

REVIEW 2015

Newfoundland
Labrador
Natural Resources



DEPARTMENT OF NATURAL RESOURCES

Hon. Derrick Dalley	Minister	729-2920	DerrickDalley@gov.nl.ca
Charles Bown	Deputy Minister	729-2766	cbown@gov.nl.ca
David Liverman	Assistant Deputy Minister	729-2768	dliverman@gov.nl.ca

MINERAL DEVELOPMENT DIVISION

Director's Office

Alex Smith	Director	729-6379	asmith@gov.nl.ca
------------	----------	----------	------------------

Mineral Industry Analysis Section

Vacant	Manager	729-6445	
Bernie Brazil	Clerk-Typist III	729-6380	berniebrazil@gov.nl.ca
Vacant	Mineral Industry Analyst	729-6409	
Bernadine Lawlor	Mineral Industry Analyst	729-6940	bernadinelawlor@gov.nl.ca
Keith Bradbury	Mineral Industry Analyst	729-5811	kbradbury@gov.nl.ca
Gord Button	Mineral Industry Analyst	729-5830	gordbutton@gov.nl.ca

Mineral Incentive Program

John Clarke	Manager	729-5851	jclarke@gov.nl.ca
Sharon Tracey	Clerk-Typist III	729-6405	sharontracey@gov.nl.ca
Dale O'Reilly	Geologist I	729-6448	daleoreilly@gov.nl.ca
		1-855-729-6448	

Engineering Analysis Section

Vacant	Manager	729-6439	
Abigail Steel	Mineral Development Engineer, Environment	729-6449	abigailsteel@gov.nl.ca
Paul Philpott	Mineral Development Engineer	729-2358	paulphilpott@gov.nl.ca
Muhammad Qureshi	Mineral Development Engineer	729-4408	muhammadqureshi@gov.nl.ca
Darren Pittman	Mineral Development Engineer, OAM	729-6512	darrenpittman@gov.nl.ca
Brad Way	Geologist III	729-1582	bradway@gov.nl.ca
David Tite	Financial Officer	729-7657	dtite@gov.nl.ca

MINERAL LANDS DIVISION

Director's Office

Kevin Sheppard	Director	729-6425	kevinsheppard@gov.nl.ca
Anne Marie Woolridge	Clerk Stenographer III	729-2773	annemariewoolridge@gov.nl.ca

Exploration Approvals and Inspections

Heather Rafuse	Geologist	729-6408	heatherrafuse@gov.nl.ca
Matthew Snow	Exploration Site Inspector	729-5634	matthewsnow@gov.nl.ca
Vacant	WPEO		

Mineral Rights Section

Justin Lake	Manager	729-6437	justinwlake@gov.nl.ca
Stephen Hinchey	Project Geologist	729-5748	stephenhinchey@gov.nl.ca
Charles Newhook	Geological Technician	729-4020	charlesnewhook@gov.nl.ca
Laurie Hennessy	Clerk IV	729-4697	lauriehennessy@gov.nl.ca
Trina Adams	Review Geologist	729-0573	trinaadams@gov.nl.ca
Brenda Lynch	Receptionist	729-6849	brendalynch@gov.nl.ca

Quarry Materials Section

Gerald Kennedy	Manager	729-6447	geraldkennedy@gov.nl.ca
Joanne Janes	Clerk IV	729-4044	jjanes@gov.nl.ca
Ges Nunn	Project Geologist	729-6418	gesnunn@gov.nl.ca
Kirby Way	Quarry Material Compliance Officer	686-2054	kirbyway@gov.nl.ca
William Oldford	Quarry Material Compliance Officer	292-4503	williamoldford@gov.nl.ca
Andrea Devereaux	Quarry Material Compliance Officer	729-6410	andreadevereaux@gov.nl.ca

Core Storage Program

Glen Penney	Project Geologist	729-5833	GlenPenney@gov.nl.ca
Chris Moran	Geologist	686-2054	chrismoran@gov.nl.ca

DEPARTMENT OF NATURAL RESOURCES

Mines Branch Review 2015

The Mines Branch is responsible for managing the province's mineral resources to ensure that its contribution to the economic and social well-being of the province is maximized, sustained and enhanced; increasing the body of knowledge on the province's mineral resources; encouraging the orderly exploration and development of these resources; assessing their economic potential and economic contribution to the province; formulating mineral policy and providing advice to government on all mineral related matters. The branch operates under the departmental vision of Newfoundland and Labrador as a province that realizes the full benefit from the sustainable development of its natural resources.

The mineral sector continues to face weak prices for many commodities, but the value of mineral shipments is forecast to increase slightly from 2014, largely due to increased production in the iron ore sector. Employment in the mining sector is expected to decline from 2014 levels due to lower construction employment at the Long Harbour nickel processing plant, and the closure of the Duck Pond mine.

Mineral shipments and exploration expenditures will remain robust. Gross value of shipments for 2015 is expected to be about \$3.2 billion, compared to \$2.9 billion for 2014. Mineral exploration expenditure is forecast to decline to \$62.4 million (from \$77.3 million in 2014), reflecting global challenges for junior companies in obtaining financing in current market conditions.

The Mines Branch has three divisions: the Geological Survey, the Mineral Development Division, and the Mineral Lands Division.

The Geological Survey of Newfoundland and Labrador is responsible for mapping the geological framework of the province to interpret and explain its geological evolution, and to describe, interpret and explain the distribution, nature, quantity and origin of the province's mineral resources.

The Mineral Development Division is responsible for the technical and economic analysis of the mining industry in the province. It also provides training and assistance for prospectors, and provides advice to all provincial and federal government agencies that provide financial support or assistance to mining projects.

The Mineral Lands Division is responsible for legislation and regulations governing the administration of the province's mineral and quarry material resources and their exploration and development.

The Geological Survey had an active field program, mounting 8 field programs (3 in Labrador, and 5 on the island). New initiatives included surficial mapping and till geochemistry in the northern part of The Topsails, bedrock geological mapping in the Archean Ashuanipi Complex of western Labrador, and volcanogenic massive sulphide (VMS) research in central Newfoundland. Projects on iron-ore in western Labrador, gold metallogeny in central Newfoundland, deposit-level studies of uranium in the eastern part of the Central Mineral Belt of Labrador, bedrock mapping on the Bonavista Peninsula and in western Newfoundland all continued. In addition, a study was initiated into 350-million-year old tetrapod tracks found in a quarry in western Newfoundland; these tracks are the first recorded evidence of tetrapods found in the province and are a significant discovery. Partnerships with the Geological Survey of Canada continued to improve our geoscience knowledge in the province.

The Mineral Incentive Program continues to provide important financial support to junior exploration companies and prospectors; a total of \$1.5 million was allocated to this program in 2015-16. The branch has a strong commitment to prospector training; however, the annual training course did not go ahead in 2015 due to low registration, but a new program of 'Introduction to Prospecting' workshops is planned through the rest of the year, covering many parts of the province.

The Mineral Lands Division has continued enhanced efforts in ensuring compliance to exploration permit conditions with an inspection program, as well as working with exploration companies to minimize environmental impact through following best practices. In the past year the division has been evaluating its management of the quarry/aggregate industry, with the objective of improving the ability to regulate this growing sector.

2015 continues to be challenging for the global mining and exploration industry, but mining projects continue to progress in the province. The province, however, remains an attractive prospect for future investment, with high mineral potential, large areas that are considered under-explored, a stable legislative and taxation framework, and a population that understands the importance of natural resource development. Mining will continue to be a major contributor to employment and economic development in the province.

