



# Newfoundland and Labrador GEOSCIENCE NEEDS WORKSHOP

(November 2-3, 1998, St. John's, NF)



## REPORT OF THE CHIEF FACILITATOR

John M. Fleming, P. Geo.  
Resource Concepts Inc.

December, 1998

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GOVERNMENT OF  
NEWFOUNDLAND  
AND LABRADOR

Department of Mines and Energy



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**Geological Survey of Newfoundland & Labrador  
Geological Survey of Canada**

**GEOSCIENCE NEEDS WORKSHOP**

**November 2 & 3, 1998  
St. John's**

**Report of the Chief Facilitator**

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## **PREFACE**

*The Geoscience Needs Workshop conducted November 2 and 3, 1998, in St. John's, was a joint initiative of the Geological Survey of Newfoundland and Labrador (GSNL) and the Geological Survey of Canada (GSC). The workshop was planned and organized largely by the GSNL on behalf of both organizations.*

*As Chief Facilitator, engaged by the GSNL, my role was primarily to act as general chairman for the workshop, to coordinate the work of the breakout session facilitators, and to prepare this report. In addition, I participated in the workshop preparation process by providing input to the Planning Committee on the overall design of the workshop and by joining the other facilitators in preparatory training given by the Newfoundland & Labrador Public Service Commission.*

*The members of the Planning Committee were particularly concerned that the workshop be designed so as to ensure that participants were given all the information and access to staff of the two Surveys needed for their deliberations, without putting any constraint on free and open discussion. In my opinion, the organizers succeeded in giving the participants the opportunity to express their views fully, within a well organized setting. Judging by comments from several participants, I think my view is widely shared.*

*I very much appreciated the opportunity to have been involved in what one commentator called "a brave thing to do". It was a distinct pleasure to work with Frank Blackwood, Director of the GSNL, and the Workshop Planning Committee. I want to thank also the breakout session facilitators, who all undertook this novel role with enthusiasm and professionalism, and who, in my view, fully succeeded.*

*Frank Blackwood and his staff have been most helpful in preparing this report. That said, the report is mine; I hope it adequately captures the views expressed in the workshop but if it fails in any respect, it is my responsibility.*

*John M. Fleming  
Resource Concepts Inc.*



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## 1.0 WORKSHOP PURPOSE AND ORGANIZATION

### 1.1 Background

The Geoscience Needs Workshop represents a further evolution of a long-standing practice of the Geological Survey of Newfoundland and Labrador (GSNL) and the Geological Survey of Canada (GSC) to obtain advice from their clients<sup>1</sup> and to tailor their programs accordingly. Successive independent Technical Liaison Committees were utilized to advise on programs conducted under the federal/provincial Mineral Development Agreements that operated from the mid-1970's to the mid-90's. These Committees focused primarily on mineral industry needs. At the national level, the GSC benefits from the advice of the Minister's National Advisory Board on the Earth Sciences.

Following discontinuation of the Mineral Development Agreements across Canada, the GSC and the provincial and territorial geological surveys developed other mechanisms for collaboration. In 1996, Canada's ministers of mines signed the Intergovernmental Geoscience Accord, which established principles for cooperative effort and which provides for bilateral federal/provincial agreements. A Memorandum of Agreement (MOA) between the GSNL and the GSC was signed in 1998. Among other things the MOA requires;

- formation of a joint Geoscience Programs Committee whose first responsibility is to conduct a Geoscience Needs Study for the province; and
- establishment of an independent Joint Technical Advisory Committee, representing the mineral industry and other client groups, to advise the Surveys on the development and implementation of programs in light of the Geoscience Needs Study.

A copy of each of the Intergovernmental Geoscience Accord and the Memorandum of Agreement is included in Appendices A and B, respectively.

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<sup>1</sup> There was some concern expressed during the workshop about the use of the term "client", in that the term might be taken to imply someone who is required to pay directly for products and services rendered. The term, as used in the workshop materials and in this report, should be understood to mean merely a person or group who avails of the products and services of the GSNL and/or the GSC, without cost- or price-related connotation. Other terms used with the same connotation include "client groups", "users", "user groups", and "consumers".

## 1.2 The Workshop

As the first step in the Geoscience Needs Study, the Geoscience Programs Committee decided to conduct a workshop with representatives of the groups and organizations who use the products and services of the two Geological Surveys. The objective set for the workshop was to determine, as fully and accurately as possible, the geoscience needs of the Surveys' clients. The idea was to involve as broad as possible a range of the client groups, including all companies, agencies, institutions and individuals who look to the Surveys to provide products and services emanating from the geoscience knowledge base that the Surveys strive to maintain and improve.

Organization of the workshop was the responsibility of the GSNL. A Workshop Planning Committee was established in April, 1998 (see Appendix C) and initially canvassed a list of more than 200 stakeholders as to interest in the planned workshop and preferences with respect to timing. The response suggested a high level of interest with 87 persons indicating an intention to participate. The workshop dates were set at November 2 and 3, 1998, just prior to the Mines Branch Annual Review of Activities and the Annual Meeting of the Newfoundland Branch of the Canadian Institute of Mining and Metallurgy, thereby meshing with the travel plans of many potential participants.

A significant part of the Planning Committee's work was the preparation of a portfolio of comprehensive information on the two Geological Surveys, including financial data, program and activities information, index maps showing the status of geoscience databases, as well as the workshop agenda and related information. The portfolio of information was packaged in a binder, a copy of which was sent to all 87 persons on the preliminary list of workshop participants. (See Appendix D for the full Table of Contents of the information binder.)

Forty client participants registered at the workshop, most of whom participated in the full two-day agenda. They were joined by some 27 GSNL personnel, representing most of the GSNL's scientific staff, and 16 senior managers and geoscientists from the GSC. The majority of the discussions during the workshop focused on the programs and activities of the provincial Survey, reflecting the primary interests of local clients. Accordingly, many of the comments recorded in the body of this report also refer more to the GSNL than to the GSC. Appendix E is a list of the participants.

The workshop agenda is shown in Appendix F. The workshop opened with overview presentations from representatives of both Geological Surveys. The participants were divided into four groups for each of two sets of breakout sessions that constituted the core of the workshop. For the breakout sessions on Day 1, which focused on overall strategic directions of the Geological Surveys, the groups were constituted so that the client participants in each group represented a range of diverse interests and needs. On Day 2, the groups were reconstituted to represent relatively homogenous interests, to discuss the needs of particular client groups. A plenary session followed each set of breakout sessions.

Each breakout group was supplied with a two-person facilitation team, drawn from the GSNL geoscientific staff (see Appendix C). Also, personnel from both the GSNL and the GSC were assigned as resource persons to the breakout groups.

Facilitators' notes from each of the breakout sessions and the plenary sessions are the basis for the discussion of workshop results in this report. The report is to be sent to the two Geological Surveys, each member of the Technical Advisory Committee, and each workshop participant.

### **1.3 Questionnaire**

To supplement the results of the workshop, the Planning Committee designed a Needs Study Questionnaire, which was sent to the more than 200 persons who were invited to the workshop. All were requested to complete the questionnaire, whether or not they participated in the workshop.

Appendix G contains a summary analysis of the questionnaire responses.



## 2.0 WORKSHOP RESULTS

### 2.1 Introduction

The subsequent sections of this chapter comprise an account of the results of the workshop based on notes taken by the facilitators in the breakout sessions and the plenary discussions over the two days of the workshop. The account also incorporates comments received in written communications.

The account is organized in the first instance under headings corresponding to the topics that were addressed in each of the two sets of breakout sessions (i.e., Day 1 – Strategic Directions, and Day 2 – Specific Client Needs). Under these main headings, the discussion is then organized under subjects corresponding to the questions that each breakout session group was asked to address. The questions were:

#### Day 1 Breakout Sessions

##### STRATEGIC DIRECTIONS – The Client’s Perspective

- 1) Do you think the present scope of the GSNL and GSC activities is appropriate and adequate?
- 2) What should the “core” and “peripheral” survey activities be?
- 3) What activities require more effort? Which may be scaled back?
- 4) Who should be the lead agency, the GSNL or the GSC, for each main activity? Which activities should be jointly delivered?

#### Day 2 Breakout Sessions

##### SPECIFIC CLIENT NEEDS – Establishing your priorities...

- 1) What survey (GSC and GSNL) activities and products are most useful to your user group? Are they easily accessible?
- 2) Which survey activities would you like to see expanded? Why?
- 3) What parts of the Province (including the offshore) should receive highest priority for single or multidisciplinary studies (short and long term)?

In the interest of producing an account of the workshop with a sense of logical consistency, issues are discussed here under the headings and questions to which they appear to best relate. Actual discussion on those issues in the workshop itself might have occurred at various points in the agenda.

A short section is included on the results of the questionnaire and how they relate to the workshop discussions.

Issues raised that do not readily fit within the subject areas denoted by the workshop questions, or which fall outside the mandates of the Surveys, are noted in a final section titled "Other Issues".

## **2.2 Strategic Directions**

### **Scope of Activities (Question 1)**

The discussions on the present scope of the Surveys' activities elicited general comments of satisfaction with the major priorities of the Surveys, and also responses indicating a number of qualifications and exceptions to that view. In general, it appears that the current scope of activities addresses the needs of the mineral industry, with some important qualifications, but the needs of other groups demand attention. Specific issues addressed were:

- The current principal activities of the GSNL and corresponding activities of the GSC – i.e., bedrock and surficial mapping, geochemical and geophysical surveys, mineral deposits studies, and related information functions – continue to be fundamental.
- While continuing to concentrate on the basics, the Surveys need to be able to respond in a flexible manner to industry and public needs. They should avoid becoming locked into fixed multi-year plans.
- The discussion recognized that there are considerable pressures for broadening the Surveys' scope of activities significantly. Among the factors and needs discussed were;
  - the ever broadening scope of earth science itself;
  - the need to integrate geoscience information into land use and socio-economic planning;
  - the need to make geoscience information more available and accessible to the general public;
  - increasing demand from the environmental sector;
  - the need for a provincial geoscience library, a one-stop browsing and supply centre;

- demand for regional geoscience information offices and for more online information;
- increased emphasis on raising the geoscience profile of the resource industries and for more hands-on assistance to industry, particularly the junior sector; and
- the demand for more attention to marine and petroleum geoscience needs.

It was recognized, however, that these demands can only be met with increased resources. There is also concern that any significant broadening of activities not adversely affect the quality and timeliness of deliverables. As long as resources are constrained, the Surveys should concentrate on doing fewer activities well.

- There is widespread and strongly held opinion among representatives of the petroleum industry that the confusion of mandates between GSNL/Energy Branch/CNOPB is a hindrance to petroleum geoscience. Lack of resources plus confusion of mandates mean that their geoscience needs are not being met by Government.
- It is evident also that non-industry groups regard the GSNL as the provincial agency best equipped to exercise leadership in encouraging and facilitating cooperation and collaboration in building an integrated natural science database for the province.
- There is concern at the amount of GSNL resources dedicated to bedrock mapping projects and the need to balance this with attention to other activity areas.
- There is an evident demand for much increased, systematic geophysical surveys. In particular, there is a view that bedrock mapping could be made more effective by better aeromagnetic coverage. Aeromagnetic surveys are also directly useful to industry.

### **“Core” Versus “Peripheral” Activities (Question 2)**

There was considerable discussion and some unease about classifying any geoscience activities as “peripheral”. Rather, the discussion focused more on determining relative priorities. The principal results were:

- There was general agreement that field surveys – including bedrock and surficial mapping, and geochemical and geophysical surveys – are essential. Continued field work is needed to fill the gaps in basic data coverage.

