

Record of the Western Canada Sedimentary Basin Workshop
Wednesday, May 2, 2001
PARC Meeting Room
3rd Floor, PTRC Building, 6 Research Drive, University of Regina

1.0. Attendance:

1.1 Representing GSC:

Jan Boon (Director General, Sedimentary and Marine Geoscience, GSC Ottawa)

Mike Cecile (Director, GSC Calgary)

Kirk Osadetz (Head, Energy and Environment, GSC Calgary)

Terry Poulton (Head, Paleontology, GSC Calgary)

Tony Hamblin (Head, Southern Mainland Section, GSC Calgary)

1.2. Representing other Alberta government agencies:

Cynthia Langlo (Senior Technical Advisor the Alberta Energy and Utilities Board [EUB])

Stefan Bachu (Head, Energy Section, Alberta Geological Survey [EUB])

Reg Olson (Head, Minerals Section, Alberta Geological Survey [EUB])

Jim Davidson (National Energy Board Project Manager, Natural Gas Ultimate Potential Commodities Business Unit)

1.3. Representing Saskatchewan Energy and Mines:

George Patterson (Executive Director, Exploration and Geological Services)

Chris Gilboy (Director, Petroleum Geology)

Kim Kreis (Project Geologist, Petroleum Geology)

Fran Haidl (Project Geologist, Petroleum Geology)

1.4. Representing Manitoba government agencies:

Jim Bamburak (Project Geologist, Sedimentary and Industrial Minerals)

Rick Halas (Manitoba Trade and Investment)

by speaker phone:

Carol Martiniuk (Senior Petroleum Geologist and Manager, Administration and Geology, Petroleum Branch, Mineral Resources Division)

Michelle Nicolas (Petroleum Geologist, Petroleum Branch, Mineral Resources Division)

1.5. Representing British Columbia Energy and Mines:

Derek Brown (Manager, Economic Geology Section, Geological Survey Branch)

1.6. Representing USGS (Denver, Colorado):

Jennie Ridgley (Project Geologist)

1.7. Representing industry and NRCan Minister's National Advisory Committee (MNABES):

Dean Potter (Sito Geoconsulting Ltd.)

2.0. Welcoming remarks were given by the WCSB Workshop 2001 Chair, Chris Gilboy. This was immediately followed by GSC presentations.

3.0. Presentations

3.1. Geological Survey of Canada

8:30 - Tony Hamblin reported on 20 current GSC activities in the WCSB. The GSC is involved in five mapping projects in the following areas: southeastern Cordillera, central foreland, Kananaskis, and Bow/Athabasca. Details of these and other GSC projects described by Tony are given in the GSC Power Point presentation included on the accompanying CD. Next, he introduced 12 projects under the heading, "Stratigraphic Studies, Surface and Subsurface". Three other studies were outlined under the general heading, "Structural Studies, Surface and Subsurface". None of the current projects has budget approval beyond this year.

8:43 - Kirk Osadetz summarized Energy and Environment activities within GSC Calgary. These activities fall under the following broad headings: Hydrogeology Studies, Emissions Monitoring, Coal Bed Methane and Coal Studies, Petroleum Systems and Resource Assessment Studies and Mineral Resource Studies. Details of each of these can be found in the GSC Activities Power Point presentation on the accompanying CD. Kirk emphasized that a reorientation of resources to conventional frontier regions like the Mackenzie Delta, Beaufort Sea and the east coast offshore is in effect, and that new GSC priorities effectively reduce the availability of resources for WCSB studies.

Q/A or Comment

Jan Boon commented that a potable-water national project is currently being considered and is likely to have a high priority, particularly in the light of recent media attention given to reports of biological contamination of certain Canadian drinking water supplies and the obvious associated health problems. Jan also identified CBM as having a high profile. He invited participation from any potential partners in a scoping study of CBM. This study would attempt to address questions like: Where is the coal? What depth? What kind of coal? What is the gas content, etc.? He suggested that SEM may want to participate and should talk to Dave Hughes with GSC Calgary.