The Mines Branch is undergoing a period of internal transformation as a number of staff retired over the course of the last year. Notable retirees include Jim Hinchey, Len Mandville, Tony Burgess, John McConnell, Jerry Ricketts, Lew Higdon, and Andy Kerr. These people provided many years of dedicated service to the Mines Branch, and their contributions are appreciated. They will be missed but we are fortunate in being able to recruit well-qualified people to fill their positions, and I am confident that the high standards that they helped establish will continue.

David Liverman
Assistant Deputy Minister Mines

GEOLOGICAL SURVEY

Three goals of the Departmental Strategic Plan are to enhance the knowledge-base of geoscience, to identify opportunities for resource development, and to improve the promotion of these opportunities. The 2015-16 programs of the Geological Survey of Newfoundland and Labrador (GSNL) directly address these goals mainly through its field programs, publications, retention of qualified staff, and successful promotional activities. Budget 2015 awarded GSNL \$5.5 million.

More than \$1.3 million was again allocated to field activities this year. In Labrador, there were three projects: 1) Deposit-level studies of several prominent uranium deposits in the eastern part of the Central Mineral Belt, 2) Bedrock geology mapping in the Archean Ashuanipi Complex of western Labrador, and 3) Continuation of a project to study the iron-ore deposits of western Labrador, focussing on deposits east of Schefferville, along the Labrador-Québec border.

On the island, five field projects were conducted: 1) A new project examining volcanogenic massive sulphide (VMS) deposits and potential environments in central Newfoundland, 2) Continuation of work on gold metallogeny in central Newfoundland, 3) Bedrock mapping on the lower Paleozoic platform near Corner Brook and Gros Morne National Park, 4) A 1:50 000-scale bedrock mapping project on the northern Bonavista Peninsula, and 5) Surficial mapping and till geochemistry of the northern part of The Topsails. In addition, the Geological Survey conducted research on recently discovered tetrapod trace fossils in the Pynn's Brook area of western Newfoundland. These 350-million-year old tracks are an exciting find, representing the first evidence of tetrapod trace fossils in the province.

Office-based research studies continued on the results of several lake-sediment, stream and till geochemistry projects; data and map compilation for inclusion in Geoscience Online, including bedrock, surficial, mineral occurrence and geophysical data; a synthesis of the geology of eastern Labrador; a synthesis of the geology of parts of northern Labrador; bedrock geology mapping of the Mesoproterozoic Seal Lake Group in Labrador; the regional geology of uranium in the Central Mineral Belt of Labrador; detailed systematic description of Cambrian trilobite fossils found in the Hawke Bay Formation (Labrador Group); the till geochemistry of the central volcanic belt of Newfoundland; granular aggregate assessments of parts of insular Newfoundland; geological mapping of the Buchans-Robert's Arm volcanic belt in central Newfoundland; and data processing from the Coastal Monitoring program. Laboratory geochemical analysis of lake sediment and water, till and rock samples collected in 2014 continued on the Geological Survey's ICP-ES and ICP-MS analytical equip-

ment. In addition, updates to the Mineral Occurrence Data System were ongoing, and processing of the Geological Survey's paleontology collection at The Rooms continued.

The Geological Survey's geoscience program employed 15 summer field- and office-support students, most of whom are enrolled in Earth Science or Geography programs at Memorial University. As well as assisting the GSNL, this employment with the Survey provides future geoscientists with a valuable opportunity to train with our experienced field and office staff.

The GSNL leads the minerals promotional efforts of the Mines Branch. The branch had a strong presence at the traditional venues (Mineral Resources Review in St. John's, Baie Verte Mining Conference, Expo Labrador in Happy Valley-Goose Bay, Exploration Roundup in Vancouver, Québec Exploration in Québec City, and the PDAC in Toronto), and again was part of the Canadian delegation at the China Mining meeting in Beijing and associated meetings in other Chinese cities. Visiting delegations from the China Geological Survey and various Chinese minerals industry groups were also assisted by the Survey.

Staff Changes

There have been several staff changes in the Survey this year. Several long-standing members of the Geological Survey retired. Andy Kerr (Senior Geologist, Mineral Deposits Section), Jerry Ricketts and John McConnell (Geochemistry, Geophysics and Terrain Sciences Section), each had careers spanning over 30 years with the public service, and each made tremendous contributions to the Geological Survey for which they are duly acknowledged. In addition, Cordell Deering left the Survey and was promoted to take up a position as Natural Resources Departmental Program Coordinator.

Joining the Geological Survey was Crispin Pike as Mineral Inventory Geologist I to replace Marina Schofield, who has left to pursue an academic career. Several positions are currently in competition, all of which should be filled before Christmas 2015.

In an attempt to maintain the corporate knowledge and scientific expertise of our retiring geoscientists the Geological Survey has implemented an Emeritus Program. This program is open to all retired geoscientists, and we expect to announce our first Emeritus Geoscientist in the near future.

Linkages and Partnerships

The GSNL benefits through linkages and partnerships with other branches of government, provincial, national and international, with academic institutions and non-governmental organizations, and with national and international geoscience organizations. The partnership between the

Canadian Institute of Mining, Metallurgy and Petroleum (CIM; Newfoundland Branch) and the Mines Branch of the Department of Natural Resources results in the joint annual Mineral Resources Review conference. The partnership between the Geological Survey, and the CIM (Newfoundland Branch) and the Department of Education continues with the preparation and distribution of 'rock kits', a collection of provincial rocks and minerals for use in schools. The Mines Branch is in partnership with the CIM (Newfoundland Branch), Mining Industry NL, and PEGNL for the promotion of Mining Week. With the Department of Business, Tourism, Culture and Rural Development, the Geological Survey is helping to develop the province's geotourism potential, including the Aspiring Geopark proposal on the Bonavista Peninsula, and the Aspiring Cabox Geopark in the Bay of Islands region, as well as continuing work on the province's paleontological and other initiatives such as the World Heritage Status proposal for Mistaken Point. The GSNL works closely with the Department of Environment and Conservation on groundwater issues, and with the Department of Environment and Conservation and the Office of Climate Change and Energy Efficiency on issues related to climate change, and provides advice to Fire and Emergency Services - NL and also to the departments of Transportation and Works, and Municipal and Intergovernmental Affairs, and municipal councils on potential geological hazards. The GSNL also provides geological expertise to the Department of Transportation and Works for the assessment of submitted aggregate samples, used in road construction and asphalt paving. A long-standing relationship with the Geological Survey of Canada continues with the multidisciplinary projects as part of the GEM2 and TGI initiatives.

As well as servicing the exploration and prospecting community, mainly through our Geoscience Publications and Information Section, GSNL partners with Mining Industry NL on the Matty Mitchell Prospectors Resource Room. Some of our staff also instruct at prospecting courses organized by the Mineral Development Division, Mines Branch. Several geologists have adjunct appointments in the Earth Sciences and Geography departments at Memorial University, and serve on supervisory committees for graduate students. A consultative relationship has also been established with the Newfoundland and Labrador Research and Development Council (RDC). We also provide direct and indirect support for research projects at Memorial University, and other academic institutions. The GSNL is a strong supporter of the geoscience community in the province, with several staff members holding significant positions in the national and local branches of the Geological Association of Canada, the Canadian Institute of Mining, Metallurgy and Petroleum, the Canadian Quaternary Association, and the Atlantic Geoscience Society. Several staff were on the organising committee for

this year's National biennial meeting of the Canadian Quaternary Association hosted at Memorial University in August.