- Priority should be given to basic descriptive work. The industry emphasizes the continuing need to have maps show data points and the locations of gossans and other mineral occurrences.
- Agreement on the above, however, was qualified by remarks that detailed studies – e.g., geochemical and geophysical work at the property level – should be left to industry. This is the one area where there was little apparent reluctance to relegate an activity to the “peripheral” category.
- Providing ready access to geoscience data is also a core function.
- There was strong representation in favour of regarding environmental geoscience as a core activity of the Surveys, considering the importance of environmental issues to economic development and human health considerations.
- There was strong agreement that work to promote public awareness of geoscience and related issues is essential.
- Assistance to prospectors, especially on a personal, one-on-one basis, should be considered essential.

### **Geoscience Activities - Relative Level of Effort (Question 3)**

As in the discussion on “core” versus “peripheral”, consideration of which activities deserve “more” versus “less” effort tended to focus on the positive end of the spectrum. The primary issues raised were:

- Somewhat at odds with the discussion on the need for more balance between bedrock mapping and other activities (see *Scope of Activities* above), in this context there was a recommendation for more effort in regional mapping, even if at the expense of other activities such as mineral deposit studies. Reinforcing a previous point, however, was a recommendation for more geophysical, especially aeromagnetic, surveys in support of regional mapping projects.
- Balance is needed between mapping areas of known high mineral potential versus areas that are poorly known.
- There was a great deal of emphasis on the need for more integration of data and effort at several levels;
  - integration of multiple geoscience data sets;
  - better integration of effort between the GSNL and the GSC (it was noted that GSC activities in the province appear to be conducted independent of the GSNL);



- integration of geoscience disciplines in more multi-disciplinary projects; and
  - integration of geoscience data with land use, land ownership, water resources and other data.
- Adequate resources need to be devoted to ensuring that geoscience staff remain current. This includes providing for field trip and conference travel outside the province, and computer support.
  - Put more effort into freeing up funds for priorities by sharing services between the two Surveys – e.g., in laboratory services and publications distribution, by better joint planning and coordination, and reducing costs in areas such as publications.
  - More effort required in geophysical method development.
  - Near shore bedrock mapping and integration of those data with onshore mapping are needed.
  - Increased ship time for offshore geoscience research.
  - Increased availability of data in digital form and enhanced online access.
  - Devote more effort to public information.
  - More effort at interagency communications and sharing of data within government.
  - Making data available more quickly whether in map, report or other forms.

#### **Lead Agency (Question 4)**

As a general principle, the view was expressed that the decision as to which agency should take the lead for any given project should be decided on purely pragmatic grounds – i.e., whichever of the GSNL or the GSC is in the best position to carry out the project. That said, there was general agreement that activities should be allocated between the two Surveys as follows:

- The GSNL should generally take the lead on terrestrial geoscience studies, especially bedrock mapping, and geochemical and geophysical surveys at more detailed scales.
- The GSC is the appropriate lead agency for reconnaissance scale studies and should be the principal agency responsible for geochemical and geophysical method development.

- Subject to availability of resources, the GSNL should take a role in marine geoscience and work collaboratively with the GSC in onshore – offshore integrative work, in Quaternary mapping and assessment of marine placer deposits.
- The two organizations should collaborate in providing “one-stop” access to their products and services in the province.

### **2.3 Specific Client Needs**

As mentioned earlier, the breakout session groups were reconstituted for the Day 2 discussions on the needs of specific client groups. Of the four groups, one comprised primarily people whose main interest is in petroleum and marine geoscience. The other three groups were dominated by mineral industry representatives with academics and representatives of other government departments distributed throughout.

In the following accounts of the discussions under the three subject areas (questions) put to the breakout groups, results are presented in a tri-fold listing according to their relevance to:

- the mineral industry,
- the petroleum industry, and
- other interests.

#### **Activities & Products – Usefulness & Accessibility (Question 1)**

##### **Mineral Industry:**

- Bedrock mapping is probably the most useful service.
- Maps are generally high quality.
- Available airborne geophysics data are generally too coarse. Higher resolution data are required.
- Industrial minerals studies are important but must be based on good market studies.
- Regional geochemical coverage is good. The geochemical atlas gets high praise. However, there is some concern about the reproducibility of the data.
- Geochronological and paleontological work are important for a variety of use groups.
- The geofiles are useful, but accessibility can be a problem. Some microfiche files are illegible. Archiving of data is a major concern. Web access to the geofiles needs to be promoted.

- More data are needed in non-customized digital format. Revisit older data and re-release in digital form.
- Integrate geoscience and claims data and provide online remote access.
- Need more frequent updates to the claims map on the Web site. It was recognized that this is a Mineral Lands Division, not a GSNL, responsibility.
- Core libraries should be maintained and upgraded, although it was recognized that these are no longer the responsibility of the GSNL.
- Reporting is generally both timely and adequate. *Current Research* is useful but some of the maps included are inaccurate. *Current Research* could be made available in electronic format.
- The GSNL's Report of Activities is not useful and should be discontinued.
- The GSNL's memoir series is useful as the "final word" and data repositories on projects.
- Digital data, where available, are widely used and should be expanded. Paper maps, however, are important also.
- The GSNL should increase the regional availability of its publications, perhaps through the Government Service Centres or the Forestry offices.
- The GSNL Web site could be enhanced by adding publications available on the Net and by adding a search engine. The British Columbia site is a good example to follow.

Petroleum Industry:

- Useful activities include;
  - Regional syntheses involving integration of bedrock mapping and paleontological studies with seismic surveys.
  - Work by Ian Knight and co-workers on Humber zone stratigraphy has been invaluable.
  - Shallow seismic combined with shallow coring in near shore areas.
- GSNL's *Current Research* is timely and valuable. More synthesis articles would be helpful. Also *Current Research* could be indexed, making a useful and searchable database.
- The MODS database and the geofiles are valuable.

- Accessibility of data is a problem. The GSNL is devoting few resources in this area and records at the Canada/Newfoundland Offshore Petroleum Board (CNOBP) are difficult to access.

#### Environmental, Land-Planning and Related Users:

- Surficial geological mapping and aggregate resources evaluations are useful for road construction purposes. Both products are readily accessible.
- There is much information from the two Surveys of interest to groups other than the mineral and petroleum industries – e.g., glaciation history, sea level change, lake and stream geochemistry. However, the data need to be made available in easily understood format.
- Seabed surficial mapping.
- The relevance of the GSNL to non-mineral-industry groups needs to be promoted.

#### Activities - Priorities for Expansion (Question 2)

##### Mineral Industry:

- Bedrock mapping projects should not be allowed to proceed unless detailed aeromagnetic data are available.
- A continuing program of regional airborne geophysics to obtain uniform and standard coverage across the province. Radiometric surveys are valuable. Gravity data from mineral exploration should be released as soon as permissible.
- Geophysical surveys should be aimed at detection of anomalies, in order to stimulate exploration.
- Integrate geophysical data sets, with basic interpretation, and perhaps make available on CD-ROM.
- Surficial mapping to aid geochemical interpretation.
- Thematic studies in areas of high mineral potential are needed but careful planning is essential. Involve all stakeholders in the planning.
- Increased dimension stone and mineral aggregate potential studies.
- GSC and GSNL presence at all local professional and industry-related meetings – e.g., APEGN, offshore meetings, etc.

- Public awareness and education activity. The proposed Johnson Geoscience Centre should be supported.
- Internet access to geofiles, perhaps with the ability to pay via credit card.
- Address current problems with archiving files.
- The GSNL should make talks in its winter seminar series more widely available, perhaps in association with local branches of the Canadian Institute of Mining and Metallurgy.
- The GSC should increase awareness of its presence in the province through increased participation in the GSNL's Review of Activities, and by providing better access to its information through a combined GSC/GSNL publications office.

#### Petroleum Industry:

- Regional synthesis studies.
- Geophysical interpretation on a regional scale.
- Onshore seismic surveys.
- Source rock studies.
- Offshore resource assessment through GSC/GSNL collaboration.
- Efforts should be undertaken to promote public awareness of activities related to the petroleum industry. The contrast with the GSNL efforts to promote the mineral industry was noted.

#### Environmental, Land-Planning and Related Users:

- Increased cooperation needed with the Department of Works, Services and Transportation to develop a digital database of pits and quarries.
- Provide increased support for geo-tourism, via the provincial tourism guide perhaps.
- More coastal zone work to provide data in relation to aquaculture development, offshore aggregates, and placer deposits.
- Swath bathymetry is needed but surveys need careful planning and prioritizing.
- The GSNL should initiate a new publication series to present the results of geoscientific research to the general scientific community and the public at large.

- Initiate interdisciplinary workshops and a natural science seminar series involving researchers in other disciplines.
- Use the GSNL's expertise and capabilities in GIS technology to build a natural science database for the province.
- Develop criteria for the selection of geologically important sites for inclusion in the province's protected area system. Take the lead in ensuring that geological components of ecosystems are adequately represented in protected areas and act as scientific advisor in the management of such sites.
- Develop objective methods of mineral potential assessment and, using these methods, begin systematic production of mineral potential maps.

### **Priority Areas (Question 3)**

#### **Mineral Industry:**

- The Lower/Middle Paleozoic sedimentary basins of Central Newfoundland, and the relationships with volcanic rocks. Also might look at the basement mineral potential in these same areas, if it can be done cost effectively.
- Mapping of anorthosite complexes in the Grenville.
- The Seal Lake Group, Central Mineral Belt of Labrador.
- The Aillik Group, Central Mineral Belt of Labrador.
- The Grenville inlier on the Great Northern Peninsula.
- The Burin Peninsula could see some follow-up lake sediment geochemistry and surficial mapping to better place anomalies in a regional context.
- The Buchans –Robert's Arm belt, central Newfoundland.
- Study of the mafic and ultramafic rocks of the Island and Labrador.
- The Baie Verte Peninsula.
- Proposed park and reserve areas.

#### Petroleum Industry:

- Sedimentary basins of western Newfoundland.
- The East Coast offshore outside the Jeanne D'Arc Basin.
- The White Bay Carboniferous Basin and other basins of unknown potential.
- Complete the mapping of the Humber Zone.

#### Environmental, Land-Planning and Related Users:

- Aggregate mapping in southern Labrador in support of planned road construction.
- The proposed Bonavista – Funks Marine Reserve.

## **2.4 Questionnaire Results**

Appendix G contains a presentation and analysis of the questionnaire responses. For the most part, they reinforce the recommendations arising out of the workshop discussions. They also identify geographic areas, in addition to those mentioned in the workshop, where additional geoscientific work is needed.

Two additional issues arising out of the questionnaire responses are noted:

- Mineral deposit studies, which received little attention in the workshop, are indicated as being very useful. That applies to all types of mineral deposit studies including studies of individual deposits, mineral belts, regional metallogeny, deposit types and the Mineral Occurrence Data (MODS) inventory. Some attention to quality may be required, however, as some studies are apparently regarded as only of moderate quality.
- The questionnaire responses reinforce the need, identified in the workshop, for marine and coastal- zone geoscience surveys. However, the responses reveal, in addition, some concerns with either the "... quality of the service or product." (See Question 11). It is difficult to determine from the context of the question whether the concern is with the level of service, the quality of the products, or some other issue.

## 2.5 Other Issues

Issues raised that fall outside the mandates of the two Geological Surveys or the workshop include recommendations:

- That the GSNL should be involved in monitoring private-sector geoscience education programs. The Survey should continue its efforts to foster and support geoscience education in the school system.
- For increased financial assistance to prospectors.
- For another meeting to discuss the specific needs of the petroleum sector.
- That a representative of the Newfoundland-based petroleum industry be appointed to the Technical Advisory Committee.



### 3.0 SUMMARY CONCLUSIONS

If there was ever any doubt about the value to the province of the work of the Geological Survey of Newfoundland and Labrador and the Geological Survey of Canada, surely it must be dispelled by this Geoscience Needs Workshop. The workshop drew wide and committed interest. The Organizing Committee, it is true, had hoped for greater numbers, but the some forty client participants included especially strong representation from industry and an eclectic mix of other interests. Perhaps the one disappointment was the sparse representation from other government departments. Otherwise, participation was noteworthy not only in its variety but in commitment, with virtually all the registrants actively involved throughout the full two days.