Kirk suggested that considerable geochemistry work remains to be done in the WCSB but the current focus on frontier areas will effectively postpone concerted efforts in this direction.

9:11 - Terry Poulton described nine groupings of projects/activities representing 35 different projects in the WCSB involving paleontological investigations. They varied in geographical extent from eastern BC to the Hudson Bay Lowlands and in stratigraphic range from the Cambrian to Early Tertiary. Terry spoke of the wide range of services and opportunities to collaborate with paleontological experts within GSC Calgary.

Q/A or Comment

Jan Boon informed the group that the GSC is currently re-evaluating the role of all labs in the country. He suggested that "if they are doing things that can be done better elsewhere, they will likely be let go".

9:16 - Tony Hamblin reported on a variety of projects related to mineral deposits, groundwater, geochemical surveys and climate change. Details available from CD.

9:22 - Jan Boon and Mike Cecile outlined GSC goals under the following broad headings: Geoscience Knowledge, Information Technology/ Management, Sustainable Development (minerals, energy, water), Climate Change, Environmental Stewardship and Natural Hazards. Details of these can be found on the accompanying CD.

Q/A or Comment

Considerable discussion took place around the shift in GSC focus on frontier areas away from the WCSB. A general consensus was reached that the GSC would be challenged to find resources to support geoscience efforts in the WCSB. Kirk Osadetz commented that projects which are a high priority for the provinces may not be for the GSC under its current mandate. He offered that a creative solution to this problem may be what the Yukon has done. The Yukon has come up with its own money for projects and buys expertise from industry. It also solicits technical support from the GSC. Jan Boon supported this because it circumvents inflexibility in GSC but still allows for their support. Kirk said the advantage to this approach is that it allows provinces to carry forward their priorities and develop expertise with GSC support. Derek Brown expressed some concern that this approach may lead to "geoscience to the highest bidder". Jan Boon countered this concern by indicating that support by the GSC for any project will be scrutinized under a national framework of priorities.

A number of participants expressed hope that the Co-operative Mapping Strategies initiative may become an officially funded program. Approximately 250 million dollars (including provincial contributions) are estimated to be the funding requirements for this program over a 10- to-20-year period. Perhaps Saskatchewan's increase in budget in support of this project will be an aid to leveraging money at the federal level. The general consensus was that a program such as this would go a long way in supporting research in the WCSB.

3.2. National Energy Board

9:45 - Jim Davidson described current work by the NEB on conventional oil and natural gas. He also discussed the problem of quantifying unconventional natural gas, CBM and frontier resources. Future resource assessments would be focused on the WCSB and northern frontier regions. He identified a number of needs in this assessment work. Firstly, there is a need to revise estimates of conventional natural gas resources in key supply basins. Secondly, the NEB will attempt to address the challenge of assessing unconventional natural gas resources such as CBM in western Canada and from the east coast of Canada, and from potential gas resources contained in shales and tight sands.

Q/A or Comment

There was considerable discussion around getting information out into the public domain. Cynthia Langlo suggested that many companies involved in the present exploration phase for CBM are not reporting their activity or findings. However, she is confident that once they go into production, the regulations will ensure these data become publicly available.

3.3. Alberta Geological Survey

9:54 -Stephan Bachu (EUB) described the structure and role of the Alberta Geological Survey. The survey is primarily responsible for the characterization and dissemination of geoscience information in Alberta in support of industry and government activities. Much of this information is published in the form of maps (bedrock, surficial and geochemical) and reports. Details about the survey and its activities are well illustrated in the accompanying Power Point presentation on the accompanying CD.

10:11 - Reg Olson presented an overview of the Mineral Resources Program in Alberta. He stressed the need to provide better bedrock, geochemical and surficial mapping coverage in support of mineral and aggregate exploration in the province, and indicated the urgent need to identify sources of aggregate in Alberta. Currently, aggregate is managed by Alberta's Environment department, making it somewhat awkward for the AGS to be involved.

