
    - What challenges can be anticipated?
2. The framework document lays out a Vision statement.
    - Is it appropriate?
    - What changes would you recommend?
3. What are your thoughts on the stated goals?
    - Too limited or too ambitious?
    - Problems anticipated or changes required?
4. The framework document outlines short, medium, and long term objectives.
    - Do you agree with them?
    - What potential problems do you see & are changes needed?
5. Should a Canadian Groundwater Advisory Council deal with:
    - technical issues, policy issues, or both?
6. In what manner should policy recommendations be made? (e.g. Water well construction/abandonment guidelines)

7. In your opinion, what level of endorsement is needed for the framework document?

Group 2: Co-ordination/Collaboration mechanisms

1. In your opinion, what are the major events that have shaped Canadian groundwater-related activities?
    - academic scene; municipal scene; provincial scene; federal scene
2. Could you define municipal and provincial responsibilities regarding groundwater?
    - Water agencies, Geological Surveys, Other agencies
3. Could you define the federal role in groundwater & federal/provincial/territorial mechanisms for co-ordination of groundwater-related activity ? such as:
    - Canadian Council of Ministers of the Environment (CCME)
    - National Geological Surveys Committee (NGSC)
4. What would you suggest to facilitate co-operation between a department with a legislated mandate and another department, or other agencies, that can make a contribution to their mandate.
5. Based on your experience/knowledge, please provide your opinion on membership, executive, committees, offices, resources, & powers for a Canadian Groundwater Advisory Council.
6. Should a Canadian Groundwater Advisory Council advise/ co-ordinate /seek funding?
7. Do you agree/disagree with the recommended model for a Canadian Groundwater Advisory Council?

Group 3: Scientific program I: Resource Inventory and Monitoring

1. What is the key information on groundwater that Canadians need most?
2. How should priorities for enhanced groundwater information be balanced between:
    - Making available existing data; name priorities
    - Collecting new data; name priorities
3. Is there a need for a national groundwater level monitoring network?
    - How would it work?
    - What are key data standards issues?
    - How to detect long-term trends?
4. Is there a need for other cross-Canada databases? How would these groundwater databases be managed?
5. Are regional groundwater assessments needed for groundwater management? Discuss scale, inputs, and modelling
6. Could you expand on the need (or not) for an inventory of Canada's groundwater resources in the context of long-term sustainability of groundwater resources. How would an inventory be built?
7. Would you recommend an additional national program within the suggested overall scientific program? If yes, please name it.

Group 4 : Scientific program II: Outreach, information and training

1. Discuss needs & roles among government, industry and academia regarding training and standards.
2. What approach to supplying groundwater related information should be taken:
   - Organise, standardise and make ***existing*** data widely available (provide examples); or
   - Collecting ***new*** data / information (provide the primary information gaps that should be tackled)
3. What information do Canadians need to place priorities for groundwater allocation among ecosystem requirements, human drinking water, agriculture, & other uses for groundwater?
4. How do we ensure information is in a form that maximises its use?
5. Who should do what, and how can we optimise education and outreach programs?
6. Would you recommend an additional national program within the suggested overall scientific program? If yes, please name it.

Day 2

WELCOME, MORE MESSAGES, OBJECTIVES OF THE SECOND DAY

Susan Till, Associate ADM for the Earth Sciences Sector of Natural resources Canada, said a few words. She is champion for the water file within NRCan. She views this workshop as an excellent opportunity for information exchange and is looking forward to the output of this very productive meeting.

Jim Hendry recalled some points that should be kept in mind during the reports from the break out groups. It was concluded on the previous day, that the document was viable and should go ahead. He mentioned that it is now that we have to identified the changes that are required. We should also clarify who is this document intended for? Senior management? Parliament? This group?

Alfonso Rivera mentioned that the document was intended for different clients: the provincial agencies that are managing the resource, federal departments with a mandate for water or dealing with groundwater research (e.g., EC, AAFC, NRCan, HC), Canadian associations and councils (e.g., CCME, NGSC, CGC). He recognised that it is not appropriate for other stakeholders, such as the general public, and we should consider a summary or a small brochure adequate for that particular public. This will be discussed when the status of this document is decided. It will not be submitted to industry and universities at this point.

REPORTS FROM THE BREAK OUT GROUPS

Group 1: **Vision, goals, objectives**
Leads: Harry Rhode, Martine Savard
Group 2: **Co-ordination/Collaboration mechanisms**
Leads: George Somers, Harvey Thorleifson
Group 3: **Scientific program I: Resource Inventory and Monitoring**
Leads: Garth van der Kamp, Cathy Ryan
Group 4: **Scientific program II: Outreach, information and training**
Leads: David Sharpe and Nga de la Cruz

The detailed minutes of the break out group reports are reproduced in appendix 3.

Although not in the agenda, time was given to Maurice Lewis, executive director of the Canadian Ground Water Association (CGWA) to address the plenary and present the industry perspective on this initiative. His comments are reproduced below.

Mr. Lewis would like to see more involvement from industry and a consensus on the way to move forward. The mission statement of CGWA is to encourage the management and protection of Canadian groundwater. He fully recognised, on behalf of the CGWA, that the framework is needed, in particular since Environment Canada left the topic of groundwater resources untouched since the early seventies. Mr Lewis made reference to a letter sent by the CGWA to the GSC asking for a liaison officer on groundwater issues some years ago. The CGWA was satisfied that the GSC had appointed a chief hydrogeologist, who later became their liaison.