The account of the results of the workshop in the previous chapter attempts to report, as far as possible, each need expressed, even if it represents a minority view. Needs expressed by a strong majority are indicated by the language used. The following, however, are the writer's conclusions as to the strongest messages emerging from the Workshop based on the Workshop proceedings and related discussions.

- The mineral industry values the work of the two Surveys very highly and relies heavily on their products and services. The locally based junior mining sector, itself partly the result of successful government policy, is especially dependent not only on the information products of the Surveys but on the personal advice and mentoring that Survey geoscientists provide.
- The emerging local petroleum industry is looking to the Surveys to provide it with similar support.
- The traditional core programs of the Surveys continue to be highly valued. Clients are looking for continuation and strengthening of those core programs but also want the Surveys to be able to respond quickly and flexibly to changing trends and needs.
- The strongest demand for new or increased activity is in geophysics where systematic coverage, especially aeromagnetic coverage, is being advocated.
- Interest in the work and capabilities of the Surveys is becoming much more widespread among non-industry groups and the general public. There is a growing appreciation of the value of geoscientific information for land-use planning and environmental purposes. This will influence not only what priorities the Surveys address in their programs but how they communicate the results of those programs. The Surveys must make the information they have more accessible to the public. Also, the resource industries and the wider geoscientific community want the Surveys to take a more active role in promoting public awareness and education of geoscience and resource issues.

Finally, there are some overriding issues that are not discussed in the previous chapter, because they fall somewhat outside the strict mandate of the workshop, but which must be addressed.

- Repeatedly throughout the workshop, participants noted that the programs of the GSNL will inevitably decline unless action is taken to recruit new, young geoscientists. Budget reductions have precluded any new hiring for several years. Most of the active geoscientists remaining fall within a narrow age range and many will be eligible for retirement in just a few years. (The mean age of GSNL geoscientists is 45 years.) The GSNL's clients feel very strongly that the problem must be addressed urgently. New blood must be injected into the system while the senior geoscientists are still available to provide the mentoring necessary to ensure continued evolution of viable programs. Otherwise, not only the GSNL as an institution is threatened but the industries it serves.
- The issue of cost recovery as a possible method for finding new program funding was raised at several points in the proceedings. The idea elicits different reactions from different client groups. Many clients, especially those in the junior mining industry, feel that Survey programs are for the public good and should be funded out of general tax revenues. The reaction of that group to the notion of cost recovery, other than nominal fees to cover publication and distribution costs, is adamantly negative. On the other hand, some clients, while not advocating cost recovery across the board, would like the Surveys to investigate the possibility of partnerships with industry clients as a way of funding higher cost programs. Costly geophysical programs were mentioned as one area where a partnership approach might be productive.
- The services demanded by the local petroleum industry could only be met by the GSNL if the mandate of that organization is widened and it receives commensurately increased resources. The agencies that currently have a petroleum industry mandate either have no local presence (i.e., the Geological Survey of Canada) or lack the necessary resources to do so (i.e., the Energy Branch, Department of Mines & Energy, and the Canada/Newfoundland Offshore Petroleum Board). In the writer's opinion, the geoscience needs of the petroleum industry can be met most effectively and efficiently by increasing the capability of the GSNL.
- The lack of a permanent GSC presence in the province came up also in other areas, notably in discussions about the availability and distribution of publications and other services. Most clients care little for jurisdictional niceties. They want to see the products and services they need provided by whichever agency is in the best practical position to do so. They look to the only agency with a local presence, the GSNL, to provide access to the products and services of both Surveys in a one-stop shopping facility.

**APPENDIX A**  
**INTERGOVERNMENTAL GEOSCIENCE ACCORD**



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**INTERGOVERNMENTAL GEOSCIENCE ACCORD**

**ACCORD GÉOSCIENTIFIQUE INTERGOUVERNEMENTAL**

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**53rd. Annual Mines Ministers' Conference  
Yellowknife, Northwest Territories  
September 17, 1996**

**53e. Conférence annuelle des Ministres des Mines  
Yellowknife, Territoires du Nord-ouest  
17 septembre 1996**

## INTERGOVERNMENTAL GEOSCIENCE ACCORD

### INTRODUCTION

With the changing demands upon governments for geoscience information, and recent major reductions in support for geoscience in Canada at the federal and provincial levels, including the withdrawal of the Mineral Development Agreement programs, there is a need to review the roles and responsibilities of the federal, provincial and territorial geological survey organizations, and to establish new principles and mechanisms of cooperation that will maximize benefits to Canada.

#### 1. PURPOSE

1.1 The purpose of the Intergovernmental Geoscience Accord (hereafter, the Accord) is to focus the strengths and increase the effectiveness of government geological survey organizations in Canada by:

- defining their different but complementary roles and responsibilities;
- outlining principles of cooperation that will optimize utilization of resources among all of the geological survey organizations;
- establishing mechanisms to optimize cooperation and collaboration among the geological survey organizations.

## ACCORD GÉOSCIENTIFIQUE INTERGOUVERNEMENTAL

### INTRODUCTION

Comme, d'une part, les gouvernements doivent répondre à de nouveaux besoins en matière d'information géoscientifique et que, d'autre part, des compressions majeures ont diminué récemment l'appui consenti aux activités géoscientifiques par les gouvernements fédéral et provinciaux, notamment par l'abolition des ententes sur l'exploitation minière, il convient d'examiner les rôles et les responsabilités des commissions géologiques fédérale, provinciales et territoriales et d'établir de nouveaux principes et mécanismes de collaboration qui permettront à ces organismes de servir au mieux les intérêts du Canada.

#### 1. OBJET

1.1 Le présent Accord géoscientifique intergouvernemental (ci-après "Accord") a pour objet de concentrer les forces et d'accroître l'efficacité des commissions géologiques au Canada, par les moyens suivants:

- la définition des rôles et responsabilités des diverses commissions, qui sont différents, mais complémentaires;
- l'établissement de principes de collaboration qui permettront une utilisation optimale des ressources de l'ensemble des commissions;
- l'établissement de mécanismes qui permettront d'optimiser la coopération et la collaboration entre les commissions.

## 2. ROLES AND RESPONSIBILITIES

The Accord recognizes the following complementary roles of the Geological Survey of Canada, and the provincial and territorial geological survey organizations:

2.1 The Geological Survey of Canada carries out national geoscience programs to define the geology and resources of Canada. These programs are typically thematically based, and national or broadly regional in scope and significance. They are operated across Canada, and include aspects of fundamental research, technology development and information transfer not contained in the programs of all of the provincial and territorial survey organizations. In addition to its activities on land, the GSC operates marine and coastal studies that are unique among the geological survey organizations. The GSC also has a lead role in representing Canada in international geoscience activities.

2.2 The provincial and territorial geological survey organizations carry out programs specific to the economic development and resource management of their own jurisdictions. These programs are carried out at a scale appropriate to addressing provincial or territorial responsibilities, and are geographically limited to the jurisdiction over resources, environment and land of the province or territory. They contribute to a systematic description of the geology of the provinces and territories, including their mineral and energy endowment. Provincial and territorial programs are largely directed toward sustainable economic development and are closely linked to the local needs of clients. They are also related to provincial and territorial land use and social issues.

## 2. RÔLES ET RESPONSABILITÉS

L'Accord reconnaît les rôles complémentaires suivants de la Commission géologique du Canada et des commissions géologiques provinciales et territoriales:

2.1 La Commission géologique du Canada (CGC) exécute des programmes géoscientifiques nationaux dont l'objet est de définir la géologie et les ressources naturelles du Canada. Ces programmes sont pour la plupart thématiques et ont une portée nationale ou régionale étendue. Ils sont menés à divers endroits au Canada et portent sur des aspects de la recherche fondamentale, du développement technologique et du transfert d'information qui ne sont pas couverts par les programmes des commissions géologiques provinciales et territoriales. En plus de ses activités sur la terre ferme, la CGC mène des études uniques sur la géologie marine et côtière. La CGC a aussi pour fonction de représenter le Canada dans le cadre d'activités géoscientifiques internationales.

2.2 Les commissions géologiques provinciales et territoriales exécutent des programmes adaptés au développement économique et à la gestion des ressources de leur région respective. La portée de ces programmes dépend des responsabilités de la province ou du territoire et, du point de vue géographique, elle se limite à l'espace administratif dans lequel la province ou le territoire exerce sa compétence sur les ressources, l'environnement et les terres. Ces programmes contribuent à la description systématique de la géologie des provinces et territoires, ce qui comprend leurs ressources minérales et énergétiques. Les programmes provinciaux et territoriaux sont en grande partie orientés vers le développement économique durable et sont bien adaptés aux besoins des clients locaux. Ils portent aussi sur l'aménagement du territoire et sur des

questions d'intérêt social dans les provinces et territoires.

### **3. PRINCIPLES OF COOPERATION**

The following principles shall guide federal-provincial/territorial cooperation in geoscience:

3.1 All geoscience activities by the GSC within the provinces or territories will be planned in consultation and coordination with the appropriate provincial or territorial organization.

3.2 Geoscience activities proposed by the GSC within the provinces that are directly relevant to the provincial responsibilities for, and territorial interests in, mineral and energy resources and land management, will be conducted with the agreement of the province and in a collaborative manner.

3.3 If a province requests the GSC to undertake geoscience activities with the characteristics of a provincial program, as specified in Section 2.2, these activities will be undertaken through formal agreements with the province.

### **4. MECHANISMS FOR COOPERATION AND ACCOUNTABILITY**

Cooperation and accountability will be optimized through the following mechanisms:

### **3. PRINCIPES DE COLLABORATION**

Les principes suivants guideront la collaboration fédérale-provinciale/territoriale dans le cadre des activités géoscientifiques :

3.1 Toutes les activités géoscientifiques de la CGC dans les provinces et les territoires seront planifiées en consultation et en collaboration avec les commissions géologiques des provinces et territoires concernés.

3.2 Si la CGC se propose de mener dans les provinces des activités géoscientifiques qui ont un lien direct avec les responsabilités des provinces ou les intérêts des territoires en matière de ressources minérales et énergétiques et de gestion du territoire, ces activités seront exécutées avec l'accord des provinces et en collaboration avec elles.

3.3 Si une province demande à la CGC d'entreprendre des activités géoscientifiques ayant les caractéristiques de programmes provinciaux décrites à l'article 2.2, les activités seront réalisées dans le cadre d'ententes officielles avec la province.

### **4. MÉCANISMES DE COLLABORATION ET DE RESPONSABILISATION**

Les mécanismes suivants assureront une collaboration optimale entre les parties et feront en sorte que celles-ci assument leurs responsabilités respectives.



4.1 Bilateral accords may be negotiated between the GSC and the provincial and territorial survey organizations, where mutually desired. These accords may define mechanisms for the joint development of strategic plans to address the geoscience needs of the province or territory, for collaboration to plan and deliver programs to meet these needs, and for sharing of data.

4.2 The bilateral accords shall be tabled with the National Geological Surveys Committee (NGSC) for information, with the consent of the participating province or territory.

4.3 The NGSC will convene workshops at regular intervals to review the national geoscience program and to gather information to assist the GSC in setting national program priorities. The workshops will address all national program elements and will include participation by all NGSC members, industry clients and the universities.

4.4 The GSC and provincial and territorial survey organizations shall report their work plans to the NGSC annually for comment and discussion.

4.5 The NGSC shall monitor progress in the implementation of the Accord and submit an annual written report to the Intergovernmental Working Group on the Mineral Industry (IGWG) in a format to be specified by IGWG.