3.4. Manitoba Geological Survey

10:55 - Jim Bamburak presented the organizational structure, budget, and main projects undertaken by the Sedimentary and Industrial Minerals Section over the past year. Projects fell under broad headings such as Metallic and Industrial Minerals, Stratigraphic and Surficial Mapping and Land Use. The details of these projects can be found in their Power Point presentation on the CD accompanying these minutes.

Carol Martiniuk and Michelle Nicolas with Manitoba's Branch participated in the meeting by speaker phone while Jim Bamburak presented their slides Carol Martiniuk described the Branch's mandate (regulatory and technical), organizational structure and technical role (to conduct geological field and regional studies, and to provide consultation to industry and public) and summarized its current and future projects (see accompanying CD).

3.5. BC Geological Survey (Ministry of Energy and Mines [MEM])

11:30 - Derek Brown introduced the agencies responsible for oil and gas in BC and their roles. He also described the limited but growing energy-related geoscience capacity within MEM. Currently there are two petroleum geologists with a land-tenure function and one coal geologist who is field-based. Hiring additional professional staff is anticipated in the near future. Oil and gas has brought in approximately \$1.3 billion in direct revenue to the province in the year 2000. This income is expected to grow through

increased efforts in gas exploration and development. Coal-bed methane (CBM) is currently being given much attention in BC. Over \$20 million has been collected for CBM gas rights in 1999/2000. The MEM will further efforts in geoscience and new initiatives to promote new basins in the province. A budget increase from 40 to 44 million for the ministry as a whole has been announced for 2001.

Q/A or Comment

Jennie commented on CBM development in the San Juan and Powder River basins, and the Uinta Basin in Utah. She warned that water contamination and dewatering of coals in the production of CBM are serious problems for governments to deal with. As soon as you start partnering with industry there are complications. This is murky water for a government geoscientist. The USGS tries to stay impartial and be very careful to work with consortia and not one or two companies. She strongly encouraged the WCSB Working Committee to explore what has been learned from the U.S. experiences.

3.6. Saskatchewan Energy and Mines

11:56 - Chris Gilboy outlined the current and planned research for the Saskatchewan portion of the WCSB. Most of the projects fell under the following headings: Co-operative Mapping Strategy, Weyburn CO₂ Monitoring and Storage, Shallow Gas, Diamondiferous Kimberlites, Mannville, Geoscape Southern Saskatchewan and Brines. Details of these can be found on the accompanying CD.

12:15 - George Patterson outlined recent positive funding developments in Saskatchewan on both the mineral and petroleum sides of SEM. This funding will result in a greater capacity by SEM to support geoscience research efforts in Saskatchewan both internally and through anticipated cooperative efforts with the GSC, universities and other provinces.

3.7. United States Geological Survey (USGS)

12:58 - Jennie Ridgley reported that recent past activities by the USGS have focused on assessing the shallow biogenic gas potential in Montana through a regional framework covering geology, gas geochemistry and hydrogeology. Much of the data used in this evaluation have come from southwestern Saskatchewan and southeastern Alberta. Current activity is focused on development of a model to understand the variables and processes related to shallow biogenic gas in Upper Cretaceous rocks such as the Eagle/Milk River and Belle Fourche formations. Some of the goals of the project include: an understanding of gas geochemistry, migration and exsolution, and hydrology. This project will try to relate these data to basin-centred gas accumulations in low permeability rocks. There appears to be an opportunity for the GSC and provinces to work cooperatively with the USGS in the development of a resource methodology in the area of unconventional gas accumulations. This project has the potential to characterize a very large and currently under-exploited gas resource in both the United States and Canada.

Q/A or Comment

Kirk asked Jennie if it is necessary to have low permeability reservoirs to have an unconventional gas resource and does that not cause poor production? Jennie answered, "Not necessarily, if abundant methane is present in ancient buried waters, abundant gas can be stored. After burial and upon uplift gas comes out of solution and can be trapped in conventional and unconventional reservoirs. Low permeability simply enhances retention in some instances". Some data are available on the USGS website. The USGS gives out its CDs at no cost. Jennie offered to work with GSC and provinces on gas resource assessment.