Mr. Lewis mentioned that this document will have an impact on the 10 million people who rely on groundwater and that the CGWA should be a lead player in this framework. The CGWA is well positioned to reach the targeted audience. It has its own publications, has convened conventions and workshops, has established standards for a national certification programs and has agreements with the four training programs in Canada. He let known, however, that the association and its publications are poorly known in Canada.

He continued: “CGWA could lead the way but needs input from researchers. It could liaise and make recommendations to regional agencies, associations and law makers, instead of this committee providing advise to themselves”. He mentioned the advantages: “CGWA has a board of directors and can take decisions (do not need an ADM level). Funding is the only constraint, but more subscriptions could solve this problem”.

PLENARY DISCUSSION (Day 2)

The results presented by each lead of the four break out groups (details in appendix 3) again opened the way for a long and rich plenary discussion.

Representatives from Environment Canada mentioned that the document is a menu of many actions suggested by the ad-hoc committee. It should be used for information and to help co-

ordination. However, trying to obtain endorsement by organisations could represent a big task. If the document is left as a co-ordination document, it will not need to be so fine-tuned.

The workshop chairman agreed, but mentioned that the document is not ready as it is currently written, it needs a lot more editing. The general feeling he gets from participants is that there is a general acceptance of the proposed document and that we should go ahead with it, but at the same time many changes and re-focusing of concepts are necessary. These should be clarified in the discussions during the afternoon session

Cathy Ryan is of the opinion that making the document public does not necessarily mean that it is intended for the public, just informs everybody. She suggested that the Canadian Water Network (CWN) should be at the table. Rivera mentioned that professor Dave Rudolph is already a member of the ad hoc committee although not representing the CWN.

Nga de la Cruz from Alberta Environment, believes that "it will be a horrendous task to update the document to everyone's taste. She suggested that "we need to select a target audience, focus the document, and produce an executive summary".

Jan Boon agreed. We should not forget that this document is very important for the group. We should extract portions for different audiences.

John Cooper, from CCME, mentioned that the framework has to clearly identify vision and goals and have them approved. He questioned how far the committee wants to take this document? Is it looking for endorsement? Engagement? Funding? This has to be recognised by the group. The document could be used for reference to groundwater activities.

Rivera made clear that the document will be used as a framework for collaboration. He does not see it as a document designed to directly obtaining funding. If endorsed, funding will come through co-operation. As examples, he mentioned existing regional-scale, multi-agency and multi-funded groundwater projects such as: the Oak Ridges Moraine and the Southwestern Quebec fractured-rock aquifer projects. These works have developed without having a document of this nature.

Cam Baker sees that the document will help enhance federal-provincial co-operation, but it will not set policies. Inter provincial co-ordination is a benefit, policy development will remain within the provinces.

Jan Boon made some comments on the proposed model. He recognised that "we have reached an agreement on many questions". Yet, more work has to be done and we have to obtain concrete results. He urged the need for a way to get funding in order to achieve goals. The main point is that much of the items on stake are for the public good and some actions should be taken by the government. To be pragmatic, we should plug into government by means of advisory councils. These have been established by the federal government to advise formally. "In order to sing in the chorus, we have to know the tune". He continued by saying that if we want action, we should plug into governments in the official way, this will

allow our issues to be on their agenda. He suggested that we look at CCME; it could be organised with sub-committees.

He also mentioned that in the groundwater business there are a lot of players. How do you work together between government and other interested parties/researchers? He proposed to modified the current model at the level of the executive committee; this could be a federal-provincial committee on groundwater, and could get an official standing. It could be tied, for example with the CCME. At the same time, this committee would make a strong and formal link with the NGSC. A point was made that information would be stored and maintained for future generations. Provincial surveys have shown that they are resilient organisations and would be appropriate to store data, so this adds a reason to involve the NGSC.

Jan Boon finally suggested that the CGWA could drive the council and provide advice/direction to the federal-provincial committee. It could co-ordinate the work in groundwater among members, establish mechanisms for meetings and keep the group informed.

Nolan Shaheen from Sask Water, did not agree with the last idea. He mentioned that this has to be a federal-provincial initiative and the federal has a strong role to play. The key role should not be played by the CGWA.

Jim Hendry obtained the consensus in favour of having the executive committee be a federal-provincial entity. He also obtained consensus from the plenary on the council approach proposed (e.g., C-GAC).

Professor Ken Howard, from University of Toronto mentioned that CGWA lacks scientific expertise in hydrogeology, and suggested that the IAH Canadian chapter should be taking the leadership, instead.

It was mentioned that each province will have to decide who will be assigned on the council. And that there should be a mechanism to identify the best person. This should be an official who can feed in to the minister, a person representing policy. It was suggested that this mechanisms be specified in the final adopted model

Other comments indicated that the persons sitting in the executive committee should be high ranking officers who have influence on policy; not dealing with policy, but linked to policy. Everyone agreed that there needs to be a linkage between policy and science. However, ther was concern that if we concentrate on geoscience, we might be in trouble if the council is composed of representatives from policy only.

John Cooper did not think there was a need for concern; he thinks that the issues and mandate will dictate the expertise of the people who will participate. In CCME, for instance, separate groups work co-operatively. Some committees focus on research and they influence policy, whereas senior managers deal with the policy side.