4.6 The term of the Accord is five years from the date of signing.

4.1 Si elles le souhaitent, la CGC et les commissions géologiques des provinces et territoires peuvent négocier des accords bilatéraux. Ces accords peuvent définir des mécanismes s'appliquant à des activités comme l'élaboration conjointe de plans stratégiques pour répondre aux besoins géoscientifiques de la province ou du territoire, la collaboration dans la planification et l'exécution des programmes répondant à ces besoins et, enfin, l'échange de données.

4.2 Les accords bilatéraux doivent être portés à la connaissance du Comité national des commissions géologiques (CNCG), avec le consentement de la province ou du territoire participant.

4.3 Le CNCG tiendra des ateliers à intervalles réguliers pour revoir le programme géoscientifique national et recueillir de l'information en vue d'aider la CGC à fixer les priorités de son programme national. Les ateliers porteront sur tous les éléments de ce programme. Y assisteront tous les membres du CNCG ainsi que des clients de l'industrie et des représentants d'universités.

4.4 La CGC et les commissions géologiques des provinces et territoires soumettront leurs plans de travail au CNCG chaque année pour commentaires et discussion.

4.5 Le CNCG surveillera la mise en oeuvre de l'Accord et présentera un rapport annuel au Groupe de travail intergouvernemental sur l'industrie minérale (GTIGIM) sous la forme précisée par le Groupe.

4.6 L'Accord a une durée de cinq (5) ans. Il entre en vigueur lorsqu'il est signé par les parties.

4.7 The Accord imposes no responsibility to assume any additional scientific program costs on any party.

4.8 The Accord does not create legally binding obligations between the parties but expresses their desire to cooperate and coordinate geoscience activities.

4.9 The Accord is entered into, and may be amended, renewed, or terminated by Ministers responsible for geological survey organizations.

4.7 L'Accord n'impose aux parties aucune responsabilité quant à des coûts additionnels pouvant découler de programmes scientifiques.

4.8 L'Accord ne crée aucune obligation légale entre les parties. Il ne fait qu'exprimer leur volonté de collaborer et de coordonner ensemble des activités géoscientifiques.

4.9 L'Accord est conclu par les ministres responsables des commissions géologiques, qui peuvent aussi le modifier, le renouveler ou le résilier.

*A. Anne McLellan*



Hon. Anne McLellan  
Minister of Natural Resources  
Government of Canada

*Rex Gibbons*



Hon. Rex Gibbons, P. Geo.  
Minister of Mines and Energy  
Government of Newfoundland and Labrador

*Barbara E. Ad*



Approved pursuant to the  
Intergovernmental Affairs Act by the  
Premier as Minister Responsible for  
Intergovernmental Affairs or the Secretary  
to Cabinet for Intergovernmental Affairs  
Government of Newfoundland and Labrador

*Eleanor Norrie*



Hon. Eleanor Norrie  
Minister of Natural Resources  
Government of Nova Scotia

*Albert Doucet*



Hon. Albert Doucet  
Minister of State for Mines and Energy  
Government of New Brunswick

*Chris Hodgson*



Hon. Christopher Hodgson  
Minister of Natural Resources, and  
Northern Development and Mines  
Government of Ontario



---

Hon. Stephen Kakfwi  
Minister of Resources, Wildlife  
and Economic Development  
Government of the Northwest Territories



---

Hon. Darren Praznik  
Minister of Energy and Mines  
Government of Manitoba



---

Hon. Eldon Lautermilch  
Minister of Energy and Mines  
Government of Saskatchewan



---

Hon. Patricia Black  
Minister of Energy  
Government of Alberta



---

Hon. Dan Miller  
Minister of Employment and Investment  
Government of British Columbia



---

Hon. Mickey Fisher  
Minister of Economic Development  
Government of Yukon



**APPENDIX B**  
**MEMORANDUM OF AGREEMENT**





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**MEMORANDUM OF AGREEMENT  
BETWEEN  
THE GEOLOGICAL SURVEY OF CANADA,  
NATURAL RESOURCES (CANADA)  
AND  
THE GEOLOGICAL SURVEY,  
NEWFOUNDLAND DEPARTMENT OF MINES AND ENERGY  
ON PROGRAM COORDINATION IN NEWFOUNDLAND**

**PROTOCOLE D'ENTENTE  
ENTRE  
LA COMMISSION GÉOLOGIQUE DU CANADA,  
RESSOURCES NATURELLES (CANADA)  
ET  
LA COMMISSION GÉOLOGIQUE  
DU MINISTÈRE DES MINES ET DE L'ÉNERGIE DE TERRE-NEUVE  
SUR LA COORDINATION DES PROGRAMMES À TERRE-NEUVE**



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**MEMORANDUM OF AGREEMENT  
BETWEEN  
THE GEOLOGICAL SURVEY OF CANADA,  
NATURAL RESOURCES (CANADA)  
AND  
THE GEOLOGICAL SURVEY,  
NEWFOUNDLAND DEPARTMENT OF MINES AND ENERGY  
ON PROGRAM COORDINATION IN NEWFOUNDLAND**

**OVERVIEW**

1. The purpose of this Memorandum of Agreement is to improve cooperation and collaboration between the Geological Survey of Canada (GSC) and the Geological Survey, Newfoundland Department of Mines and Energy (GSNL) in meeting the geoscience needs of Newfoundland, the national responsibilities of GSC, and addressing the client needs of both parties.
2. GSNL is responsible for providing a comprehensive, integrated geoscience knowledge base for the province, in support of mineral and hydrocarbon exploration and development, sustainable economic development in the non-mineral sectors, environmental protection, and land-use planning. To fulfill its mandate, GSNL must:
  - map the geological framework of the province and interpret and explain its geological evolution.
  - describe, interpret and explain the distribution, nature, quantity and origin of the province's mineral resources and provide current assessments of its mineral endowment, and describe and interpret the distribution and nature of potential hydrocarbon resources.
  - describe, interpret and explain the geological factors and processes that impact on public health and safety, and on environmental protection and land management.
  - maintain provincial databases on earth science, and disseminate information on the geology and mineral resources of the province.
3. The mission of GSC is to provide Canada with comprehensive geoscience knowledge, contributing to economic development, public safety, environmental protection and national sovereignty by acquiring, interpreting and disseminating geoscience information concerning Canada's landmass, including the offshore.
4. The responsibilities of the two organizations can be met most effectively and efficiently by using the complementary skills and competencies of GSC and GSNL. GSNL develops and interprets the geoscience knowledge base for the province, with the operational assistance of GSC where mutually advantageous, in light of the national and international knowledge base and standards, responsibility for which resides with GSC. Through such collaboration, GSC adds the provincial knowledge base to the national knowledge base. The programs of the





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two organizations are therefore mutually supportive. This agreement is designed to improve the effectiveness of that mutual support.

5. It is agreed that GSC and GSNL will endorse, as a fundamental principle of their cooperation, a commitment to mutual and efficacious sharing of all survey-held geoscientific data, information and knowledge that is not restricted by third-party interests. In the occasional item-specific circumstance where an obstacle to data sharing develops, both parties are committed to overcoming the obstacle as expeditiously as possible.
6. GSNL and GSC will establish a joint Geoscience Programs Committee to complete a study of geoscience needs in Newfoundland and Labrador. This study will establish priorities for future work. It is also agreed that GSC and GSNL will use these priorities to develop annual integrated work plans.
7. It is also agreed that a Joint Technical Advisory Committee will be formed to advise on program content and delivery, and to encourage coordination of the programs of GSC and GSNL to meet the needs of their client groups in Newfoundland.
8. The needs study, annual integrated work plans and other documents as agreed by both parties will form annexes to this Memorandum of Agreement.

## **GEOSCIENCE PROGRAMS COMMITTEE**

### **Membership**

1. The Geoscience Programs Committee will consist of three representatives of GSC and three representatives of GSNL. The GSC representatives will generally be senior staff (such as Directors) responsible for programs in (or relevant to) Newfoundland.
2. The Geoscience Programs Committee will be co-chaired by managers from GSC and GSNL, appointed by respective ADMs.
3. The co-chairs of the Geoscience Programs Committee are to be kept informed of the work of both GSC and GSNL related to the geoscience needs of Newfoundland in order that the objectives of the MOA are met and in order that each will obtain a more comprehensive understanding of the total geoscience needs to be satisfied by the two organizations. Also, the Committee will ensure that GSC projects and appropriate GSNL projects will have a designated provincial or federal geoscientist or official with whom effective communication must be maintained for the duration of the project.

### **Responsibilities**

1. The first responsibility of the Geoscience Programs Committee will be to carry out a study of the geoscience needs of Newfoundland, including those of client groups of both GSC and GSNL in the province. This study will initially address the programs of both organizations, and will be based on a 5 year term. The Geoscience Programs Committee will identify program elements and projects in which collaboration among GSC, GSNL, other agencies of the federal and provincial government, universities and industry will be beneficial.



2. The needs study will be reviewed by the Joint Technical Advisory Committee, the results of which they will discuss with the Geoscience Programs Committee. The Geoscience Programs Committee will then revise the needs study as it deems necessary in light of the advice of the Joint Technical Advisory Committee and submit it to the ADMs for approval, supplemented by any additional comments that the Joint Technical Advisory Committee may wish to append.
3. Upon completion of the needs study and its acceptance by the responsible ADMs, the Geoscience Programs Committee will be charged with developing annual integrated work plans for GSC and associated GSNL projects in Newfoundland and Labrador. The Committee will also be invited to review the remaining GSNL work plans. These work plans will reflect, within the constraints of overall GSC and GSNL responsibilities and obligations, priorities established in the needs study.
4. Annual integrated work plans will be reviewed by the Joint Technical Advisory Committee, which may recommend changes to the Geoscience Programs Committee before submission to the ADMs representing the two parties for approval.

#### **Meeting Schedule and Funding**

1. The Geoscience Programs Committee will meet at least once per year at a location chosen by the co-chairs, and at other times as necessary (possibly by conference calls).
2. Participation in the Geoscience Programs Committee will be at the expense of the participating organization.
3. Provision of secretarial support for the Geoscience Programs Committee will be equally shared by GSC and GSNL.

#### **Reports**

1. The Geoscience Programs Committee will prepare written semi-annual reports on its deliberations and decisions and provide them to the Joint Technical Advisory Committee and to the senior managers of both GSC and GSNL.

### **JOINT TECHNICAL ADVISORY COMMITTEE**

#### **Membership**

1. Non-government membership will be drawn from the client sectors of GSC and GSNL in Newfoundland so as to represent the client interests of both parties.
2. The committee will have approximately seven members. Initial appointments will be made for periods of one, two or three years. Future appointments will be for three years, to ensure appropriate rotation. The committee will focus on the technical content of the program and will have the authority to co-opt additional temporary members when particular technical expertise is needed.



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3. Members will be appointed jointly by the Assistant Deputy Ministers (ADMs) of GSC and GSNL on the recommendations of the Geoscience Programs Committee.
  4. The chairman of the Joint Technical Advisory Committee will be appointed by the ADMs.
  5. At least two representatives of GSC and two representatives of GSNL shall attend meetings of the Joint Technical Advisory Committee to provide information about the entire program of each survey, and secretarial and executive services to the committee. At least one of the representatives from each of GSC and GSNL shall be a member of the Geoscience Programs Committee.

### **Terms of Reference**

1. The Joint Technical Advisory Committee will comment and advise on:
  - the needs study conducted by GSC and GSNL to address the geoscience needs in Newfoundland and Labrador,
  - the annual priorities and operational plans of GSNL and of the activities of GSC in Newfoundland and Labrador,
  - progress of each organization in achieving annual goals for their activities in Newfoundland and Labrador, and
  - opportunities for, and effectiveness of, coordination.