3.8. Results of a questionnaire to industry

1:21 - Mike Cecile presented his report (see CD).

3.9. Industry Observer

1:37 - Dean Potter was invited to give his thoughts on the meeting. Dean spoke eloquently of the need for an integrated geoscience framework. The search for natural resources is fundamentally a knowledge-based industry. Exploration ideas and models are dependent upon basic geological data. He suggested that historically (*e.g.* 1950s) Saskatchewan supported government research in an effort to promote the hydrocarbon potential of the province and met with great success. Since those times, this support has been progressively eroded to a point where there is not enough regional geological research published to promote new exploration plays. A similar problem exists in Alberta. He also observed that often projects are too myopic in their scope. He cited the USGS unconventional gas study presented by Jennie Ridgley and the GSC/SEM project to collect and geochemically characterize Saskatchewan's oils as models for an integrated approach to resource evaluation through government-directed research. Industry welcomes geoscience projects that are able to integrate basic geological data that promote new plays or new ways of looking at maturely explored areas. These kinds of data strongly encourage exploration dollars to be spent by companies.

Dean warned that there is a serious knowledge gap in companies today. Since little or no mentoring is taking place in oil companies, the knowledge gained over a career is often lost as senior professional staff retire. He applauded the initiative by SEM with its increase in budget to embark on the development of local geological expertise by recruiting students and offering the potential for a career in research. Dean recognized that this will be challenging since, "It is hard to compete with an industry where a good prospect generator probably makes \$150,000 per year ... you'll need to foster the people you want right from the graduate level". He supported the prospect of "...co-operatively developing ideas" and saw a significant role for the GSC in this respect.

He was hesitant to join the CBM band wagon and warned against expending too many efforts in that direction. He qualified this by reminding the group that the oil industry is notorious for its "herd mentality".

4.0. Priority Setting

2:00 - Chris expressed his concern about the focus by the GSC into conventional frontier areas. He explained that from Saskatchewan's perspective, "there is an absolute necessity to have access to GSC expertise and lab facilities". He asked that Jan Boon take back to Ottawa our concerns and gaps in geoscience information in the WCSB, and the very real need for GSC involvement. Chris used the estimate by Dale Leckie, a senior explorationist with Nexen, that 57% of the oil in Saskatchewan is yet to be discovered. Mike Cecile suggested we get together to compare notes and take advantage of opportunities collectively. George Patterson cited the Ex-Tech program as an example of a highly successful co-operative effort including: three provinces, four universities, and both federal and provincial governments. There was a general consensus by workshop participants that there are opportunities to work together and to get resources collectively.

5.0. Wrap-up

5.1. Chris invited the group to list reasons for having WCSB meetings. 4:00 - These are listed below:

- 1) Establish common needs.
- 2) Sharing capacities between government, universities and industry.
- 3) No individual organization has enough resources to be truly effective/efficient.
- 4) Set common priorities.
- 5) Co-operative Mapping Strategy is perceived as the current vehicle to facilitate collaboration. Must encourage industry to lobby Ottawa (Ralph Goodale, Paul Martin).
- 6) Explore options how to get oil companies to become more politically active.
- 7) Data integration and CBM are of common interest to BC, Alberta and Saskatchewan.
- 8) Need to commit to collaboration.
- 9) Growing recognition that the tectonic history of WCSB is of interest to all provinces.
- 10) Recognition that differing budget cycles between agencies are sometimes a problem in geoscience collaboration efforts.
- 11) Recognition that there are different reporting mechanisms between agencies (e.g. reports, open file reports, internal reports, papers, etc).
- 12) Provinces provide GSC with statistics like: oil, gas, mineral production, number of people employed, value of commodity to province etc).
- 13) National Geoscience Accord defines the roles of the GSC and provincial surveys.
- 14) The following are identified as being high priorities for both the GSC and most provinces:
 - a) CBM research
 - b) Data integration
 - c) Marketing of geoscience programs to industry, government and the general public (Manitoba has done a very good job)

d) Hydrogeology.