John Cooper suggested to add a few points to refine the federal-provincial committee. This may not be part of CCME but could have strong linkages (EC leads groundwater studies in Canada). Federal-provincial co-chairmanship may be needed; operations may be agreed upon through consensus.

It was argued that questions on membership are details at his point. The question of the target audience for the framework will dictate the vision, goals, mission, etc.: government agencies? Everybody? Rivera noted that the framework would be available to all but not necessarily targeted to all.

It was argued on the need of a document to establish the committee. Participants believe that there is such a need, if we want to convince the government. In order to assign people, resources, you need such a document. It provides a background.

Jim Hendry obtained the consensus that this document should be addressed to government agencies. There was agreement on the vision, etc., but the document will have to be rewritten in a less scientific, and more striking style.

REPORT FROM THE OBSERVER PANEL

The observer panel was formed by:

Jim Miller, Agriculture, soil scientist, groundwater, and land use;
Ken Howard, University of Toronto; and
Keith Guzzwell, Dept. of Environment, Gov. of Newfoundland and Labrador.

The detailed minutes of the Observer Panel reports are reproduced in appendix 4.

The plenary discussion following the observer panel presentations is described in the next section.

DISCUSSION ON THE IMPLEMENTATION OF STRATEGY, ACTION PLANS, AND CHAMPIONS

Allan Crowe mentioned that very valid points have been made. He disagreed, however, with parts of Ken Howard's presentation. He corrected the statement that recommendations from the Gilliland report have indeed been addressed by provinces and federal agencies.

Ken Howard agreed that some significant progress has been made in the last 10 years. University programs have expanded. But progress is slow and we are getting behind. We have some catching up to do.

Diana Allen suggested that two things must be addressed: 1) The structure of the proposal itself, it needs to be more practical, it needs some fixing up to be able to take it up in the ladders of government. 2) The document needs to clarify some of the details of the framework, and to present a clear direction on where to go with it.

It was questioned if the IAH-Canadian chapter representation on the committee could be a provincial representative. Ken Howard mentioned that the IAH Canadian chapter is a large group that deserves a specific seat and plays an important role, it also reaches out at the international level. Steve Holysh agreed that IAH needs to play an important role in this national initiative.

Allan Crowe mentioned that other associations are also important, he cited for example the Canadian Geophysical Union and the Geotechnical Society. Who do we actually invite? Additionally, consultants should be represented. Ken Howard suggested that the IAH-Canadian chapter could well represent these groups.

Other comments followed noting that we shouldn't get "too fragmented" if we deal with national issues. There was a strong feeling that the executive committee should be science oriented, delivering on science. There are a series of steps to make, and these need to be revisited in the program. Science is considered important, and these comments should be supported.

Other comments made analogies with the federal-provincial drinking water sub-committee, where members have technical background or are managers with technical background. They get input from other departments and industry. They have regular meetings, and may be a model for C-GAC. Drinking water subcommittee has been recognised by the CCME as exemplary.

The central group (executive committee) may need to be a professional group advised by the advisory council, and reporting to the minister, then pushed to the policy people. However, some participants pointed that "policy making is like sausage making, you don't want to do how it is done!"

On the composition of advisory group, there was a suggestion that members of the executive committee coming from federal departments, such as EC and NRCan, not be members of the Advisory council. There were other comments with the exact contrary opinion, some feel they should be involved. Membership should not be derived from the council, but assigned by provinces.

The discussion on Co-operative Programs concluded on:

- **Resource assessment :** suggested to replace 'inventory'.
- **Monitoring :** should be carried out by provinces.
- **Outreach :** suggested to conduct a survey of what is available, a co-operative activity; send the same message to Canadians. But it can become costly and time-consuming; in favour of keeping it contained.
- **Training :** innovative approach with the network.
- **Other research activities**: to be further refined.
- **Information strategy**: not considered as a priority.

It was suggested to investigate the benefits of Co-operative Programs versus Working Groups.

Rivera mentioned that another chapter in an earlier version of the draft strategy was prepared for assessment of regional frameworks with working groups. It had a number of suggestions that would have impact on various other issues. However, it was removed from the current working draft on the committee's recommendation.

Garth Van der Kamp urged the need of co-operation on monitoring to make a national monitoring system. Cathy Ryan thought that there is a need to co-ordinate the network, as a network of networks.

Jan Boon suggested that the difference between policy and technical work needs to be clarified; he asked if this should be identified as an activity, or as program?

Jim Hendry suggested that this topic could be tackled within the different groups. At this stage there is no need for prioritisation of the programs. Rivera noted that the list of proposed programs was the result of consultations during the 1st national workshop on

groundwater. Cam Baker sees a problem that if the co-operative programs are not perceived to be important relative to the provincial ones, they will be disregarded.

Rivera noted that the framework is not about telling what to do, rather these are guidelines for co-operation at the national and regional scales. These could be used as a reference to provide orientation. He cited the example of the Oak Ridges Moraine project. Cam Baker suggested to call them liaison programs.

Jan Boon insisted that it has to be very clear that this is co-operation between jurisdictions. It would help provinces to come together. Co-operation with all the partners must be clearly written up.

John Cooper expressed his opinion that a lot could be done by provincial jurisdictions but there is room for co-operation. This should be seen as a menu. Present it and see who are the takers. Need to know what is proposed under these headings. There must be consensus on the bullets, not on what goes in.

Al Kohut said that maybe we should not assume that these are co-operative programs. Maybe some participants will not co-operate.