### **Meeting Schedule and Funding**

1. The Joint Technical Advisory Committee will meet at least once per year. The venue of each meeting will be established by GSNL in consultation with GSC.
2. Costs of operating the Committee will be shared equally by GSC and GSNL. Committee members will serve without remuneration, but will be reimbursed for travel and living expenses associated with Committee activities.
3. Provision of secretarial support to the Joint Technical Advisory Committee, including taking of minutes at meetings and support to the Committee Chairman in developing and distributing Committee reports, will be equally shared between GSC and GSNL.

### **Reports**

1. Following each meeting, the Joint Technical Advisory Committee will provide a written report to the Geoscience Programs Committee on the points noted in its Terms of Reference. Following any necessary clarification, a final report will be submitted to the ADMs.
2. The Joint Technical Advisory Committee will prepare a brief annual summary report for the Minister of Natural Resources Canada and the Minister of Mines and Energy for Newfoundland. This report will comment on progress in addressing the geoscience needs of Newfoundland, as defined in the five-year needs study and annual work plans, and on the effectiveness of cooperation between GSC and GSNL.



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This Memorandum of Agreement does not create legally binding obligations between the parties but expresses their desire to cooperate and coordinate geoscience activities.

Handwritten signature of Jean C. McCloskey in black ink.

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Jean C. McCloskey  
Deputy Minister  
Natural Resources (Canada)

Handwritten signature of Fred G. Way in black ink.

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Fred G. Way  
Deputy Minister  
Department of Mines and Energy  
Government of Newfoundland and Labrador

Handwritten signature of Andrew F. Noseworthy in black ink.

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Andrew F. Noseworthy  
Deputy Minister of Intergovernmental Affairs  
Government of Newfoundland and Labrador

*Aussi disponible en français*

**APPENDIX C**

**WORKSHOP PLANNING COMMITTEE  
AND FACILITATORS**





# GEOSCIENCE NEEDS WORKSHOP

## FACILITATORS

1. John Fleming
2. Martin Batterson
3. Lawson Dickson
4. Don James
5. Andy Kerr
6. Gerry Kilfoil
7. Dave Liverman
8. Norm Mercer
9. Sean O'Brien
10. Cyril O'Driscoll
11. Chris Pereira
12. Bruce Ryan
13. Greg Stapleton

## ORGANIZING COMMITTEE

1. Frank Blackwood
2. Steve Colman-Sadd
3. Peter Davenport
4. Baxter Kean
5. Andy Kerr
6. Norm Mercer
7. Sean O'Brien
8. Jerry Ricketts
9. Dick Wardle

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Vancouver, BC (C.-B.) V6B 5J3 Canada**



**APPENDIX D**

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# GEOSCIENCE NEEDS WORKSHOP

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**APPENDIX E**  
**LIST OF WORKSHOP PARTICIPANTS**



# GEOSCIENCE NEEDS WORKSHOP

Delta St. John's

November 1 – 3, 1998

## List of Participants

### *Client Participants\**

- |  |   |
|--|---|
| 1. BLAKE, Mark<br>Iron Ore Company of Canada                         | 12. GUZZWELL, Keith<br>Department of Environment & Labour |
| 2. BREWER, Kevin<br>Consultant                                       | 13. HALL, Jeremy<br>Department of Earth Sciences, MUN     |
| 3. BRUCE, Scott<br>Falconbridge Limited                              | 14. HARRIS, Alex<br>Burin Minerals Ltd.                   |
| 4. CALON, Tom J.<br>Department of Earth Sciences, MUN                | 15. KATAY, John<br>Petro Canada                           |
| 5. CHAN, Lai Lai<br>Prospector                                       | 16. KING, Arthur<br>Department of Earth Sciences, MUN     |
| 6. DALTON, Brian<br>Altius Minerals Corp.                            | 17. KIRBY, Garry<br>Geo-Matics Services                   |
| 7. DIMMELL, Peter<br>Maple Mark International Inc.                   | 18. KIRBY, Jerry<br>Mount Pearl Senior High School        |
| 8. DUNNING, Greg<br>Department of Earth Sciences, MUN                | 19. LANE, Tom<br>Teck Exploration Ltd.                    |
| 9. ENGLISH, Joe<br>Department of Works, Services &<br>Transportation | 20. LARACY, Patrick<br>Vulcan Minerals                    |
| 10. FRENCH, Vic<br>V.A. French Geol. Consult. Inc.                   | 21. MARTIN, Cabot<br>Resource Consultant                  |
| 11. GREENE, Bryan<br>Consultant                                      | 22. MAUNDER, John E.<br>Nfld. Museum                      |

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\* Written communications were received from Laura Jackson, Protected Areas Association of Newfoundland and Labrador, and Mark Cooper, PanCanadian Petroleum Ltd.

- |   |   |
|---|---|
| 23. MERCER, Roderick<br>Pennecon Ltd.                               | 32. SCOTT, Susan<br>GeoScott Exploration Consultants    |
| 24. MEYER, Jamie<br>Meyer Industrial Mineral Consultants            | 33. SCOTT, W.J.<br>GeoScott Exploration Consultants     |
| 25. MILLAN, Steven M.<br>Imperial Venture Corp.                     | 34. TUACH, John<br>Buchans River Ltd.                   |
| 26. NOEL, Nath<br>Consultant  | 35. TURPIN, Alex<br>Independent Prospector              |
| 27. PARDY, Jason<br>Tamarack Geographic                             | 36. WALSH, Denis<br>Prospector                          |
| 28. POWER, Glenn<br>Canada-Newfoundland<br>Offshore Petroleum Board | 37. WILLIAMS, Hank<br>Department of Earth Sciences, MUN |
| 29. RIVERS, Toby<br>Department of Earth Sciences, MUN               | 38. WILTON, Derek<br>Department of Earth Sciences, MUN  |
| 30. ROLLINGS, Ken<br>Department of Environment & Labour             | 39. WOODWORTH-LYNAS, Chris<br>Petra International       |
| 31. SCHILLEREFF, Scott<br>Jacques Whitford Environment Ltd.         |   |

## *Resource Personnel*

### **Geological Survey of Newfoundland and Labrador**

- |                       |                    |
|-----------------------|--------------------|
| 1. BATTERSON, Martin  | 7. EVANS, Dave     |
| 2. BLACKWOOD, Frank   | 8. FINCH, Chris    |
| 3. BOYCE, Doug        | 9. GOWER, Charlie  |
| 4. COLMAN-SADD, Steve | 10. HOWSE, Ambrose |
| 5. DAVENPORT, Peter   | 11. JAMES, Don     |
| 6. DICKSON, Lawson    | 12. KEAN, Baxter   |



- |                     |                     |
|---------------------|---------------------|
| 13. KERR, Andy      | 21. PEREIRA, Chris  |
| 14. KILFOIL, Gerry  | 22. RICKETTS, Jerry |
| 15. KNIGHT, Ian     | 23. RYAN, Bruce     |
| 16. LIVERMAN, Dave  | 24. SMITH, Jan      |
| 17. McCONNELL, John | 25. STAPLETON, Greg |
| 18. NOLAN, Larry    | 26. TAYLOR, Dave    |
| 19. O'BRIEN, Brian  | 27. WARDLE, Dick    |
| 20. O'BRIEN, Sean   |                     |

### Geological Survey of Canada

- |                       |                    |
|-----------------------|--------------------|
| 1. ACHAB, Aïcha       | 9. GRIEVE, Richard |
| 2. BÉDARD, Jean       | 10. JONASSON, Ian  |
| 3. BOURGEOIS, Annette | 11. KING, Janet    |
| 4. CHERRY, Mike       | 12. LEBEL, Daniel  |
| 5. DILABIO, Ron       | 13. McALPINE, Don  |
| 6. DUBÉ, Benôit       | 14. SHAW, John     |
| 7. DUKE, Murray       | 15. TOD, Joan      |
| 8. FADER, Gordon      | 16. VERHOEF, Jacob |



**APPENDIX F**  
**WORKSHOP AGENDA**



# GEOSCIENCE NEEDS WORKSHOP

Delta St. John's  
November 1 – 3, 1998

## PRELIMINARY AGENDA

Chief Facilitator: John Fleming, Resource Concepts

### SUNDAY (November 1)

7:00–9:00 P.M. REGISTRATION AND RECEPTION  
– Crush Lobby

### MONDAY (November 2)

8:00 a.m. Registration

8:20 Plenary Assembly

8:30 Welcome and Introduction..... Frank Blackwood  
Director, Geological Survey of  
Newfoundland and Labrador (GSNL)

Murray Duke  
Director General, Minerals and  
Regional Geosciences Branch,  
Geological Survey of Canada (GSC)

8:50 OVERVIEWS

Bedrock Geology..... Stephen Colman-Sadd  
Senior Geologist, GSNL

Geochemistry, Geophysics  
and Terrain Sciences..... Peter Davenport  
Senior Geochemist, GSNL

Mineral Deposits..... Richard Wardle  
Senior Geologist, GSNL

Marine Geoscience..... Jacob Verhoef  
Director, GSC Atlantic

Geoscience Information..... Baxter Kean  
Senior Geologist, GSNL

10:30 BREAK

10:50 Breakout Sessions Introduction  
and Instruction..... John Fleming

11:00 "Strategic Directions – The Client's Perspective" – Breakout Sessions

12:30 LUNCH

1:30 "Strategic Directions" Breakout Sessions (CONTINUED)

3:00 BREAK

3:30 Plenary – Facilitators Reports

4:30 General Discussion

5:00 End of Day 1 Formalities

**Note:** A reception and cash bar begins at approximately 5:00 p.m.

## **TUESDAY (November 3)**

8:20 a.m. Plenary Assembly

8:30 Day 1 Summary and General Discussion

8:50 Breakout Sessions introduction  
and instruction..... John Fleming

9:00 "Specific Client Needs – Establishing your priorities for the next 5-10 years" –  
Breakout Sessions

10:30 BREAK

- 11:00 "Specific Client Needs" Breakout Sessions (CONTINUED)
- 12:30 LUNCH
- 1:50 Plenary Assembly
- 2:00 Facilitators reports
- 3:00 General Discussion
- 3:30 Chief Facilitator's Concluding  
Remarks..... John Fleming
- 4:00 End of Workshop





**APPENDIX G**

**QUESTIONNAIRE RESPONSE SUMMARY**





## NEEDS STUDY QUESTIONNAIRE: THE RESPONSE

The Geological Survey of Newfoundland and Labrador, in conjunction with the Geological Survey of Canada, hosted a two-day Geoscience Needs Study (November 1 and 2, 1998) to define the types of geoscience information the province will require in the future. This questionnaire was made available to those at the workshop and to those unable to attend.

All respondents were asked to complete Part I of the questionnaire; only the relevant portions of Part II were to be completed.