Organizational Structure

The GSNL is organized into five sections under the direction of Martin Batterson. The sections are Geoscience Data Management (Senior Geologist Larry Nolan), Mineral Deposits (Senior Geologist John Hinchey), Regional Geology (Senior Geologist Alana Hinchey), Geochemistry, Geophysics and Terrain Sciences (Senior Geologist Steve Amor), and Geoscience Publications and Information (Senior Geologist Sean O'Brien). The Geochemistry Laboratory, part of the Geochemistry, Geophysics and Terrain Sciences Section, is under the direction of Chris Finch.

Director's Office

The Director's office is responsible for the administration of the GSNL, logistical support of office- and field-based programs, and liaison with other divisions in the Mines Branch. The Director represents the GSNL on the Committee of Provincial and Territorial Geologists and the National Geological Surveys Committee. With Government's commitment to long-term funding of geoscience, the GSNL is proceeding with development of its five-year plan for the period 2015–2020, a plan that will be discussed with our Technical Advisory Committee, which consists of representatives of the mineral exploration and environmental industries and academia, prior to its adoption.

The Director's office is responsible for the financial operations of the GSNL. Our Administrative Assistant position is currently vacant, but when filled will be responsible for all requisitions, purchasing and payments. Logistical and communications support of field crews are handled by **Gerry Hickey** (Newfoundland) and **Wayne Tuttle** (Labrador). They are also responsible for maintaining all the GSNL field equipment and vehicles. Field-safety training courses, including first aid, ATV, boat and helicopter safety, driver education, and chainsaw training are coordinated by the Administrative Assistant. Gerry Hickey is our certified ATV safety instructor. Wayne Tuttle also carries out quarry inspections in Central Labrador.

Safety in the field is a prime concern of the Geological Survey, and every effort is made to eliminate accidents through training and awareness initiatives. The Geological Survey was once again recognized for its safety record by the AMEBC – PDAC "Safe Day Everyday" Award in 2014.

Regional Geology

The Regional Geology Section (**Alana Hinchey, Senior Geologist**) is responsible for all bedrock mapping in the province. There were two field projects in 2015. Tim van

Nostrand continues mapping in the northeastern Ashuanipi Complex of western Labrador, and Andrea Mills continues mapping in the Bonavista Peninsula area. Bruce Ryan, Charlie Gower, Brian O'Brien, Ian Knight and Doug Boyce focused on data compilation, report writing and office-based studies, with limited fieldwork to investigate specific geological relationships in their map areas. Monica Squires provides assistance to project geologists and is currently focused on a data-management project dealing with the paleontology collection housed at The Rooms Natural History Annex.

Tim van Nostrand continues 1:50 000-scale bedrock mapping of the Archean Ashuanipi Complex in northwestern Labrador, including all or parts of NTS 23J/05–07. The Ashuanipi Complex consists of older, granulite facies metasedimentary and tonalitic to granodioritic gneisses that are intruded by variably deformed diatexite, granite, syenite, diorite and tonalite plutons and subordinate gabbro and pyroxene-rich ultramafic rocks. The region has potential for hosting gold, base metal and platinum group elements in several rock units. Numerous gossan zones containing pyrrhotite \pm arsenopyrite \pm chalcopyrite mineralization, some with elevated values of Au, Ag, Cu, Ni and Cr occur, locally, within migmatitic gneiss, foliated granitoid rocks and mafic and ultramafic intrusions. Limited exploratory work has been carried out on these mineralized zones and the overall economic potential for the region remains untested.



Sampling a gossan zone in migmatitic gneiss, Ashuanipi Complex.

Andrea Mills continues a 1:50 000-scale bedrock mapping project on the Bonavista Peninsula (NTS 2C/6 and 2C/11). This project complements recent regional bedrock mapping on the peninsula and aims to generate an updated regional geological map of the region. The Bonavista Peninsula is underlain by Neoproterozoic siliciclastic rocks of the marine-dominated Connecting Point and Conception groups to the west and east, respectively, and terrestrial-



Possible overturned thrust fault; Fox Island, Bonavista Peninsula.



West-plunging ramp anticline with small leading syncline; Fox Island, Bonavista Peninsula.

dominated Musgravetown Group in the central core of the peninsula. Mapping in 2015 has helped elucidate the nature of deformation affecting the rocks. North-directed, Avalonian thrust tectonics have been recognized in the region for the first time and are overprinted by Acadian transpressive deformation.

Brian O'Brien continues to revise and complete work on the 1:25 000-scale geological maps of the Robert's Arm volcanic belt and adjacent rocks in the region between Halls Bay bottom and the Badger lakes (parts of NTS 12H/01, 08 and 2E/04, 05). The Ordovician rocks disposed in this area were previously highlighted in smaller scale tectonostratigraphic maps that were released online in 2014 at the Geological Survey website in .pdf format. The final systematic maps are designed for release as a three-part digital series. The lithostratigraphical units present on each map are linked to a common legend that has embedded geological notes. Serial cross sections are planned at 1:25 000 horizon-

tal scale and cross referenced to the explanation of map symbols

Ian Knight is studying the Early Carboniferous succession in the Deer Lake Basin prompted by the recent discovery of tetrapod trackways in the Anguille Group near Pasadena by Ken Tuach. The trackways, tentatively identified as *Palaeosauropus* occur in muddy and sandy rocks of a 350 Ma lake. Beside the trackways, a large escape burrow of a possible lungfish, fish-trace marks (*Undichnia*) and arthropod scratch marks are also present. A number of thin mafic, vesicular volcanic flows and tuffs with evidence of scoria and re-sedimentation in the succession were collected for further analysis by Alana Hinchey. Reconnaissance mapping shows the area to be deformed by open to tight, upright to slightly recumbent folds; a cleavage and crenulation fabric is locally present. Knight and Doug Boyce have recently completed an open file on the geology of the Bird Cove area that sketches the area's geological history for visitors to the Bird Cove Museum.

Doug Boyce continued the detailed systematic description of late Early Cambrian (Dyeran) to Middle Cambrian (Delamaran) trilobites from mixed siliciclastic-carbonate facies within the Hawke Bay Formation (Labrador Group) of western Newfoundland. Historically, the formation was interpreted to be an exclusively late Early Cambrian unit, containing only trace fossils, and lacking macrofossils. Middle Cambrian trilobites were first recognized in 1986; these comprise the richest Delamaran faunas in the Appalachian-Caledonian Orogen. Genera and species known from other regions (*i.e.*, southern Canadian Rocky Mountains, the American Great Basin, and Argentina) have been described, as have other new species.

Charles Gower is finalizing his synthesis of the geology of eastern Labrador. Most graduate student research projects addressing the region in which he has been involved are now complete and publications have been delivered or are in preparation.

Bruce Ryan is continuing compiling maps and a report covering his and Don James' work in the Nain area, as well as revising some previously published geological maps and, through consultation with Nunatsiavut government personnel, adding Inuktitut nomenclature for geographic features to all maps, as appropriate. A coloured and revised version of the Nain 1:50 000-scale sheet (NTS 14C/12), along with descriptive notes has been released. He has continued to provide geological guidance to Labrador prospectors in specific areas, to several Labrador archaeologists with respect to prehistoric stone artifacts, and to several Canadian and international researchers regarding the early Archean gneisses of northern Labrador. An invited review of a book on the life of Austrian geologist Eduard Suess appeared in a recent issue of *Geoscience Canada*.