- 15) Make business case to governments that there is an economic return on investment in geoscience that will support other government programs like health-care and education.
- 16) Resource policy development must be linked to geoscience programs.

5.2. Chris invited summary comments from workshop participants:

Jan Boon

- *Working in the WCSB is difficult in a time when the GSC is de-emphasizing it. If we can convince the federal and provincial governments to proceed with the Co-operative Mapping Strategies it would go a long way toward addressing the needs of the WCSB.*
- *From GSC's perspective CBM is a current priority on which we can work together. Data management is another high priority area – we have all underestimated what it costs and how long it takes. This is area in which we can co-operate immediately under GSC's current mandate (i.e. not limited to the WCSB). Concerns around CO₂ emissions and/or sequestration are areas of commonality. This would fall under “Climate Change” and can be supported under that umbrella.*
- *There is merit in a common marketing approach. Perhaps we should use a professional marketing resource to sell our programs to industry and government.*
- *Our minister, Ralph Goodale, must hear from industry for supporting provinces.*
- *Do not underestimate the usefulness of meetings like this to learn of the needs and strengths of all our various jurisdictions. This meeting was very helpful in this regard.*
- *Talk to your provincial Canadian Geoscience Knowledge Network (CGKN) representative to find out the program's current standing.*

George Patterson

- *Having a voice from industry championing our needs by direct communication with politicians is necessary. The petroleum industry has not done this until recently in Saskatchewan, but when they did (e.g. through Mike Monea), it precipitated an immediate and positive response (\$500,000 increase in annual budget to Petroleum Geology Branch of SEM).*

Mike Cecile

- *Highly value industry representation. Should explore the possibility of getting representation with a general geoscience perspective on the committee in future meetings. Perhaps, somebody from the CSPG or SEG.*
- *Consider getting a representative from North Dakota and Montana.*
- *Next Meeting in Edmonton (Stefan Bachu or Reg Olson to Chair). Date to be announced.*

Tony Hamblin

- *Enjoyed the opportunity to meet with other surveys.*

- *In future meetings, we probably don't need to take up as much time or go into so many details of individual survey projects as we did this time.*

Derek Brown

- *Work on a common document that expresses our concerns that we need a regional synthesis in which we can all participate. In this document, demonstrate to federal government that investing in the geoscience framework will promote economic development that will pay for government programs.*
- *We need to develop a marketing strategy designed to attract more resources from governments.*
- *Very useful to hear what everyone is doing.*

Jennie

- *Jennie would urge us to think beyond the conventional. Step away and look for potential that is unconventional.*
- *Identify what expertise provinces need from the GSC? Kirk identifies the labs at the GSC, biostratigraphy, geochemistry and geophysics.*
- *The meeting was somewhat of a cultural shock in the broad nature of some of the issues raised between the provinces and the GSC. This format is a good vehicle for communication.*

Reg Olson

- *We currently suffer from a lack of financial commitment from governments. My experience from working in industry suggests that funding from industry is also unlikely. They already pay royalties and taxes.*
- *Funding under the Co-operative Mapping Strategies is likely to be supported.*
- *There is a need from the provincial surveys for access to GSC labs and expertise.*
- *Hydrogeology may be an area in which provinces and the GSC have a common interest and may be able to co-operate under current mandates.*
- *Basement structure is important to everyone. We should work together on understanding the basement of the WCSB. There should be no faults along the Alberta/Saskatchewan border with regards to "Prairie Gold" possibilities.*
- *We should move towards a common data sharing mechanism in Canada. The GSC will play a major role in co-ordinating this effort.*
- *Heavy oil may be something that Alberta and Saskatchewan may want to tackle together.*
- *Many thanks to Jan Boon for coming. His presence was very important to the group.*

Cynthia Langlo

- *Poll industry to discover their needs and concerns We have to be pro-active.*
- *Obtained a good appreciation for the need for government involvement in geoscience framework. Learned much about what everybody's needs are.*

Stefan Bachu

- *We will not find a project that everybody can agree on. If we can find areas of co-operation, we should proceed.*