FINAL CONCLUSION, RECOMMENDATIONS, AND ACTION PLAN

- The major conclusion is that the workshop reached all the objectives. There was a general agreement with the initiative. Comments indicated that "it has been long overdue".

- On the questions for the appropriate audience for the framework: the general answer was: the governments.

- On the proposed C-GAC Structure: yes, but establishing the executive committee as a federal-provincial committee.

- On the co-operative programs: Yes. The name could change (suggestions: co-operative activities, elements for collaboration, co-operative opportunities).

Participants were asked if they were favourable for a 3-month extension of the current ad-hoc committee with an extension of 9 to 12 more representatives. The intention being to help reshape the document. New representatives were suggested from: IAH, NGSC, CCME, territories, Manitoba, Alberta, N.S., P.E.I., QC, Nfld, Industry/Consultant and municipality. These could make up to a total of 21 people for a finite period of time. They would work via teleconferences and email exchanges. These would lead to the implementation of the C-GAC.

The plenary accepted both to extend the time of the current ad-hoc committee and to extend the membership, as suggested.

Members of the CCME indicated the clear next step is to complete the document; that it needs to be a much shorter document. Once it is completed, it should be sent to the larger group for consensus.
Jim Hendry asked for milestones to be set. He suggested that this could be done within the document; the ad-hoc committee should be drafting a plan with dates and than circulate. Par example, to develop a plan for communication and funding.

Alfonso Rivera asked for names of the new representatives by end of the week following the workshop. Current members of the ad hoc committee agreed to continue to serve on the now extended committee.

Two names were immediately suggested, NGSC : Rick Richardson. Representing the NGSC and Kevin Parks representing the province of Alberta. Steve Holysh promised that he will find an industry consultant from Ontario.

Alfonso Rivera proposed an action plan for the immediate future, items will be:

- prepare a table with the ITEM, the WHO, the HOW, and the WHEN
- prepare the detailed workshop proceedings
- Revise the draft document based on the workshop results
- Make a professional editing of the final document and translation to French
- Implement C-GAC
- Obtain federal agreement
- Seek for endorsement
- Consult with agencies
- Prepare a communication plan and a funding strategy
- Re-organise the new extended Ad-hoc committee

Jim Hendry finds that it is a bit ambitious to do all this within a few months. John Cooper: suggested that the work should continue until it is done, for instance 1st of February 2002 for completing document, and with actions thereafter. Make it brief. Will allow for buy-in, and endorsement by various organisations.

Alex Desbarats suggested to draw a list of joint federal-provincial projects in an appendix.

Harvey Thorleifson indicated that there was excellent progress through this meeting. We should show and report that progress has been made without problems arising. Every agency is concerned and should pass the message of excellent collaboration. System in place now. Incremental steps will make it better.

John Cooper warned on the issue relative to funding, we should be cautious. Collaboration should not be contingent on funding. Primary objective is to start collaborating and create mechanism to set up priorities. We can do a lot with existing resources if we use them more efficiently.

Jan Boon acknowledged that the ad hoc committee as well as the facilitator have all made an excellent work.

Rivera adjourned the meeting at 14h30.

APPENDIX 1

Presentation by the Ad-hoc committee

Overview of the Framework by Cam Baker

The Ad-hoc Committee is composed of representatives from Industry, provinces, federal. Their perspectives were diverse but the document may still have gaps. The document was not approved by the members' organisations. The establishment of the committee was a recommendation of the 1st National workshop on groundwater. The GSC has maintained, supported and participated in the initiative but this is not a GSC document. The Ad-hoc committee's role finishes with the end of workshop.

The evolution
- Recommended by the 1st National Workshop on groundwater
- Initiated by the Geological Survey of Canada
- Ad-Hoc Committee formed on a temporary basis (5 months)

Why do we need a framework?
- Groundwater is a strategic resource
- Consequences for economic growth
- Lack of assessment of this resource
- Identified knowledge gaps
- Quantity and quality issues in all regions
- Lack of interjurisdiction co-ordination
- It is necessary to educate the population

What is the framework?
- A draft discussion document
- An attempt to point the way for co-operative efforts among all levels of government, groundwater related industries; agencies; stakeholders, universities, and NGOs
- Science based outlook

Framework goals
- A means of acquiring groundwater information and knowledge
- Improving communication among all players
- Establishing effective linkages of groundwater information databases (need effective ways for sharing data so that it is available for all)

Purpose of the framework
- Set goals and objectives (short term-12 months, middle term–3 years)
- Provide a general direction and actions (needed in the next 10 years)
- Provide mechanism to facilitate synergy and collaboration in groundwater studies

What the framework is not :

- A transfer of power
- A means for setting policy
- A guarantee of dollars for groundwater studies
- Something that will live without support and backing (general agreement that what people will develop, people will help sustain)

What can we gain?
- Collaboration and Co-operation (planning, data sharing, etc..)
- A means of maximising investment in groundwater investigations and research
- Effective and timely Research (Identification of needed topics)
- A mechanism to gain NGO input

What is needed?
- A critical review, Is the Framework reasonable, achievable?
- Are pieces or viewpoints missing?
- How inclusive can the framework be?
- Will it make a difference?