Alana Hinchey continues collaborating with the Geological Survey of Denmark and Greenland (GEUS) on two projects: a) a project in collaboration with Dr. Christen Knudsen that aims to determine the source and provenance of the continental shelf sediments; and b) a project in collaboration with Dr. Peter Japsen that focuses on the uplift history of the province. Other collaborative projects include working with the Department of Business, Tourism, Culture and Rural Development as well as with local partners on a variety of geotourism projects, including the Aspiring Discovery Geopark on the Bonavista Peninsula and the Aspiring Cabox Geopark in the Bay of Islands region. She is also involved with several geoheritage projects such as Mistaken Point Ambassadors, the Fortune Head Geology Center and the Geological Treasures Network of Eastern Newfoundland.



Examining soft sediment deformation, Bonavista Peninsula.

Monica Squires, with the assistance of summer students Dylan Smith and Colin Taylor, has continued processing the substantial paleontology collection housed at The Rooms Natural History Annex. This past year saw the reconfiguration of the facility to considerably improve its archival storage capacity; in 2015 approximately 35 buckets, 10 boxes, and a large quantity of oversized samples of transitional material have been examined, prepared, documented and moved into permanent storage. All fossil material from the Petit Jardin and Berry Head formations have now been processed and archived, as well as about half of the Boat Harbour formation collection. An essential component of this museum work is the new electronic collections management system for The Rooms, which went live in early 2015.

Geochemistry, Geophysics and Terrain Sciences Section

The Geochemistry, Geophysics and Terrain Sciences Section (**Steve Amor, Senior Geologist**) covers a range of geoscience, including aggregate-resource assessments; till-

and lake-sediment geochemical surveys; data-mining; surficial geological and ice-flow mapping; geophysical compilations and interpretation; and environmental geology, specifically coastal erosion studies and geological hazard mapping.

Retirements

The Terrain Sciences section saw the retirement of two long-serving geologists, **Jerry Ricketts** and **John McConnell**, who between them have authored or co-authored more than 400 reports and papers during their time at the Survey. John's most recent work was an open-file report describing multimedia surveys over granitic rocks in southern Newfoundland, while Jerry produced a series of reports on granular-aggregate resources of western Labrador.

Quaternary Geology

Jennifer Organ carried out surficial mapping and sampling of NTS 12 H/02, 03 and 12A/14 in central Newfoundland. Nearly 550 sites were sampled using an ATV and helicopter; an open-file report is expected in 2016. Thick deposits of locally derived glacial diamicton form blankets and hummocky terrain, interspersed by bogs, on the Topsails Plateau, where bedrock outcrops are rare. Outcrops are more common along the western edge of the Long Range Mountains, where eroded meltwater channels carved in the thick diamicton are evidence of copious amounts of meltwater produced during the late stages of deglaciation. Thick glaciolacustrine sands mark the presence of former glacial Lake Howley along the south shore of Grand Lake.

Jennifer was afforded the opportunity to examine a freshly dug trench and backhoe pits at the Moosehead gold prospect near Bishop's Falls, assisted by Robyn Constantine, and also examined and reported on the potential for a landslide near Harbour Breton.

Laboratory Services

The Geochemical Laboratory is located in the Howley Building, Higgins Line, St. John's. As well as handling samples of rock and till collected by survey geologists, **Chris Finch** and his staff, **Ray Roldan**, **Lisa Connors** and **Jennifer Kelly**, have begun analyzing water samples as part of an initiative by the Department of Environment and Conservation to monitor the quality of well-water throughout the island. A pilot study produced multi-element analyses of water samples from more than 200 wells collected by residents of Torbay.

Geological Hazards and Climate Change

In addition to working on an open-file report on her monitoring of coastal erosion over the last five years, **Melanie Irvine** has continued to provide advice to stakeholders and has been familiarizing herself with the use of the UAV (drone) to facilitate her work.



Helicopter Drone.

Melanie also co-chaired a session entitled "Evolution of the coastal zone: recent advances in coastal knowledge" at the 2015 Canadian Quaternary Association conference in St. John's in August, where **Steve Amor** read a paper entitled "Multivariate Analysis of the Composition of Tills from the Burin Peninsula", which is also the subject of an upcoming open-file report. Several other section members were active participants at the conference.

In cooperation with geochemists from the Geological Survey of Canada, Steve also continues to work on the production of integrated geochemical maps of Labrador and the adjacent part of Québec. A batch of samples from the National Geochemical Reconnaissance Program in Labrador is being re-analyzed by methods that will allow better harmonization with the Québec data. He provides advice to prospectors on the effective use of geochemical methods, and taught a fourth-year course in Exploration Geochemistry at Memorial University.



Jennifer measuring striations.

Gerry Kilfoil and **Robyn Constantine** continue to reprocess company data to create high-quality, lucid geophysical maps. A contract airborne gradient magnetic and radiometric survey of NTS 01M/13 took place in early October and results are expected to be released in the first half of 2016.



Robyn extracting a clast for till fabric analysis.

David Taylor continues to coordinate the integration of digital data with the online Geoscience Atlas. Three new 1:50 000 digital surficial geology maps have been added to the Geoscience Atlas bringing the total to 110 for the Island and 38 for Labrador. New striation data collected during the 2015 field season are currently being edited and will be added to the striation dataset. Work on the aggregate resources dataset has been completed and is now available online. Similar updates, to include the most recent data, have been made to the surficial landform dataset. A new initiative has started, in 2015, to scan and rectify approximately 2000 1:15 840 scale digital Peatland inventory maps, for the island, initially commissioned by the Department of Forest Resources and Lands in 1980. To date, these maps are currently only available as transparencies; approximately 750 maps have been scanned and rectified.

Mineral Deposits Section

The Mineral Deposits Section (**John Hinchey, Senior Geologist**) is responsible for the documentation of metallic and non-metallic mineralization, conducting related research studies, and developing assessments of regional mineral potential. The section also plays a role in resource issues related to aboriginal land claims, and protected areas/land use discussions.

Mineral Occurrence Data System (MODS)

The MODS is a detailed database of mineral occurrences that incorporates public-domain information from mineral exploration and Geological Survey research reports. The

MODS is managed by **Greg Stapleton** with the assistance of **Jan Smith** and **Crispin Pike**, a new staff member who is replacing Marina Schofield who left the Geological Survey to pursue graduate studies at the University of Auckland, New Zealand. **Crispin** has a strong background in structural geology and comes to us after a ten-year career in mining and mineral exploration with Inco/Vale where he worked at their Voisey's Bay, Thompson, Sudbury and Brazilian operations.

The MODS is continually updated using available public-domain information. During 2015, numerous NTS map sheets were updated. The MODS is accessible through the survey website and through the Geoscience Atlas. It is a real-time database; new or updated occurrences become available online within 24 hours of input.

The MODS project also contributes to the preparation of mineral commodity series reports. The report on barite was completed and released in 2015, and work on the silica report is well under way. Another project activity is in land-use planning. Mineral Inventory personnel review all provincial government land-use applications and environmental assessment projects with the aim of minimizing the impact of land development on the province's documented mineral resources and areas of high-mineral potential.

Research on Uranium Mineralization

Greg Sparkes continues deposit-level studies on uranium mineralization within the Central Mineral Belt of Labrador. Field work in 2015 included several site visits to known uranium deposits to examine drillcore and conduct limited field mapping of alteration assemblages related to the development of uranium mineralization. As part of this study, a site visit to the Michelin deposit was supported by Paladin Energy, where investigations involved the examination of the spatial distribution of sodic alteration around the deposit in addition to collecting spectral data from drillcore



Field visit with personnel from Aurora Energy.



Field camp at Moran Lake.