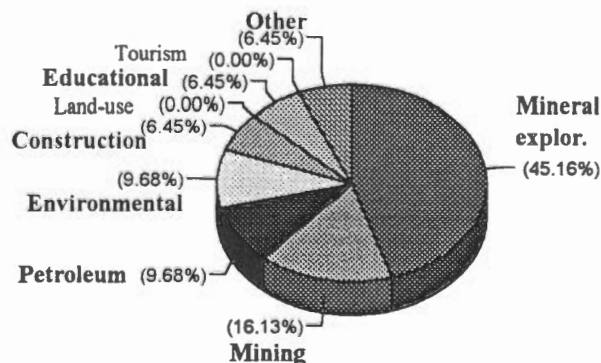
### PART I - GENERAL

Total number of responses = 31

#### Question 1. Respondent's principal activity(ies)

	%		
Mineral Exploration	45	Construction Industry, road builders and geotechnical services	6
Mineral Development and Mining	16	Land-use Planning	0
Petroleum and Natural Gas Industries	10	Educational institutions	6
Environmental geoscience and hydrology	10	Tourism	0
		Other	6

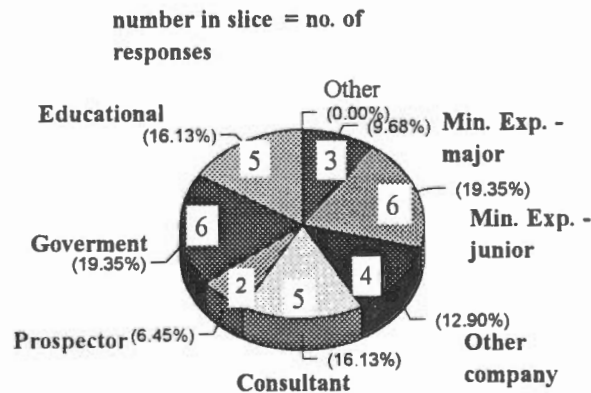
#### Activity Profile



**Question 2. Respondent's Employment:**

	%	Prospector	6
Mineral exploration company - major	10	Government Agency	19
Mineral exploration company - junior	19	Educational Organization	16
Other private company	13	Other	0
Consultant	16		

**Employment Profile**



**Question 3. How frequently do you use Geological Survey products:**

Frequent users (more than once per month)	65%
Infrequent users (less than once per month)	35%

**Question 4. On a scale of 1 to 5 indicate how useful you find each of the main activities of the geological surveys of Newfoundland and Labrador, and Canada.**

The response was divided into subgroups and analysed in terms of mode; 1= very useful; 2 =moderately useful; 3 = useful; 4 = less useful; 5 = not useful). 0 indicates insufficient data to provide a mode.

**4a MINERALS SUBGROUP (Mineral Exploration and Mining Development)**

No of Responses = 19 (61% of total)

Bedrock mapping	1
Surficial mapping	3
Geochemical surveys	2
Geophysical surveys	2
Mineral deposit studies	1
Industrial mineral and aggregate studies	3
Environmental geoscience and geohazard studies	5
Marine geoscience	5
Geoscience information	1
Promotion and public awareness	3

#### **4b PETROLEUM SUBGROUP**

No of responses = 3 (10% of total). There was insufficient data from this group (2 complete; 1 incomplete responses) to provide modal data

#### **4c OTHERS SUBGROUP (Environmental, Construction, Educational and Other)**

No of responses = 9 (29% of total)

Bedrock mapping	1
Surficial mapping	1
Geochemical surveys	3
Geophysical surveys	0
Mineral deposit studies	0
Industrial mineral and aggregate studies	0
Environmental geoscience and geohazard studies	0
Marine geoscience	3
Geoscience information	2
Promotion and public awareness	0

***Interpretation note:*** In the following verbal replies, responses are divided by activity according to question 1.0.

### **Question 5. Any general comments on Geological Survey of Newfoundland and Labrador activities?**

Mineral Exploration group

- There should be more in-depth work done in southeastern Labrador. There is just not enough geological information on this area.
- Consistently deserve very high rating.
- Work done during my 24-year absence has been tremendous. I have kept apace of the work of GSNL through contact with GSNL staff and reading through the Report of Activities and Current Research.

- Continuation of public awareness and public education – This is essential in the maintenance of the teaching of the earth sciences at a high school level. If this is not done on a concerted level then the present policy of the elimination of these areas at the high school level will continue and will eventually be lost entirely. If this happens, then students will no longer be exposed and encouraged to pursue a career in the earth sciences and as with most of us I suspect any student in future who pursues this field of study will do so more by accident than by design. In a country such as Canada and a province such as ours, I personally feel that this would be a great loss of potential. We should not have to import earth science expertise - either into the country or the province - we need to concentrate on developing our own.
- Services provided are generally very good. I would prefer to have GSNL focus its resources on collection, and rapid and accessible dissemination of data (digital and hard copy). Leave more esoteric work (compilations, deposit studies, regional correlations, etc.) to the GSC - more resources.
- More emphasis should be placed on field work to continue upgrading the geological mapping. Problem areas could be identified by consulting with industry.
- The Geological Survey has an excellent record of geological mapping and mineralization studies. It is a leader in digital presentation of data, especially geochemistry. The information section (Norm Mercer et al.) is very helpful to industry and promotes mining in the province.
- Access to GSNL staff is excellent, and much more useful than is the case in other provinces. GSNL should be working in petroleum (west coast, on-offshore, Grand Banks)

#### Mineral Development and Mining

- Need to make Geofiles available by internet in more legible format than current microfiche reader. Need to distinguish between “Geofacts” - actual observations and “Geofantasy” - interpretation.
- Overall quality/cooperation excellent. Unknown on willingness to change but this session may be a major stepping stone. On stone ..... let's not forget dimension stone.
- Focus should be kept on the basics, i.e., bedrock mapping. Keep the information from field work available for all and easily accessible.

#### Petroleum and Natural Gas Industry group

- Selected studies are sometimes very useful.
- Should be at the highest level possible in view of the growth of the natural resource sector. Industry needs the support of projects completed by the Survey. Management of provincial resources cannot be prudent, proper or efficient without an effective Survey.
- Humber Zone basic field mapping has been of immense value to us. Detailed reassessment of stratigraphic sections and paleontological dating also of great value.
- Excellent program as a balance between production of consistent systematic geoscience information and regional interpretation.
- Generally well-balanced program, Mineral Deposit studies, follow-up geochem and geophysics should be left to the private sector.

#### Other Activities group

- Good balance and range of activities. Publications of a high standard.

## **Question 6. Any general comments on Geological Survey of Canada activities?**

### **Mineral Exploration group**

- Also deserve very high rating.
- Continuation of public awareness and public education – This is essential in the maintenance of the teaching of the earth sciences at a high school level. If this is not done on a concerted level then the present policy of the elimination of these areas at the high school level will continue and will eventually be lost entirely. If this happens, then students will no longer be exposed and encouraged to pursue a career in the earth sciences and as with most of us I suspect any student in future who pursues this field of study will do so more by accident than by design. In a country such as Canada and a province such as ours, I personally feel that this would be a great loss of potential. We should not have to import earth science expertise - either into the country or the province - we need to concentrate on developing our own.
- Should be doing more basic research, more emphasis on technology.
- Services provided are generally very good. I would prefer to have GSNL focus its resources on collection, and rapid and accessible dissemination of data (digital and hard copy). Leave more esoteric work (compilations, deposit studies, regional correlations, etc.) to the GSC - more resources.
- Some studies in the past were excellent - Labrador mapping and deposit studies by Benoit Dube. Analytical facilities are useful. In past, some studies were too independent and not useful.
- Access is difficult because there is nobody here in NF. Responsibility in the GSC for offshore petroleum is scattered among Dartmouth, Alberta and Quebec, so it is difficult even to find out where to go.

### **Mineral Development and Mining group**

- Almost entirely in “Geofantasy” area.
- Need to increase visibility and awareness. Feds should reconsider MDA’s.

### **Petroleum and Natural Gas Industry group**

- Selected studies are sometimes very useful.
- Same as for Newfoundland Survey. The regional assessment studies of the GSC are absolutely invaluable and many of the products are the best examples available in the World! Incalculatable value accrues from the East Coast work for example.
- In the Humber Zone too much emphasis on undertaking work for publication.

### **Educational Institution group**

- Excellent scientists producing good regional interpretations, but could do better offshore in provision of accessible systematic geoscience information (especially maps).
- Restrict to regional (1:100 000 scale or less) mapping. Do not use PDF’s to carry out major mapping programs. More detailed regional geophysical surveys should be an essential component of GSC contribution in future.

### **Other activities**

- Publications at a high standard.

## PART II - SPECIFIC ACTIVITIES

The following sections asked for comments on the main activities of the *Geological Survey of Newfoundland and Labrador* and the *Geological Survey of Canada* in the province. **ONLY THOSE SECTIONS IMPORTANT TO THE RESPONDENT WERE TO BE COMPLETED.** Modal responses are indicated in the tables below. Multiple modes of equal value are indicated by more than one figure separated by a comma. O= insufficient data for modal analysis.

**Column 1 - IMPORTANCE.** 1 = very useful; 2 = moderately useful; 3 = useful; 4 = less useful; 5 = not useful)

**Column 2 - QUALITY.** 1 = excellent; 2 = good; 3 = fair or average; 4 = poor; 5 = very poor

**Column 3 - PROVIDER.** N = Geological Survey of Newfoundland and Labrador; C = Geological Survey of Canada, B = both agencies.

### 5. BEDROCK MAPPING: No of responses = 23

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
1:50 000 to 1:100 000 scale maps	1	2	N
Maps more detailed than 1:50 000 scale	1	1	N
Compilation maps (less detailed than 1:250 000 scale)	1	2	N
Paleontology	5	2	C,B
Geochronology	3	2	C

**Question 5a. What is the most useful scale for bedrock mapping to you.**

90% favoured 1:50 000 scale. The remainder requested more detailed scales.

**Question 5b. Any comments on the level of bedrock mapping activities? Are there additional activities or resources that should be provided?**

Mineral Exploration group

- 1:50 000 maps that I have used are accurate from what I can make out.
- Incomplete at 1:50 000 scale. More digital products. Increase level of funding and therefore staffing.
- New maps generate new/more interest in the areas.
- Older maps, particularly for central Newfoundland need to be redone. Some of new maps too thematic, i.e., contains (confuses?) basic information .... (unreadable word). Need more detailed maps in very high potential areas.
- Integrate with geophysical, geochemical database.
- Fundamental role of Mines Branch – should be more done, at the expense of more esoteric activities.
- Many areas previously mapped need to be revisited as a result of new ideas and information. Some complex areas need to be mapped at a more detailed scale, maybe 1:20 000.



- Reference to all mineral occurrences; outcrop location; alteration; structural strength.
- 1:50 k should be completed for the island. 1:100k for Labrador.

#### Mineral Development and Mining group

- All maps should show observation locations distinct from interpretations.
- Have sharply reduced programs over past 5 years and this is of major concern.

#### Petroleum and Natural Gas Industry group

- Not familiar with present level but if anything is important this is, should not be decreased, should include increased awareness of industry deliverables.
- Level is excellent - should be continued, look at joint ventures with industry.

#### Environmental geoscience and hydrology group

- Bedrock and surficial mapping are the two most important mapping information that we make use of.

#### Educational institution group

- Virtually nothing done offshore except at 1:2M scale – inadequate for my purposes – regional synthesis of Appalachian structure and of Mesozoic/Tertiary basins.
- Quality of bedrock mapping program would be greatly enhanced by acquisition and use of detailed (e.g., 400 m spacing) aeromagnetic maps. This would result in: 1) improved interpretation, 2) greater use by exploration community, 3) improved ability to interpret geology in third dimension.

#### Other activities group

- Level: Good. Preliminary copies should be published within a year of completing mapping projects.

### **Question 5c. What/where should be the specific targets for future bedrock mapping?**

#### Mineral Exploration group

- Southeastern Labrador
- NTS 13A; 14C; 14E; 13N; 12A; 12H; 3D
- Continue systematic approach, balanced between Newfoundland and Labrador.
- Buchans, Duck Pond, Central Newfoundland. Most important to finish regional map program in Newfoundland.
- Areas now poorly mapped; “poorly” meaning note @ 1:50 000; outdated mapping.
- Central Newfoundland Buchans - Victoria Lake; Avalon Zone - Burin. Many sheets were done more than 10 years ago, may require check mapping especially in light of new discoveries, activity. – Focus on new information/exposures/drill core, talk to company personnel – Not re-map, just update.
- Areas where active mineral exploration is ongoing and areas such as the Avalon where new information may encourage more exploration activity.
- Mineral belts: central Newfoundland, Burin and Avalon peninsula; Labrador mineral occurrences.

- West coast of island, e.g. sediments for petroleum prospects

Mineral Development and Mining group

- Areas not yet covered.
- Buchan's Robert's Arm. Mapping of "unique" dimension stones. Avalon zone - Au.