Background, Principles, Outcomes and Vision by Alan Kohut

Background
- Economic importance : PEI , BC, major dependency everywhere
- Increasing demands; many qualities makes it attractive
- Quantity and quality issues
- Strategic resource-Link to security
- Knowledge gaps
- Public awareness- not very high
- Limited funding available-Severely limited
- Lack of co-operation

Principles
- Respect jurisdictional responsibility -legislation varies
- Address quantity and quality issues- varies by region e.g. Maritimes Vs Prairies
- Develop partnerships
- Promote stewardship- need to take leadership
- Develop co-operative programs
- Recognise geo-bio-climatic diversity
- Share the knowledge

Potential outcomes
- Improved understanding and scientific knowledge
- Informed decision making
- Guidance provided for research
- Improved communication and co-ordination
- Common issues addressed

- Resources pooled
- Innovative solutions developed e.g. GIS
- Raised public awareness
- Opportunities created

Vision
- Improving the knowledge base of Canada GROUNDWATER resources and making that information readily available to assist all levels of government, communities, industries and individuals in making timely and informed decisions
- Having a structure in place to keep the momentum going (Canadian GROUNDWATER Advisory Council) and implementing the Canadian GROUNDWATER framework

General Goals
- Acquiring a high standard of groundwater information and knowledge
- Improving communication and collaboration among all agencies
- Establishing effective linkages of groundwater information systems

Specific goals
- Inventory and characterise groundwater resources in priority areas
- Co-ordinate and facilitate a national groundwater monitoring system
- Create a national mechanism to foster and advocate groundwater
- Create an accessible groundwater information network
- Develop, promote and co-ordinate standards and guidelines for groundwater in Canada

Co-ordination and Collaboration by Alfonso Rivera

- There is a history of intergovernmental co-operation on water issues in Canada. Notably lacking is a commonly shared perspective on how to implement a framework for co-operation.
- In 1992, the Gilliland report made a comprehensive analysis for a Canadian groundwater strategy but did not design a framework to develop and implement the recommendations co-operatively.

- In 1993, The CGC report provided detailed recommendations for groundwater management but it did not promote a co-operative efforts. It did not receive the public and political attention required for sustainable development.

- Defining the scope for a Canadian framework is a major challenge. To be successful the roles must be specified within a framework for co-operation.

Alfonso Rivera presented the structure of the Canadian Groundwater Advisory Council (C-GAC) proposed by the Ad-hoc Committee, composed of 24 people supported by federal and provincial agencies, stakeholders, NGOs and universities. It would be steered by a National Executive committee composed of 10 people. Working Groups (Policy, Science, Standards, Communications) could be established. NRCan could provide Secretariat support. All C-

GAC partners will be encouraged to participated in the development of programs and will influence the goals and objectives.

Co-operative Programs by Allan Crowe

What is a co-operative program?

- Assist all levels of government in making informed decisions with regard to the protection, management and sustainability of groundwater resources
- Benefit all Canadians who use groundwater
- Applicable to all regions of Canada
- Within mandate of federal and provincial governments
- Communication and collaboration among all stakeholders

Why do we need co-operative programs?

- Common issues and problems faced by many Canadians in many regions of Canada
- Bring people together and generate a considerable pool of expertise

How do we implement co-operative programs?

- National committee to decide on priorities
- Integrated with provincial GROUNDWATER activities
- Focus on provincial-specific issues
- Must be flexible to recognise and adapt to changing issues and priorities

Co-operative program activities
4 main areas :

1) Application of knowledge
   Assessment-Inventory of Canada groundwater resources, regional groundwater investigations, monitoring, Public awareness
2) Scientific research
   Issues-problems which cannot be adequately addressed with current scientific knowledge. Provide scientific knowledge to address practical issues
3) Public awareness
   Access to information, Information for decision makers (websites, newsgroup linkages, basic fact sheets, etc)
4) Training
   Currently quite a bit a training : University programs, some high school courses, workshops, Conferences, water well driller training. Upgrade knowledge for workers, Standardise training programs, Make information available (technology transfer)

Linkages

- Quantity-quality
- Practical issues-policy-scientific research
- Groundwater -surface water-meteo
- Competing users, natural resources
- Integrated watershed studies

APPENDIX 2

Initial Feedback from the Stakeholder Panel

Diana Allen: Assistant Professor, Hydrogeology, Simon Fraser University, B.C.

- Important document : Opens communication lines for researchers and practitioners, will guide Research directions, will increase awareness
- Will have short and long term implications : ex: Personal perspective Vs Broader perspective : Fosters new linkages for groundwater studies
- Co-ordination : Develop a common framework for groundwater research : establishing C-GAC and Executive committee. We need to have some group to bring stakeholders together
- National Programs, Goal is ambitious, Scope is a bit fuzzy
- National Monitoring well network : Share data access through GIS, identify target areas for research and funding. Researcher must be informed.
- Increase public awareness, direct community involvement : Very important to be direct, not only web, also TV adds, etc.
- Improving communications and collaboration is important to achieve these goals

Points/Issues for discussion :

- Is there enough people to do all this? Research/People capacity
- Do we have the financial means to meet the objectives
- Inventory and characterisation:
  Need to be cognisant of end-uses of any maps and reports
  Scale of investigation with respect to vulnerability assessments
  Clear definition of what 'vulnerability' refers to
- Monitoring network and shared data
  Integrate in the framework, must take more than 10 years, will contribute to address transboundary issues effectively
- Need for direct communication with the public
- Identify key elements to address pertaining issues in groundwater in Canada

Steve Holysh: President of the IAH Canadian chapter, and principal Hydrogeologist for the Municipality of Halton, ON.