Amphibole-rich, magnetite-bearing breccia near the Michelin deposit.

to test if the alteration displays characteristics that can be evaluated using visible/infrared reflectance spectrometry. Field work in the western portion of the Central Mineral Belt involved the follow-up of new geochronological data which provides age constraints on the development of iron-oxide-rich hydrothermal breccias in the Moran Lake area. These results will form the basis of a Current Research report in 2016.

Research on Base-metal Mineralization

John Hinchey commenced a new project working on volcanogenic massive sulphide (VMS) deposits and potential environments in central Newfoundland. Field work in 2015 was conducted in the North Salmon Dam Basalt of the Cold Spring Pond formation and the North Steady Pond Formation of the Baie d'Espoir Group and included examining archived diamond-drill core as well as regional outcrops from both packages of rocks. The Cold Spring Pond formation is dominated by epiclastic sedimentary and mafic volcanic rocks and contains the Great Burnt Lake VMS deposit, the South Pond VMS deposit, and two gold-rich VMS style mineralized zones. The goal of the research is to document the styles of VMS mineralization, to characterize

the host rocks, and to determine the nature and genesis of the gold enrichment in the northern part of the mineralized trend. The North Steady Pond Formation is dominated by volcanoclastic sedimentary and felsic volcanic rocks and hosts the Katie VMS mineral occurrence as well as a number of alteration zones. Although this unit could have similar mineral potential to other volcanic packages in central Newfoundland, there is limited scientific information on this package of rocks. The goal of this research is to examine the mineralization at the Katie occurrence to determine the style, genesis, and age of the mineralization, as well as to examine the mineral potential of the remainder of the formation.

Research on Gold Mineralization

Hamish Sandeman continued work on gold metallogeny and new gold discoveries mainly in central Newfoundland. Field work in 2015 included a two-week excursion to the Beaver Brook Antimony Mine to examine regional outcrops and drillcore, particularly a number of recent drillholes that yielded both antimony and precious metal mineralization. A few days were spent in the Baie Verte area, constituting part of an industry/academia/government collaboration organized by Anaconda Mining's vice president Paul MacNeil. The group included Memorial University staff Steve Piercey, Graham Layne, and their students, contract geologists David Copeland, David Evans and Spencer Vatcher. The intent of this excursion was to collectively share observations and formulate ideas to focus innovative research towards a better understanding of the Ming's Bight geology and origin of the gold deposits of the Ming's Bight and Baie Verte peninsulas. Subsequently, Hamish visited the Twilite Prospect, Pit, Far West, and Tom Joe occurrences in central Newfoundland, as well as to the Browning Mine, Kramer, West Corner Brook and Jacksons Arm showings near White Bay. During the latter part of the summer, Hamish examined drillcore stored at Buchans and Pasadena and spent a few days examining a newly excavated trench at the Moosehead prospect. Laboratory work continues to include U–Pb and Ar–Ar geochronology, petrography, lithogeochemistry, image



Pine Cove visit, 2015.



West Corner Brook adit.

analysis using SEM/MLA (scanning electron microscope/mineral laser ablation) methods and electron microprobe analysis. The plans for publication in 2016 include a Current Research article on geochronological and geochemical studies of the Sops Arm Group. There was no field work on epithermal-style gold mineralization in eastern Newfoundland in 2015, although Greg Sparkes continues to be involved in an ongoing student research project by Sarah Ferguson at Memorial University.

Research on Iron ore Deposits

Research work related to iron ore deposits in western Labrador continued in 2015 under the direction of **James Conliffe**. Field-work was limited to a short field visit to Schefferville to collect samples from Tata Steel Minerals Canada's newly opened pits in the Kivivic area. Laboratory work included oxygen isotope analyses and litho-geochemistry from selected high-grade iron ore deposits in the areas east of Schefferville on the Québec-Labrador border, as well as geochemical and petrographic studies of iron ore deposits in the Labrador West area. This work is currently being compiled for future Open File reports and Current Research articles. In addition, a collaborative research project with geologists from Curtin University, Western Australia began in 2015, which aims to look at the diagenetic history of iron formations in western Labrador and the iron ore deposits of Bell Island, with more fieldwork planned for 2016. James is also contributing to a collaborative research project on Fe-Ti-V magmatic oxide mineralization in anorthosite suites, with Memorial University (Labrador Institute).

Geoscience Data Management Section

The Geoscience Data Management Section is responsible for the organization, management, integration and distribution of the geoscience information collected by the Geological Survey. As the size and number of geoscience datasets have grown, it is important that digital techniques are used to manage this information and apply it effectively



Tata Steel Minerals, Canada.

to mineral exploration. Significant changes in digital information and communications technology over the past decade, are completely transforming the way in which geological surveys throughout the world manage and disseminate their geoscience knowledge. In response to these changes and client needs, the section has focused on database management techniques and internet tools for the consistent and timely delivery of geoscience information to government scientists and industry clients.

The section is headed by **Senior Geologist Larry Nolan**. **Loretta Crisby-Whittle** is responsible for the bedrock-geology database for the province. The Geoscience Atlas, on-line delivery of geoscience information, on-line data standards and integration are coordinated by **Pauline Honarvar**. **Shawn Duquet** provides support to all projects as well as to various projects in other sections of the Survey.

The digital bedrock geology dataset for the island portion of the province is complete and available for download from the Geoscience Atlas and work is under way to provide customized legends. The dataset incorporates information from the most detailed bedrock geology maps for the province and applies a series of common legends. Full legends and colour layers are available for download but eventually the user will be able to produce area specific legends. Updates will be made to the bedrock geology map theme layer on the

Geoscience Atlas as newly published maps are released. Images of the original published bedrock geology maps for the province are available for download in Portable Document Format (.pdf) from the Survey Website Map Index page.

The web-based Geoscience Atlas (<http://gis.geosurv.gov.nl.ca/>) was upgraded to a new platform last year and continues to be improved. Many layers, such as the Index of Geochemical Surveys, the Detailed Surficial Geology and many of the layers in the Land Use group, have been updated. New layers, such as the Geochemistry of Regional Stream Sediments from northern Labrador, have been added. Other layers, such as the Geochemistry of Detailed Stream Sediments in both Newfoundland and Labrador, will be added in the near future. In the Search Results window, more 'Links' will be available to associated pdf reports and databases. The Atlas Tutorial .pdf slide show, linked through the Atlas Help file, provides an overview of the Atlas layers and tools.

Geoscience Publications and Information Section

Publications and Cartographic Services

Publications and cartography includes editorial (**Chris Pereira** and **Des Walsh**), cartographic/GIS (**Dave Leonard**, **Kim Morgan**, **Terry Sears** and **Neil Stapleton**), and desktop publishing and design staff (**Joanne Rooney** and **Bev Strickland**). They are responsible for report and map preparation and production for the GSNL, and provide cartographic, graphic design and desktop publishing services to other divisions and branches of the department, as needed.

In the past year, the section published in excess of 40 maps, final project reports, open file releases, and other documents including the annual Current Research volume. It also assisted in production of joint GSNL–GSC open file releases of geophysical data collected under the GEM and TGI-4 programs. Staff provided graphic design and related cartographic support for trade magazines, a wide variety of branch presentations, for promotions and investment initiatives at mining trade shows, conferences and symposia, and for the outreach projects. Updates of the Mines Branch area of the website and the web-based release (timed and otherwise) of all GSNL publications are also handled by this group.

Promotion, Geoscience Marketing and Investment Attraction

This group has overall responsibility, within the Mines Branch, for a wide array of promotion and investment attraction initiatives designed to encourage growth in the mining and mineral-exploration sectors. The Mines Branch promotion program is the responsibility of **Carolina**

Valverde Cardenas, **Sean O'Brien** and **Phil Saunders**.