Petroleum and Natural Gas Industry group

- Petroleum - West Coast - detail. The structural story is far from understood and reflects significantly on the West Coast activity.
- Complete mapping of the Humber Zone Autochthon and the revise mapping of Taconic Allochthons.

Environmental geoscience and hydrology group

- Where voids exist.

Construction Industry, road builders and geotechnical service group

- The west coast of the Island and Bonavista Peninsula.

Educational institution group

- Offshore.
- Both Newfoundland and Labrador. Both prospective and 'non prospective' areas. If funds are restricted, better to do less high quality mapping (with aeromag backup) than more without it.

Other activities group

- Avalon Zone of Newfoundland. Areas with numerous mineral/economic prospects but lacking in 1:50 000 coverage.

**6. SURFICIAL MAPPING: No of responses = 22**

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
1:50 000 scale or more detailed maps	1	2	N
Regional maps (>1:250 000 scale)	3	2	N
Ice flow mapping	1	2	N
Paleoenvironmental studies	5	2	N,C,B

**Question 6a. What is the most useful scale for surficial mapping to you.**

73% favoured 1:50 000 scale mapping. The remainder favoured more detailed scales

**Question 6b. Any comments on the level of surficial mapping activities? Are there additional services or resources that should be provided?**

Mineral Exploration group

- Surficial mapping to aid geochemical interpretation is important.

- When one suddenly needs the information (i.e., a client) it's great/critical to have.
- Overdone. Not a priority.
- Province is adequately covered now, deal with map specific areas on an as-needed basis.
- Bedrock mapping more relevant - check with publications section - How many of these maps are regularly ordered? vs geology?
- Relationships of terrain to geochemical anomalies and mineralized float.

#### Mineral Development and Mining group

- Not enough.

#### Petroleum and Natural Gas Industry group

- Not my area of specialty.

#### Environmental geoscience and hydrology group

- A systematic plan is required. More integration of paleoenvironmental research is required. More interaction between both surveys and university especially for detailed research. Currently the provincial survey is the only one active.

#### Other activities group

- Level: Good. Dates when available (absolute palynology, etc.).

### **Question 6c. What/where should be the specific targets for future surficial mapping?**

#### Mineral Exploration group

- Labrador
- None
- Key mineral belts: central Newfoundland; Labrador occurrences.
- Dunnage zone

#### Mineral Development and Mining group

- Central Newfoundland - Buchan's belt, Baie Verte.

#### Petroleum and Natural Gas Industry group

- Cannot advise but the geochemical work of Davenport and others should serve as complementary.

#### Environmental geoscience and hydrology group

- We have mapped the eastern part of the island including Clarenville-Terra Nova and will map Burin at 1:50 000 or finer. The transmission line and Trans-Labrador Highway extension will be mapped by someone very shortly - what quality will result? Integration with coastal zone mapping is vital; much as been done but many investigators are unaware of diverse efforts. We are now in a position to assemble mapped data, ice-flow data, etc. across the island.

#### Other activities group

- Ecological sensitive areas; residential and commercial areas with high population density.

**7. GEOCHEMICAL SURVEYS: No of responses = 17**

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
Regional lake and stream sediment	1	1	N
Follow-up lake and stream sediment	1	1	N
Detailed soil and till surveys	1	1	N
Regional lithogeochemical surveys	1	3	N
Detailed lithogeochemical studies	1	1,3	N
Method Development	1,2,3,4	2	C

**Question 7a. Any comments on the level of geochemical activities? Are there additional services or resources that should be provided?**

Mineral Exploration group

- More access to the methodology as far as data manipulation (e.g., more access and description???)
- Detailed follow-up should be left to industry.
- Province is covered on regional basis – deal with specific areas on an “as needed” basis.
- Regional surveys very useful to highlight particular elements or environments. Follow up surveys should be restricted to remote areas or specialized targets - otherwise let industry do it.
- Regional lake and till surveys are very useful detailed surveys. Should be left for private companies. More lithogeochemical surveys to help identify groups, formations and alteration signatures would be useful.
- Region covered by surveys.

Mineral Development and Mining group

- Verify anomalous data before publication.
- Sufficient.

Petroleum and Natural Gas Industry group

- Programme has been a world leader. Suberb results with excellent potential for future industry development.

Educational institution group

- Surveys should be regional in scope. Detailed follow-up should be left to private sector if funds are tight.

Other activities group

- Level: very good.

**Question 7b. What/where should be the specific targets for future geochemical surveys?**

Mineral Exploration group

- Southeastern Labrador follow-up.
- 13A; 3D
- Areas of active exploration and any other area where more activity can be encouraged.
- Follow up and interpretation in mineralized regions.

Mineral Development and Mining group

- Areas not yet surveyed.
- Focus targets in areas of major prospecting/exploration activity.

Petroleum and Natural Gas Industry group

- Already leading the way. Continue to improve data levels, interpretative capabilities and industry training and marketing.

Educational institution group

- Improvements in regional coverage.

**8. GEOPHYSICAL SURVEYS: No of responses = 19**

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
Regional aeromagnetic surveys	1	2,3	C
Regional airborne EM surveys	1	2	C
Regional gravity surveys	1	2	C
Regional radiometric surveys	3	2,3	C
Detailed ground surveys	5	3	B,C
Method Development	1,2,5	2	C

**Question 8a. Any comments on the level of geophysical activities? Are there additional services or resources that should be provided?**

Mineral Exploration group

- More regional EM surveys are required, compilation of filed assessment airborne geophysics (mag and AEM). More basic research to lower cost of discovery.
- Detailed work should be left to industry. Compilations of industry results OK by Newfoundland.
- Existing database seems adequate – consideration may be given to new gradient magnetic and EM techniques which would add value to existing database.
- Regional surveys very useful to highlight particular elements or environments. Follow up surveys should be restricted to remote areas or specialized targets - otherwise let industry do it.

- Research to improve known surveys and develop new models would be useful. Detailed surveys should be left to private enterprise.
- Contract surveys in areas of interest.
- Compilation/interpretation of regional surveys with correlations among the methods

#### Mineral Development and Mining group

- Hi-elevation map surveys give poor detail.
- Should be increased in partnerships with major exploration companies.
- Provide R & D on metals for use in mining industry, i.e., down-the-hole-probe for in-situ grade determination.

#### Petroleum and Natural Gas Industry group

- Increase level is absolutely necessary to complement industry activity and help drive exploration forward.
- Detailed surveys should be left to industry and method development should be done by universities.

#### Educational institution group

- Redo aeromag at 400 m spacing in areas to be mapped – also EM surveys (can these be done at the same time?).

#### Other activities group

- Level: Fair/Good. Update old surveys.

### **Question 8b. What/where should be the specific targets for future geophysical surveys?**

#### Mineral Exploration group

- Southeastern Labrador, NTS 3D/5W; 13A/1, 8 & 9; 13H/1 & 8; 3E/4 & 5; aeromagnetic; EM and gravity.
- Labrador as a whole. Need to integrate digital topo data with geochemical surveys and radiometric surveys.
- Central Newfoundland
- Mineral belts and unexplored sedimentary basins for minerals onshore.
- Mineral belts: central Newfoundland. Radiometric: Burin, Avalon Peninsula.
- Increased density in Labrador gravity coverage. Deep-penetration regional EM in Labrador, especially in north, before parkland set aside.

#### Mineral Development and Mining group

- Low-elevation mag and gradiometer surveys in areas having mineral resource potential.
- Co-specific, belts to be negotiated.
- Western Labrador. Current surveys are 20-30 years old. Any improvements in technique which may benefit the operating mines?

#### Petroleum and Natural Gas Industry group

- Address areas highlighted by geochemical work.
- Humber Zone and Gulf of St. Lawrence.

Educational institution group

- Areas undergoing bedrock mapping.

## 9. MINERAL DEPOSIT STUDIES: No of responses = 16

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
Individual deposit studies	1	2	B
Mineral-belt studies	1	2	B
Regional metallogeny	1	2	N,B
Deposit-type studies	1	1,3	B
Mineral Occurrence Data Inventory	1	2,3	N

### Question 9a. Any comments on the level of mineral deposit activities? Are there additional services or resources that should be provided?

Mineral Exploration group

- All information I have seen on mineral deposit studies for southeastern Labrador have been severely devoid of information and was for the most part compiled from data received over 25 years ago. Further work should be done in area, and more detailed data made available.
- MODS should be updated more frequently and tied to the claims map databases.
- More effort is required. Increased level of funding and therefore staffing.
- Overdone. Also in many cases best cover as thesis work by students. MODS may need to be re-evaluated in ... (unreadable word) of "Qualified Person" to verify original data - i.e., Toronto Ontario Security commission requirements.
- If mineral deposit studies are carried out they should go well beyond describing existing showings – they should provide models for exploration.
- New or emerging areas of high exploration interest should be regularly re-evaluated for status of current knowledge. MODS cards for 'HOT' areas should be updated urgently as required.
- More litho-geochemical on known deposits and mineral belts to provide a database for industry.
- Limited work beyond descriptions of Evans and Wilton; need to know individual deposits to make sense of regional metallogeny.

Mineral Development and Mining group

- Need to expand these areas.

Petroleum and Natural Gas Industry group

- A critical base for Provincial resource development.

Educational institution group

- Concentrate on regional character of deposits. Detailed studies of individual deposits should be left to the private sector if funds are tight.

Other activities group

- Level: Good.

**Question 9b. What/where should be the specific targets for future mineral-deposit work?**

Mineral Exploration group

- Southeastern Labrador
- 1:50 000 mapping of specific geological terrains. GRUB or Buchans/Roberts Arm.
- Central Newfoundland - Buchans - Victoria Lake groups; Grand Falls - Gold.
- Central Newfoundland; Labrador.

Mineral Development and Mining group

- Concentrate activities in prospective areas which are open for staking.
- Buchans Robert's Arm; Baie Verte; Burin - Avalon.

Petroleum and Natural Gas Industry group

- Cannot advise.

Educational institution group

- Generic and regional aspects of mineral deposits.

**10. INDUSTRIAL MINERAL AND AGGREGATE STUDIES: No of responses = 11**

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
Reconnaissance industrial-mineral surveys	1	1	N
Reconnaissance aggregate surveys	1	1	N
Detailed industrial mineral deposit evaluation	1	1	N

**Question 10a. Any comments on the level of industrial mineral/aggregate activities? Are there additional services or resources that should be provided?**

Mineral Exploration group

- Keep carrying out aggregate studies, critical for the construction industry.
- Industrial mineral surveys are considered more important than aggregate surveys – it appears province is adequately covered for aggregate surveys – future surveys should only be conducted on an “as needed” basis.

Mineral Development and Mining group

- Industrial minerals – preliminary market studies should precede reconnaissance surveys.
- Not enough work being done in this area. Replacement for Jamie Meyer needed.

Petroleum and Natural Gas Industry group

- There are significant potential opportunities for future industry. These need to be promoted.



Construction Industry, road builders and geotechnical service activities

- More petrographic analysis to be available.

Educational institution group

- Make sure that aggregate surveys reach end-users.

Other activities group

- Industrial mineral activities of more relevance to us than aggregate studies.

**Question 10b. What/where should be the specific targets for future industrial mineral or aggregate work?**

Mineral Exploration group

- Market research.
- Aggregates - Northern Peninsula, offshore

Mineral Development and Mining group

- Where market studies indicate development of resources may be feasible.
- Focus on identifying potentially “unique” stones.

Petroleum and Natural Gas Industry group

- Cannot advise.

Construction Industry, road builders and geotechnical service activities

- Aggregate work – Trans Labrador Highway as the road is being pushed through and after.