Steve Holysh indicated that in preparing his feedback, he asked for comments from colleagues and the IAH

- Not an easy challenge at Canada scale
- GSC Role Vs traditional/past experience in Mining and Petroleum
- Groundwater is different in terms of delivery due to multiplicity of stakeholders/agencies
- Multi-sectorial, multidisciplinary, incorporate specialists from various fields in the initiative, biologists, etc.

- Very good document overall
- The secretariat is important, NRCan involvement
- Many framework items mentioned fit well with needs

HOWEVER some issues:

- Must provide a clear vision of where we are, where we want to be and the roadmap to get there. Not clear
- Too research oriented, written by groundwater scientists for groundwater scientists
- Feasibility plan
- Role of industry, consultants. How does the work that they do will be integrated in the framework.
- Which partners are the key ones: local, provincial, etc. Address concerns of the groundwater community
- Databases, will the create new vehicles?
- Refocus the document around 4 Key themes: Data, Science, Training, Communication.
- Shorter paper, sections 5 and 6 could be appendixes
- Consultation : Find a way to get everybody's ideas and concerns in the document
- Short term goal: describe past examples
- Air quality framework That was done before, may be a model

OVERALL: Positive, the concerns may be addressed through the Group discussions

Kevin Parks, Alberta Geological Survey.

- His viewpoint is from a Provincial Geological Survey researcher perspective.
- A national coordination body/framework would be a positive development.

Concerns:
- Keep Policy/Regulation separate from science/research.
  Each jurisdiction has distinct societal values from which policy is derived.
  Can not take both paths simultaneously and succeed.
  This should be embedded at the beginning of the process.
- Need to take a clear decision on what the framework will be, research is preferred.

His recommendations:
- Rewrite and make a clear separation in the framework document
- Create National Inventory Framework/Program and change the title of the document.
- Priority role should be given to geological surveys in groundwater mapping:
  - as derived from the Intergovernmental Geoscience Accord;
  - Traditional role of surveys fits well;
  - Full range of geoscience expertise only found there;
  - Resilient organizations, long lived institutions.
- Separate process should be started for policy issues, with mandate from policy groups
  Advisory council to GSC and other provincial surveys

APPENDIX 3

Reports for the break out groups

Group 1: **Vision, goals, objectives**
Leads: Harry Rhode, Martine Savard

Vision

- basic vision statement is O.K., with some minor rewording
- statement is too long; prepare a separate vision and mission statement
- C-GAC can be eliminated from the statement
- include broad statements on issues; don't include objectives in vision
- focus on sustainability
- suggested key words: protecting and sustaining groundwater; working together in providing knowledge; benefit to public
- remove ' framework '; replace with ' implementing a groundwater collaboration network '
- remove the word 'natural' quality

Goals

- goals are in a logical sequence
- goals are very ambitious; need to prioritise
- use General Goals on pg. 8 instead and then ensure that the General Goals and Overall Goals are consistent; the Overall Goals would be the vehicle to achieve the general goals
- add the word dynamics to goal #1 (includes recharge, discharge, flow rates)
- goals 1 and 2 read more like objectives or activities
- goal #1 should be the main goal
- goals should be directly linked to the objectives
- providing data for management purposes
- combine goals 1 and 2 to read: provide information on the status and trends of groundwater quality and quantity to support sustainable management of groundwater resources
- set a separate goal for water quality and quantity
- if there are 4 general themes (i.e. application of knowledge; research, public awareness, training), there should be 4 accompanying goals
- ensure that stakeholders are informed
- goal #2 should read: ' building on existing monitoring systems ' (i.e. develop a network of 'networks')
- goal #3: keep but rewrite; develop more towards education and awareness
- goal #4: remove the word 'create ' since it applies an action; rewrite to read: ' provide improved public access to groundwater information'

- goal #5: need to clarify; should not be considered as regulatory guidelines; remove the word ‘ standards ’
- goal #5: develop guidelines to support best management practices

Objectives

- suggested format for objectives:
  short-term - planning stage
  mid-term - implementation stage
  long-term - reach/evaluate goals

Short-term objectives:
- ensure objectives are linked to goals; every goal should have clear objectives
- objectives are ‘actions’ and need to be measurable
- develop objectives with stakeholders/ industry
- most of the short-term objectives relate to goal #3
- need strategy to gain funding; need an advocacy group for this
- engage MOE ’s; link with other funded agencies
- Objective #1 should include a business plan and a marketing strategy
- Objective #1 should be the main objective
- combine Objectives #2 & #4
- remove Objective #6; similar to #8
- clarify Objective #8

Mid-Term Objectives:
- eliminate #1; should already be in place
- combine #2 & #3 (see results of other group that dealt with monitoring)
- develop/implement communications plan
- set actual dates for workshop; workshops should be held in conjunction with other annual meetings (i.e. IAH, GAC-MAC)
- #4 should read: ‘ initiate public awareness program’; this should run as a thread through the entire process
- #6 - identify criteria for prioritising research (i.e. shouldn’t set priorities)

Long-Term Objectives:
- distinguish products from ongoing activities
- #1 - remove word ‘ priority ’; use a ‘ blanket ’ approach considering jurisdictional priorities
- not clear; separate obtaining financial resources and identifying expertise to undertake research
- need to be flexible; look at these as targets to revisit annually

Group 2: **Co-ordination/Collaboration mechanisms**
Leads: George Somers, Harvey Thorleifson

1. What events have shaped groundwater related activities (academic/federal/provincial/municipal)?

Responses depended on « jurisdictional » perspective.