The group provides technical information on current exploration activity, geological context of exploration trends, opportunities for new project generation, and information on Mines Branch programs to support the industry. The group's mineral promotion initiatives in emerging markets also include information on Canadian business culture and best practices within the mining and exploration sectors.

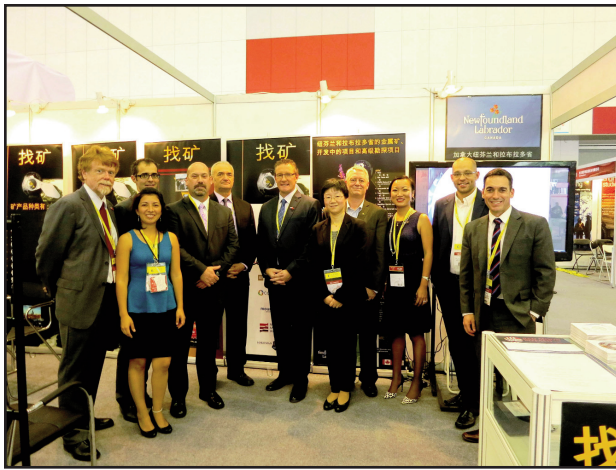
The group organized and delivered promotional initiatives at Mineral Exploration Roundup, PDAC, Québec Exploration, and Xplor /Congres de L'Exploration du Québec, as well as at local venues such as Mineral Resources Review, and the Northern Exposure conference. The group expanded its collaboration with the International Business Development and Sector Development divisions of the Department of Business, Tourism, Culture and Rural Development (BTCRD), and continued efforts to promote opportunities in the mining supply sector. In addition, a new Mines Branch promotions pavilion was introduced at PDAC and Exploration Roundup. In both these venues, the promotions group collaborated with Mining Industry NL and assisted Newfoundland and Labrador prospectors and junior company representatives in attendance. Throughout the year, staff developed and updated a wide array of technical promotions materials, many of which are also available in Mandarin and French.



Exploration Roundup.

The group was joined by Minister Dalley at Canada–China mineral forums and related events in Beijing, Shanghai and Toronto, and at the China Mining Congress and Expo in Tianjin. The promotions team was presented with the Best Contribution Award at China Mining 2014 and, for the first time, participated in the Exploration Exchange China Conference and Exhibition in Beijing.

Web-based promotional initiatives continue to target both traditional and emerging markets. The 'Explore



Exploration Exchange China Conference and Exhibition, Beijing.

Newfoundland and Labrador' and the 'Asian Investment Initiatives' areas of the website (available in both English and Mandarin) were updated and expanded to encourage and facilitate industry participation in this area.

Industry Information and Client Services (Mineral Exploration Consultant)

The Mineral Exploration Consultant's office (**Phil Saunders, Stephanie Neary**) represents the initial point of contact for most clients of the GSNL, and for the Mines Branch in general. It provides information and consultation services to a broad client base including companies, prospectors, industry associations, other government departments and agencies (both federal and provincial) and the general public. The group has a close working partnership with the Matty Mitchell Prospectors Resource Room (see below) and with Geofiles staff. It collectively handles a large volume of requests for information, help and advice made through office visits, phone calls and emails.

As Mineral Exploration Consultant, Phil Saunders provides independent advice and information to clients relating to mineral exploration. He maintains a key role as industry liaison, tracks exploration trends and activities in support of promotional activities, and provides strategic advice to clients.

In 2015, as part of an educational initiative, Phil created a new mineral deposit exhibit for prospectors on the first floor of the Natural Resources Building. The intent of the exhibit is to illustrate mineralizing environments in Newfoundland and Labrador through the use of technical posters, supplemented by selected samples from our mines and prospects. Phil also helped reorganize and update a new section of the Matty Mitchell website called "Educational Tools for Prospectors". As part of the Promotions Group, he authored or co-authored articles on mining and exploration activity in the Province, for publication in the

Canadian Mining Journal. He also helped prepare and deliver various presentations to potential investors visiting the Mines Branch.

Geoscience Documents Collections and Databases

The Geofiles and Library collections, with related metadata, are maintained by staff of the Geoscience Publications and Information Section (**Cindy Saunders, Paula Bowdridge and Desiree King**).

The Geofiles collection is a growing, digital and hard copy collection of private- and public-sector mineral exploration and geotechnical/geoscientific documents (currently 23 000+ items) relating to the province. Many of these documents are exclusive to this collection. Metadata describing the Geofiles are searchable online at <http://gis.geosurv.gov.nl.ca/minesen/geofiles/>.

The Geofiles collection includes over 11 000 non-confidential mineral exploration assessment reports. About 96% of these are now available online in .pdf format. The Mines Branch is now receiving and archiving most assessment files in digital-only format. The Geofiles collection also includes Geological Survey (and predecessor organizations) publications dating from 1873 to the present. Metadata for these 5000+ documents (including articles in volumes such as Current Research) are searchable online. About 46% of these documents are also available online as .pdfs.

In late 2014, a large number of maps from government documents and assessment files were scanned by an external contractor. Summer students scanned a quantity of older assessment files that were not yet online. Government web-use statistics indicate that between October 2013 and October 2014, 236 212 pdfs were downloaded and there were 36 496 Geofiles metadata queries. Geofiles staff provide customized searches of the Geofiles, Library, Pfiles and various in-house databases, and also assist clients (in-house and by phone) doing their own online searching.

Matty Mitchell Prospectors Resource Room

The Matty Mitchell Prospectors Resource Room is a private-public partnership with funding and in-kind support provided by the Mines Branch and Mining Industry NL. The project is overseen by a joint government-industry committee chaired by Sean O'Brien. Resource Room Geologist, **Pat O'Neill**, is responsible for the daily operation of the project.

Although the downturn in the mining industry continues to have a negative trickle-down effect on the prospecting industry in Newfoundland and Labrador, some prospector properties were successfully optioned. Local prospectors continued to avail of the support and mentoring services offered by the Resource Room during 2015. Varying levels

of technical support were provided that helped in the discovery, promotion and advancement of their mineral properties.

The Resource Room played a major role in assisting prospectors at Mineral Resources Review (St. John's), Mineral Exploration Roundup (Vancouver) and PDAC (Toronto). Informative property posters were compiled to help prospectors promote their properties at these events. A booklet, maps and flash drives containing information on "Properties Available for Option in Newfoundland and Labrador" were updated several times during the year and .pdf versions of these properties are available on the Matty Mitchell website at:

www.nr.gov.nl.ca/nr/mines/pro prospector/matty_mitchell/index.html

The Resource Room website was updated throughout the year, and most notably, a new "Educational Tools for Prospectors" section was launched.

In 2015, the Resource Room geologist attended the fourth Annual General Meeting of the Newfoundland and Labrador Prospectors Association (NLPA) in Grand Falls / Windsor with a display of promotional material, literature and rock samples.

The Resource Room continues in its collaboration with the Mineral Incentive Program, whereby prospectors without grants can avail of funding to have promising mineralized samples assayed free of charge. This service includes rock and mineral identification, and informal discussions about the geology and mineral potential of the particular area of interest. As in previous years, this arrangement has resulted in new mineral discoveries and subsequent claim staking.

MINERAL DEVELOPMENT DIVISION

The Mineral Development Division administers the *Mining Act* and is responsible for the approval of plans for the development, operation and closure of mines; development of mineral policy; monitoring and economic analysis of the mining industry; management of financial incentive programs for exploration; and management of orphaned and abandoned mines. This is the key division for liaison with other federal and provincial government departments on mining matters. **Alex Smith** is the director of the division.