Kirk Osadetz

- *We come from different organizations with different mandates to some extent. Perhaps we should come to some agreement as to what projects can be shared as a common thread. It could form the basis for further dialogue. Under current mandates, these appear to be: 1) Mapping Strategies, 2) CBM and 3) common data formats.*
- *The ExTech program is an example of a highly leveraged GSC/provincial program. A similar approach with the National Mapping Program would include the WCSB and would be very useful.*
- *This meeting helps to identify areas of commonality and areas of differences.*
- *If US gas consumption reaches 2 TCF, the estimated reserves at Prudhoe Bay would represent less than 2 years' supply.*
- *This meeting should benefit Jan and Mike in their new roles.*
- *Personally, I question if the GSC is on the right track in de-emphasizing the importance of the WCSB. We put ourselves in a precarious position by lessening our role in the WCS. The WCSB plays a critical role in the economic well-being of the country.*

Dean Potter

- *It is important to try to know if what you do is useful to your clients.*
- *I like the idea that SEM publishes a Summary of Investigations.*

Jim Davidson

- *Focus on concrete topics in future meetings.*

Kim Kreis

- *There are many opportunities for collaboration on projects in the WCSB between the provinces and between the provinces and the GSC. The provinces have a real need for GSC expertise in areas such as paleontology, geochemistry and geophysics.*

Jim Bamburak

- *We can all work on basement tectonics.*
- *This meeting provides an excellent forum in which to exchange ideas and to identify areas for collaboration.*
- *Appreciated all comments. It was a good meeting and well worth the trip.*

Rick Halas

- *Greatly appreciated the exchange of information. It is critical to get industry involved but be cautious of becoming so focused on a few industry projects that it limits your overall view. Try to focus on a few themes for the next meeting.*

Fran Haidl

- *Geoscience knowledge is the key to much of the future potential economic development in Canada.*

Carol Martinuik

- *Appreciated the opportunity to participate in the meeting on behalf of the Petroleum Branch.*
- *We all have similar goals and an opportunity to work together.*
- *Manitoba has co-operated and benefited in collaborations with the GSC in the past and looks forward to doing so in the future. For example, Kirk's oil-typing work had a very positive economic impact on oil exploration in Manitoba. She asks for the GSC to seek a balance between conventional frontier areas and the WCSB.*
- *Manitoba would like to know what the project selection mechanism is at the GSC. Also, would like to cooperate with cross-border projects.*

Chris Gilboy

- *Thanks to Mike Cecile for making my job easier in holding this meeting.*
- *Really appreciate the open communication. Thanks again to Jan for coming. It is important to build direct links with Ottawa. It is also a terrific opportunity to make linkages with all our counterparts in other jurisdictions.*
- *There seems to be a rare opportunity to map systematically across the WCSB from basement up using sophisticated computer technology to store and present a wide variety of data in ways that will be usefully adapted to the needs of all participants in hydrocarbon exploration and development.*

6.0. Action Items:

Four projects on which the GSC and provincial surveys can co-operate under the current GSC mandate:

- 1) Coal-bed methane research.
- 2) Tectonic history of Western Canada Sedimentary Basin. Get input from people like: Alberta, Manitoba (Ruth Bezys, Carol Martinuik, Michelle Nicolas), British Columbia, Saskatchewan (Zoli Hajnal, Ken Ashton, Ralph Maxeiner, Jurgen Kraus, Kim Kreis, Fran Haidl, Jim Christopher, Don Kent). Report ideas in August.
- 3) Develop a communication strategy that would invite the federal government to invest in the Co-operative Mapping Strategies (WCSB). Task leaders: Grant Mossop-GSC; Kirk Osadetz-GSC, Cynthia Langlo-Alberta, Carol Martinuik-Manitoba, Chris Gilboy-Saskatchewan.
- 4) Data Integration. Each jurisdiction will talk to their respective representative and provide updates on geoscience network developments and problems as they relate to the Western Canada Sedimentary Basin. Carol Martiniuk will be the co-ordinator.