Federal: relate to specific milestones such as :

- Formation of Environment Canada
- Federal Water Policies
- Movements between Federal Departments
- Recommendations of Canadian Geo-Science Council
- Walkerton

Provincial

- Legislation
- Creation of provincial water strategies
- Reaction to specific events as drought and Walkerton
- Demand for info from the public and industries

Municipal

- Driven by provincial expectations
- funding programs
- infrastructure
- economic development
- public awareness/concern
- water quality
- water demand/groundwater as alternate source
- Regional water management initiatives

Academic

- little discussion
- observation that focus has shifted from general resource issues toward contaminant hydrogeology

Scoping exercise :

What activities « fit » within a co-operative framework?

Yes	No
Consultation/co-ordination Education/synthesis	Regulation Resource management &

Napping/assessment Research – process & regional Special expertise	protection International issues

2. Municipal and provincial responsibilities?

- Not much discussion on specific roles
- Focus on how roles are divided

Provincial Perspective :
- Usually a lead agency with a legislative mandate (often environment)
- Other department agencies play a support role (Geological Surveys)
- «Research» activities generally limited to what is needed to support policy/regulation/EIA's

Municipal Perspective :
- Generally what is mandated by Province
- Act as delivery vehicles for provincial initiatives
- Major role in land use planning and land control
- Same overlap and competition with regional water authorities

3. Federal roles and federal/ provincial/ territorial collaboration?

Federal role:
- Three specific areas:
  Research & Special expertise
  National programs
  International affairs
- Many « players » in broad sense
  (Environment Canada, NRCan, AAFC, HC, DFO, DND, Transport Canada, Parks Canada, DIAND)
- Key players
  smaller list (Environment Canada, NRCan, Health Canada, AAFC)
- Principal « vehicles » for collaboration
  (CCME, NGSC, IGA)

4. How to facilitate co-operation between agencies with a mandate and those that can contribute?

Facilitating Collaboration
- Mandated us contributing partners.

Consensus seemed to be :
- How federal departments collaborate is their own business but should be clear.

- How provincial agencies collaborate is their own business, Most often informal partnerships work best.
- Federal and provincial co-operation probably requires more formal agreements.

5. Membership, executive, committees, offices, powers and resources of a C-GAC?

- Questions 5 to 7 all intimately related.
- Not a great deal of consensus.
- Membership (24) considered large but recognition of need to be inclusive.
- Executive: opinion depended a lot on vision of this or alternate models but agreement that there is a need for a smaller group to make sure things happen.
- Committees and offices: no discussion.
- Resources
  Majority suggest limit to secretariat.
  Some concern that without resources, nothing will happen.
- Powers: essence of much of the discussion range from pure advisory group to integral part of government process (Via CCME, etc.)

6. C-GAC role – advise, co-ordinate and seek funds?

Should a C-GAC:
- Advise? Yes, but who?
- Co-ordinate? Definitely.
- Seek funding?
  - Majority suggest limit to support via secretariat
  - Concern that without money, objectives will not be met
  - Some feeling that C-GAC could « influence » how and where the money is spent.

7. Agree or disagree with proposed model?

Session 1
- agrees in principle with some fine tuning.

Session 2
- Many suggestions for alternate models
- Suggestions range from advisory body with no power or link to government to a group with a formal mandate and direct (policies?) input via a group such as CCME ***but*** no one said ***no***
- Fair bit of discussion on need for a large group of shareholders so us small group to be effective.

Group 3: **Scientific program I: Resource Inventory and Monitoring**
Leads: Garth van der Kamp, Cathy Ryan

Much of the groundwater assessments on applied research are initiated at the provincial level. There is a need for process on framework to establish inter-provincial linkages and/or federal involvement.

This breakout group only analysed three questions: 1, 3 and 5.

1. What is the key information on groundwater that Canadians need most?

- Where is the groundwater?
- How much is there?
- Is it safe and for how long?
- How will [X] affect my water?
  [X] = landfill
  intensive livestock operations
  subdivision
  etc.

3. Is there a need for a National Groundwater level Monitoring Network?

- Yes
- Levels & quality
- Integrate with climate, hydrologic and land use monitoring for mutual benefit
- Conduct assessment of existing networks
  - Collate
  - Consolidate
  - Identify where additional monitoring needed
  - Facilitate additional monitoring
- Small network of 'super', protected, targeted monitoring wells for long term monitoring

5. Are regional groundwater assessment needed for groundwater management ?

The general answer was: **YES**

- « *REGIONAL* »? Hydro (geological) boundaries
- « *ASSESSMENT* »? Geology, climate, quality, hydrology, vulnerability

Where?

For water supply, industrial and environmental concerns.
Trans-boundary issues

Representative.

Develop guidance documents

- Based on case histories (what worked, what didn't work?)
- Recommend methodologies:
  - get policy makers to ask the right questions
  - guidance on modelling
  - vulnerability mapping

Overall comments from the group:

- Link provincial networks emphasised.
- Federal role could be to help smaller provinces with funding their network.
- Establish workshops to try to introduce collaboration between provincial monitoring groups.
- Collaboration : develop 'consistency' rather than 'standards'.

Group 4: **Scientific program II: Outreach, information and training**
Leads: David Sharpe and Nga de la Cruz

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3. What information do Canadians need to place priorities for groundwater allocation among ecosystem requirements, human drinking water, agriculture, & other uses for groundwater?