**11. MARINE AND COASTAL ZONE GEOSCIENCE: No of responses = 13**

ACTIVITY	1- IMPORTANCE	2 - QUALITY	3 - PROVIDER
Marine geophysics	1,2,3	2	C
Placer mineral potential	2	1,4	B
Seafloor mapping	1	4	C,B
Offshore petroleum	1	2	B
Surficial geology	1,2,3	3,4	B

**Question 11a. Any comments on the level of marine and coastal zone geoscience activities? Are there additional services or resources that should be provided?**

Mineral Exploration group

- Should be based in Newfoundland – not Halifax.
- Petroleum geoscience services are not provided within the provincial survey but should be.
- Marine is at serious risk. It is extremely important for the future of east coast oil to maintain a significant program.

#### Mineral Development and Mining group

- Increase petroleum related expertise in GSNL.

#### Petroleum and Natural Gas Industry group

- Increase necessary for support of physical and natural resource development – Critical!
- Onshore geology needs to be extended into offshore area to aid hydrocarbon exploration.

#### Environmental geoscience and hydrology group

- Shore zone is important to us.
- Collaboration for coastal zone management between AGC, NF survey and MUN is essential. Coastal zone management-related activities must increase; increased interest in working with NF fisheries and aquaculture. Continue to promote links with DFO. Collaborate with CHART.

#### Educational institution group

- Access to the geoscience information here is quite inadequate and is the first priority for future endeavor, i.e., don't collect more data: translate what you have into maps.
- The importance to the province of these activities is significant. They are almost exclusively done without provincial involvement. A better partnership in the program delivery would be highly desirable.

#### Other activities group

- Level: Fair. Would like to see more effort on nearshore bedrock geology.

### **Question 11b. What/where should be the specific targets for future marine and coastal zone geoscience work?**

#### Mineral Exploration group

- West coast offshore Newfoundland for marine geophysics and petroleum. NE coast (White Bay to Cape Freels) for placer.

#### Mineral Development and Mining group

- Areas where work is most likely to result in new economic activity.
- Western Newfoundland petroleum targets.

#### Petroleum and Natural Gas Industry group

- Requires discussion because of broad scope.
- Offshore petroleum SHOULD NOT be a target. This is best done by the oil companies.

#### Environmental geoscience and hydrology group

- Will endeavor to study onshore-offshore correlation Burin-Avalon-Grand Banks-Placentia Bay-Fortune Bay. Target high-pressure coastlines - Stephenville, Port-aux-Port, Placentia Bay, Trinity Bay. Target estuaries/embayments - Humber Arm, Botwood, Bay of Exploits, Melville, etc.

#### Educational institution group

- Produce consistent, systematic maps of offshore.

- Placer exploration will/would be an environmental disaster incompatible with a productive fishery. (Activity ) #2 should be abandoned.

Other activities group

- Eastern coastal Newfoundland.

**12. ENVIRONMENTAL GEOSCIENCE AND GEOHAZARD STUDIES: No of responses = 12**

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
Coastal-erosion studies	2	2,3	N
Avalanche and landslide risk	2	2	N
Site-specific environmental studies	1	0	N

**Question 12a. Any comments on the level of environmental geoscience and geohazard activities? Are there additional services or resources that should be provided?**

Mineral Exploration group

- Leave to private industry.
- Site-specific environmental studies are well-handled in the private sector, GSNL and GSC should not use precious resources in this work.

Mineral Development and Mining group

- Studies of factors affecting health.
- Do not overlap with private sector, but integrate needs of environmental geoscience in data collection. This does not need to add costs.

Petroleum and Natural Gas Industry group

- Others can comment better – however in one instance of St. George Bay my Ph.D. students have contributed.

Environmental geoscience and hydrology group

- We are into flood risk mapping. Any erosive studies or the like would be useful to us.
- Linkage of coastal to previous discussion. Most is probably better handled locally. Requires look at EIA legislation and practices. Level of activity should increase.

Educational institution group

- Generalized risk assessment.

Other activities group

- Level: Modest.

**Question 12b. What/where should be the specific targets for future environmental and geohazard work?**

Mineral Development and Mining group

- Populated areas.
- Not sure.

Petroleum and Natural Gas Industry group

- Others more qualified to comment specifics.

Environmental geoscience and hydrology group

- Tourism management and resource management especially in coastal zones – aquaculture, golf courses, use of beaches. More linkage with geochemistry, estuarine/ embayment studies, preservation/conservation, discussion with provincial and federal parks/environment. Direct involvement in EIA issues.

Other activities group

- This is one area that information should be passed on to the general public, certainly if there is an avalanche or landslide risk!

**13. GEOSCIENCE INFORMATION: No of responses = 24**

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
Hard-copy publications	1	1	B
Digital publications	1	2	B
Catalogues and bibliographies	1	2	B
Internet services (including web site)	1	2	N,B
Geofile services	1	2	N
Client consultations	1	2	N
Conference Presentations	1	2	B

**Question 13a. Should the greater emphasis be placed upon (check only one):**

Digital map and report publication 89%

Conventional paper map and report publication 11%

**Question 13b. With regard to digital products, how importantly do you rate products that are delivered in Geographic Information System (GIS) format, for example geoscience atlases?**

Very important 55%    Moderately important 41%    Not important 4%

**Question 13c. How important is (or will be) online internet access to geoscience data to your organization?**

Very important 75%    Moderately important 25%    Not important 0%

**Question 13d. Any additional comments on information activities? Are there additional services or resources that should be provided?**

Mineral Exploration group

- Digital map and report publications on CD-ROM should be compatible with most computers. Should be able to run on Windows 95 or 98.
- Information needs to be clear, concise and easily available and in the case of schools - at no cost.
- Claim maps should be updated more frequently and access through internet to claim database.
- Being small, not being GIS-fluent yet, difficult to predict needs.
- But priority should be a mine mineral land data (claims) library and available online.
- Important to maintain quality of assessment files.
- All assessment files stored outside the Natural Resources building should be re-indexed in an attempt to recover lost files and maps. A printer to reproduce microfiche maps to scale is needed.
- Funding needed to properly copy geofiles.
- Difficult to extract parts of present (GIS) atlas for presentation with other private data. Should be improved. Cost of digital data from GSC is too high. Some users, especially prospectors, do not have GIS capability.

Mineral Development and Mining group

- All geodata should be accessible by internet, including geofiles.
- Increase personnel in information services division. Current services stretched to limit in GSNL. GSC should sell publications in Newfoundland.

Petroleum and Natural Gas Industry group

- Internet access needs to be well thought out since much time is wasted, material is not up-to-date, books are easier to access and use, and files are not current.

Environmental geoscience and hydrology group

- Surficial and bedrock mapping in digital form for GIS based report is important to us.

Educational institution group

- This should be the first priority for both organizations.

Other activities group

- This is a valuable service for senior undergraduate and graduate students in MUN Earth Sciences Department. I think by the year 2000 and beyond, it will become more important.

**Question 13e. What should be the priorities for future information services?**

Mineral Exploration group

- More readily accessible digital map products.
- Better access and availability of geofiles and current reports, need for updated info catalogues on what's available.
- Digitize claims information.
- Online access of client-usable maps/data.
- Digitally filed maps and reports would be easier to store and reproduce. Internet access to files would be very useful for people outside the St. John's area.
- Geofiles; internet access.
- Improved accessibility. Public GIS stations at GSNL?

Mineral Development and Mining group

- Make existing information available on line. 2) Set up online publication sales in digital format.
- GSC presence. Review of home page information dedicated internet data inputter at both levels.

Petroleum and Natural Gas Industry group

- Flexibility, Accuracy, Current, User friendly, Pertinent.

Environmental geoscience and hydrology group

- Internet.
- Communication of geological messages to media and general population.

Educational institution group

- Get the marine database translated into maps e.g., @ 1:250k inshore; 1:500k elsewhere.
- Rapid availability of information.

Other activities group

- Continue above activity – all are important. 'Current Research' is a very valuable source of current activities – continue with this publication and utilize to the fullest, e.g., compilation of papers on a related theme, such as central mineral belt of Labrador, central mobile belt of Newfoundland.

**14. PROMOTION AND PUBLIC AWARENESS: No of responses = 21**

ACTIVITY	1-IMPORTANCE	2 - QUALITY	3 - PROVIDER
Industry oriented promotion	1	1	N
Schools and public awareness	1	2,3	N
Geotourism promotion	1	3	N

**Question 14a. Any additional comments on promotion activities? Are there additional services or resources that should be provided?**

#### Mineral Exploration group

- Continuation of public awareness and public education – This is essential in the maintenance of the teaching of the earth sciences at a high school level. If this is not done on a concerted level then the present policy of the elimination of these areas at the high school level will continue and will eventually be lost entirely. If this happens, then students will no longer be exposed and encouraged to pursue a career in the earth sciences and as with most of us I suspect any student in future who pursues this field of study will do so more by accident than by design. In a country such as Canada and a province such as ours, I personally feel that this would be a great loss of potential. We should not have to import earth science expertise - either into the country or the province - we need to concentrate on developing our own.
- A need for more effort.
- Regular news articles. Simplified version of Newfoundland Geology. Explanation of issues/ideas to the public/government officials.
- Survival of GSNL and GSC depends on major effort in public awareness.

#### Mineral Development and Mining group

- Encourage cooperation with industry associations – CIM/NALE/PDAC.
- Need to get past the overpass. NLCMR in cooperation with GSC/GSNL to coordinate monthly luncheon presentations. More belt-specific promotions – one selected each year for promos at Cordilleran and PDAC to add on to generic presentation as is.
- Focus on the schools. Don't want the schools to lose the geology programs given all of the mining and exploration that goes on within the province.

#### Petroleum and Natural Gas Industry group

- If industry doesn't know what is available they will not use the materials and the Province loses out on the effort.

#### Environmental geoscience and hydrology group

- Promotion in geosciences generally is not at an adequate level and will not be until media access improves and until the school boards welcome geological presentations. Changes in geoscience/environmental science curricula at all levels in the Newfoundland educational system (from K to MUN) are required, and are long overdue.

#### Educational institution group

- This should be done by partnership of whole geoscience community in province.
- School promotions are ad hoc. If this is deemed to be an important function, they should be carried out on a more objective basis.

#### Other activities group

- This requires more action such as developing a strategy or plan that will identify the problems or concerns and then an appropriate response. I submit that this should be over and above your present endeavors. Appoint someone on your staff to chair a Public Relations Committee?

## **Question 14b. What should be the priorities for future promotion and public awareness work?**

### **Mineral Exploration group**

- Geotourism should be a priority.
- The whole idea of public awareness “schools in particular” will be meaningless if there is no one remaining to address at a high school level in particular; this has to be the earth/geology classes. It cannot and will not be done through other areas and disciplines. In the end we all lose if we lost at the “Bottom” or (earth level) end.
- Education in the schools.
- Assign an individual to direct.

### **Mineral Development and Mining group**

- Focus on elementary school level.
- Find ways to integrate other stakeholder groups – environmentalists, park officials, etc. Deputy Ministers to defend importance of geoscience curriculum in high schools in both GSC and GSNL.

### **Petroleum and Natural Gas Industry group**

- Market the Province! Newfoundland is a long way away from the knowledge of the better numbers of North Americans. The rest of the world is even less knowledgeable. One sees that as one deals on the international scene. I can recount many instances where companies happened to be passing through to carry out business elsewhere in Canada, not knowing that what they wanted was right under their nose in Newfoundland.

### **Environmental geoscience and hydrology group**

- No use of print media (Telegram, Express) at present. Very unsatisfactory relationships with CBC, NTS especially the former. Newfoundland tourist guide contains several regrettable statements. Partnership with other provincial agencies (tourism, environment) is essential but hasn't really happened.

### **Other activities group**

- High! You have a wealth of knowledge and resource materials which should be adapted for the public in an easy-to-understand format. Provide direct assistance upon request.





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