Operations

The division is responsible for administering the *Mining Act*, ensuring that mineral resources are responsibly developed and that end-of-life operations are properly closed and monitored. It is responsible for rehabilitating legacy orphaned and abandoned mines to ensure they do not present safety hazards.

The division encourages the development of the province's mineral resources by providing training and financial assistance to prospectors and junior exploration companies under the Mineral Incentive Program. It monitors provincial, national and world-wide trends in the industry and provides advice to provincial and federal government agencies that support or assist mining projects.

The division's activities are organized into three sections by major work functions: Engineering Analysis, Mineral Industry Analysis and the Mineral Incentive Program.

Engineering Analysis

The Engineering Analysis Section is responsible for administration of the *Mining Act*. Development plans and rehabilitation and closure plans are submitted and are reviewed for compliance with this legislation. Financial assurance in amounts sufficient to ensure full rehabilitation for each mine site is required from the operator(s) and administered by the Section. The *Mining Act* also requires mine operations to submit an annual report on the past year's operations, and an operational plan for the coming year. Through review of these annual submissions and inspection of the mine sites, Engineering Analysis staff ensures that operators are developing projects according to approved development plans, and, at the end of mine life, that projects are properly rehabilitated.

Engineering Analysis manages the orphaned and abandoned mines in the province and continues to monitor conditions at these sites.

The Engineering Analysis Section has seven staff positions including the manager, four mineral development engineers, a geologist and a financial officer.

Mineral Industry Analysis

The Mineral Industry Analysis Section maintains an ongoing program of research and statistical tracking of provincial and global mineral industries to provide data that directs policy and program development. Global market trends, events, supply/demand, *etc.* are analyzed for their impact on existing, developing and potential mineral projects within Newfoundland and Labrador.

The section compiles a semi-annual forecast of mineral shipments and employment via a direct survey of the individual mining operators within the province. Forecasted data and property updates are provided to the Department of Finance as part of the provincial budgetary process. Mineral Industry Analysis works with Finance to provide information and analysis on mining related issues and projects to determine provincial impacts.

The mineral statistics database of shipments and employment is a responsibility of the section. Statistics obtained are reviewed and compared to mineral industry census data obtained by Natural Resources Canada. Through an ongoing process of communication, data gaps and discrepancies are resolved to maximize statistical integrity.

Mineral Industry Analysis provides data and analysis to departmental executive for use in the development of policy and regulation of the provincial mining industry. The section prepares regular reports such as a daily commodity price list and weekly fact sheet in addition to issue specific briefing notes. Mining regulatory filings with provincial and federal departments as well as security exchanges are reviewed and analyzed. This is completed for projects operating provincially as well as those globally that potentially impact local project feasibility and industry policy.

The section liaises with the public providing information on existing mining operations in the province. Semi-annual 'Mining in Newfoundland and Labrador' and annual 'Minfo' publications are produced and distributed at conferences and via an email distribution list. These are also published on the department's website along with other industry information maintained by the section. Section staff maintain positions on several industry committees to both collect and disseminate industry information.

The Mineral Analysis Section has six staff positions including the manager, four industry analysts and a clerk typist.

Mineral Incentive Program

The overall budget for the Mineral Incentive Program (MIP) is \$1.6 million for 2015-16. The table below summarizes the spending by program from 2012-13 to the present.

Program	2013-14	2014-15	2015-16 (projected)
Prospector Assistance			
Grants approved	53	62	67
Amount	\$227 667	\$265,278	\$313,547
Junior Exploration			
Number of grants	17	18	18
Amount	\$1 484 000	\$1 388 908	\$1 144 000
Prospector Training			
Course Number	1	1	0

The number of prospector grant applications is up slightly so far in 2015 and the total final expenditures by the prospecting community are expected to remain relatively constant. MIP continues to support prospector promotion through its annual \$40 000 grant to Mining Industry NL to

help fund the Matty Mitchell Prospector Resource Room, and grants for prospector travel to national conferences.

The annual two-week prospector training course was advertised for September of 2015. The course's timing was changed from May to September in response to feedback received during prospecting information sessions conducted by Natural Resources, but was cancelled this year because of the small number of registrants.

For 2015-16, the Junior Exploration Program has been changed from an application-based program to a rebate program to allow more flexibility to exploration companies, make the program more accessible and eliminate the problem of committed funds not being completely spent and returned to the program at fiscal year-end. The application has been replaced with a letter of intent. Funding will be proportionately dispersed up to the maximum allowable grant amounts to all eligible exploration programs that have submitted a letter of intent and submit appropriate technical/financial reports within the allowable timeframe.

It is anticipated that field visits to prospector and junior exploration company work sites will be the focus for the autumn. Review of final reports from grant recipients and arrangement of final grant payments will take the section through the end of the fiscal year.

The Mineral Incentive Program has three staff positions including the manager, a geologist and a clerk typist.

Julienne Lake Deposit

The Julienne Lake deposit was made an Exempt Mineral Land (EML - meaning that the mineral rights are reserved for the Crown) in 1975. In 2009, government recognized the potential value of the deposit and initiated a multi-phase exploration program to improve understanding of the deposit and assist in its development. Mineral Development administered this process.

As a result of a previous request for proposals, government is negotiating with the Julienne Lake Alliance to potentially develop the Julienne Lake deposit. A successful conclusion to negotiations would be followed by a prefeasibility study on the project.

The division continues to provide support to the government's negotiation team with technical advice, market research and economic analysis.

Staffing

Tony Burgess, Manager of the Mineral Industry Analysis Section, retired in March; Lew Higdon, Mineral Industry Analyst retired in May; and Len Mandville, Manager of Engineering Analysis, retired in August. The Division con-

tinues to adjust to this significant loss of experience, corporate knowledge and character.

The process for filling these positions is ongoing.

MINERAL LANDS DIVISION

The Mineral Lands Division is responsible for the regulatory functions and information services that facilitate the orderly discovery and development of the province's mineral resources. These include administration and management of mineral rights and quarry rights, permitting of exploration for minerals and quarry materials, retrieval and storage of core from exploration drill sites, and monitoring the types and amount of exploration activity in the province. The division has extensive contact with other departments and levels of government through its involvement in various review processes and application referrals, and represents the Mines Branch on the Interdepartmental Land Use Committee. The Director of the Mineral Lands Division is **Kevin Sheppard**.

Staff Changes

There have been two staff changes in the Mineral Lands Division this year. **Trina Adams** was appointed Assessment Report Review Geologist in November 2014. Jim Hinchey retired as Director of the division in October 2015. **Kevin Sheppard** was appointed as the new Director of Mineral Lands in October 2015.

Mineral Rights

The Mineral Rights Section (**Justin Lake, Laurie Hennessey, Stephen Hinchey, Trina Adams, Charles Newhook, and Brenda Lynch**) administers all aspects of the acquisition, maintenance and regulation of mineral rights in the province. Many of these functions are performed through the Mineral Rights Administration System (MIRIAD). MIRIAD provides real-time, online, map-based claim staking, and integrates mineral rights information with the province's geographic information and financial management systems.

Mineral rights are also managed through several hardcopy registries that record transfers, confidential agreements, mineral licenses issued, and mining and surface leases, that together comprise over fifty volumes of documents. These documents are used extensively by the legal community and the exploration and mining industry generally. Work continues on a project to digitize all of these records and make them available to the general public via a web-based application.