Need a wide range of information and a higher level of details.

- Basic Info : What is groundwater? Where? How does it works?
- Info on water budgets and boundaries
- Info on use of groundwater
- Info on how to assess impacts on ecosystem (e.g. Middle East allocation)

4. How do we ensure that the information is in a form that maximises its use?

Wide range of base (raw) data to process results

- Format : digital to graphic
- Network of people and experts to interpret and explain information (e.g. Health authorities –lab results)
- Advisory Council –index of where to go for basic groundwater information
- fact sheets issued with water bill

5. Who should do what, and how can we optimise education and outreach programs?

Need all available means

- Flyers, fact sheets, web sites and other info sources.
- Range of strategies :
  - focussed groups
  - town fairs
  - community stewardship
  - mass target
  - TV ads.
- Engage teachers and educators
  - Workshops
  - flow models
  - lesson plans
- Marketing plan (TV)
- Target audience (rural residents)

2. **What approach to supplying groundwater related information should be taken: organise, standardise and make existing data widely available (provide examples) or collecting new data and information (provide the primary information gaps that should be tackled)**

Mine existing data and strategic new data

- Use existing data to gain understanding and identity gaps (e.g. ww records)
- Use existing and new data
  - water surveys
  - need new monitoring
  - flows, levels (e.g., USGS website)
- Public and community participation - money
  - e.g., monitoring - quality?

1. **Discuss needs & roles among government, industry and academia regarding training and standards**

Minimum standards : National consistency

- Government establishes requirements - standards
- Academic institutions and professional association - provide training and accreditation
  - e.g. electricians certificate is national
  - well drilling
  - water supply treatment
- Speciality and broad training (e.g. land use changes in watershed)

APPENDIX 4

Report from the Observer Panel

Jim Miller, Agriculture, soil scientist, groundwater, in particular for land use.
Ken Howard, University of Toronto.
Keith Guzzwell, Dept. of Environment, Gov. of Newfoundland and Labrador.

Presentation by Jim Miller

Vision, goals and objectives :
Seem OK but needs rewriting, too many, too ambitious.
Goals should be prioritised. Goals 1 and 2 seem a priority. There should be consistency between the different goals. Jurisdictional priorities must be addressed.

Co-ordination/Collaboration mechanisms:
The concept of co-ordination was a consensus : Federal, provinces, municipalities, industry. Municipalities are very important. There should be a representative from municipal governments or local health units on the council.

Scientific program I:
Scale is an important element in regional groundwater flow. Local is usually the focus, regional is not very well defined, may impact how to orient efforts. Vulnerability is an issue. Monitoring network is not very clear,

Scientific program II:
Outreach : agreement on a wide range of medias. Networking, linkages, collaboration between levels of government is a consensus. Local health should be part of process. Quantity and quality of groundwater are both concerns. Protection, sustainability, vulnerability, jurisdiction, land use, public awareness. Compile existing databases. Walkerton, pathogen issues came up many times Vs agriculture, pesticides, fertilisers.

Presentation by Ken Howard

1. Overall initiative

- Sense generally strong support for the initiative.
- Strong belief that the status of groundwater needs to be raised and given a national profile (c.f. oil / minerals / forestry) and that the initiative can achieve this.
- However, it is still very much a work in progress
- The degree to which the initiative affects, influences and determines policy is clearly controversial (this issue needs to be resolved).

2. The document itself

- It is somewhat of a problem, its content is generally uncontroversial.
- Personally, find it: unconvincing, difficult to read, clearly an « inclusive » consensus document which reduced its potential impact, lacked strong introduction and vision, lacked succinct goals that would achieve the vision.
- some confusion between goals, objectives and tasks?, action?
- Some contradiction : all groundwater? only priority areas?
- Issues of funding and costs treated too superficially
- Issues regarding database ownership and management also treated superficially
- The potential role of IAH (the National Chapter) and GQS a large and valuable resource is ignored. They should be represented on the advisory Council's Executive Committee.

3. Document Structure

- Introduction : Why is groundwater important to this country? Hard-Hitting!
- Vision : «Improving knowledge base….. » is not likely to sell. Where do we want and need to be in 10, 20 or 50 years? Sustainable supplies of groundwater, effectively managed and protected.
- Why are we unlikely to achieve this vision. State of the « practice » 10 to 20 years behind much of the developed world. Lack of base data and maps etc. Gloom & Doom! e.g. Walkerton
- Low profile of groundwater amongst public and governments
- Failure of previous initiatives, e.g. the Gilliland and GSC documents.

4. Calvary arrives

THE SOLUTION

- Objectives and goals (as per breakout group results)
- Tasks and actions, tied to those objectives
- Timelines

Details
- Co-ordination & Collaboration
- Programs
- Etc.

Document should be tight, concise, and supported by appendices

Presentation by Keith Guzzwell

Notes that this document is a big move forward.

Vision, goals and objectives :
Lots of comments on changing some items but generally the Vision, Goals and Objectives are reasonable.

Co-ordination/Collaboration mechanisms:
Overall agreement on federal-provincial executive.

Scientific program I:
As front line stakeholder, recognises the need for top quality data and information. Three priorities: regional assessments, how to disseminate information, hydrogeological boundaries. Regional assessments should address quantity, quality, and vulnerability.

Scientific program II:
No debate on outreach and training, must only decide on the most pertinent actions.

APPENDIX 5

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