The Historical Mineral Tenure Project continued in 2015, with digital files being created for all historical concession lands. It is anticipated that these files, along with previously created files of all historic fee simple mining grants, will be made available through the online Geoscience Atlas in 2016.

The Mineral Rights Section also monitors exploration activity and expenditures in the province. Expenditures are surveyed semi-annually by Natural Resources Canada and the survey results shared with the province. The results are analyzed internally and aggregate results are reported to various branches of government and cited in publications.

The Mineral Rights Section is also responsible for the review of municipal plans and various land-use proposals to ensure that these do not have a negative impact on the mineral and aggregate resource industries of the province.

Quarry Materials Section

The Quarry Materials Section (**Gerald Kennedy, Ges Nunn, Joanne Janes, Andrea Devereaux, Kirby Way and William Oldford**) is responsible for the administration and enforcement of the *Quarry Materials Act, 1998*, and associated regulations.

From April 2014 to March 2015, 1937 quarry permits were issued out of 2107 applied for. Total production of quarry materials in the same time period was 1 769 534 cubic metres. Regional inspection staff completed 1584 inspections of quarry sites and issued 21 stop-work orders thus far in 2015 (to October 8).

Development of a new Quarry Management System (QMS) continued in 2015. The new QMS will consist of three components: a public facing component providing for the online acquisition and renewal of quarry permits and quarry material exploration licenses and payment of required fees, an internal maintenance component, and an offline inspection component.

Core-Storage Program

The Core-storage Program (**Glen Penney and Chris Moran**) is responsible for six core-storage libraries located throughout the province. The core libraries house more than 1.29 million metres of drillcore samples from 9588 drillholes collected from various exploration projects located within the province. Samples are available for inspection and are used extensively by the mineral exploration industry. Sampling of core is permitted where sufficient core is available to allow removal of some material and with the proviso that all unused material is returned to the core library along with copies of analytical results.

There have been 31 visits to the core libraries thus far in 2015 (to October 8). Visitors to the core libraries utilized



Stag Horn Core Collection, 2015.

262 man days to view 82 316 m of drillcore from 521 drill-holes. In addition to client services, core storage staff have completed various maintenance activities (e.g., core collection, re-boxing, cataloguing) on 10 513 m of drill core from 70 drillholes.

The core-storage database is available on-line via the GeoScience Atlas.

Exploration Approvals

All exploration work requires an ‘exploration approval’ and this involves a referral process whereby certain government and non-government agencies must be notified of work intent and are given the opportunity to provide feedback.

Heather Rafuse administers the exploration approvals process and, to date, there have been 260 applications processed in 2015, compared to a total of 234 by year-end in 2014.

Exploration site inspections are conducted on a full-time basis and companies are advised to be diligent in following all regulations and conditions governing their exploration approvals. Exploration Site Inspector **Matthew Snow** completed on-site inspection of 48 exploration project sites by mid-September with inspections ongoing into the fall.

GEOLOGICAL SURVEY DIVISION

Director's Office

Martin Batterson	Director	729-3419	martinbatterson@gov.nl.ca
Wayne Tuttle	Administrative Assistant	896-5162	waynetuttle@gov.nl.ca
Vacant	Administrative Officer	729-7715	
Gerry Hickey	Administrative Assistant	729-2174	gerryhickey@gov.nl.ca

Regional Geology Section

Alana Hinchey	Section Head	729-7725	alanahinchey@gov.nl.ca
Ian Knight	Project Geologist	729-4119	ianknight@gov.nl.ca
Brian O'Brien	Project Geologist	729-3994	brianobrien@gov.nl.ca
Doug Boyce	Project Geologist	729-2163	dougboyce@gov.nl.ca
Charlie Gower	Project Geologist	729-2118	cgower@gov.nl.ca
Bruce Ryan	Project Geologist	729-2111	bruceryan@gov.nl.ca
Tim van Nostrand	Project Geologist	729-4311	timvannostrand@gov.nl.ca
Andrea Mills	Project Geologist	729-1733	andreamills@gov.nl.ca
Monica Squires	Geologist	729-6090	monicasquires@gov.nl.ca

Geochemistry, Geophysics & Terrain Sciences Section

Stephen Amor	Section Head	729-1161	stephenamor@gov.nl.ca
Chris Finch	Director-Geochemical Laboratory	729-3312	chrisfinch@gov.nl.ca
Dave Taylor	Project Geologist	729-5624	davetaylor@gov.nl.ca
Jennifer Organ	Project Geologist	729-1664	jenniferorgan@gov.nl.ca
Denise Brushett	Project Geologist	729-3640	denisebrushett@gov.nl.ca
Melanie Irvine	Project Geologist	729-3489	melanieirvine@gov.nl.ca
Gerald Kilfoil	Project Geophysicist	729-2169	gerrykilfoil@gov.nl.ca
Vacant	Project Geologist		
Robyn Constantine	Geophysicist	729-7445	robynconstantine@gov.nl.ca
Rosaurol Roldan	Chemist	729-3352	rosauroroldan@gov.nl.ca
Jennifer Kelly	Chemist	729-3375	jenniferkelly@gov.nl.ca
Lisa Connors	Chemist	729-3322	lisaconnors@gov.nl.ca

Geoscience Data Management Section

Larry Nolan	Section Head	729-2168	larrynolan@gov.nl.ca
Loretta Crisby-Whittle	Project Geologist	729-2166	lorettacrisbywhittle@gov.nl.ca
Pauline Honarvar	Project Geologist	729-2301	paulinehonarvar@gov.nl.ca
Shawn Duquet	Project Geologist	729-1667	shawnduquet@gov.nl.ca
Gillian Roberts	Project Geologist	729-7727	gillianroberts@gov.nl.ca

Mineral Deposits Section

John Hinchey	Section Head	729-7976	johnhinchey@gov.nl.ca
Greg Sparkes	Project Geologist	729-7290	gregsparkes@gov.nl.ca
Hamish Sandeman	Project Geologist	729-1980	hamishsandeman@gov.nl.ca
Greg Stapleton	Project Geologist, Mineral Inventory	729-6071	gregstapleton@gov.nl.ca
James Conliffe	Project Geologist	729-4014	jamesconliffe@gov.nl.ca
Vacant	Project Geologist		
Jan Smith	Mineral Inventory Geologist	729-6059	jansmith@gov.nl.ca
Crispin Pike	Mineral Inventory Geologist	729-7447	crispinpike@gov.nl.ca

Geoscience Publications & Information Section

Sean O'Brien	Section Head	729-2775	seanobrien@gov.nl.ca
Phil Saunders	Mineral Exploration Consultant	729-6193	philsaunders@gov.nl.ca
Stephanie Neary	Clerk	729-2452	stephanieneary@gov.nl.ca
Cindy Saunders	Geofiles Project Geologist	729-6280	cindysaunders@gov.nl.ca
Desirée King	Clerk	729-2180	desireeking@gov.nl.ca
Paula Bowdridge	Clerk	729-1311	paulabowdridge@gov.nl.ca
Christopher Pereira	Editor	729-6593	chrispereira@gov.nl.ca
Bev Strickland	Graphic Artist	729-2750	bevstrickland@gov.nl.ca
Joanne Rooney	Graphic Artist	729-2769	joannerooney@gov.nl.ca
Carolina Valverde Cardenas	Promotions Geologist	729-6651	cvalverdecardenas@gov.nl.ca
Kim Morgan	GIS Analyst	729-2265	kimmorgan@gov.nl.ca
Dave Leonard	Cartographer	729-2324	daveleonard@gov.nl.ca
Terry Sears	Cartographer	729-2957	terrysears@gov.nl.ca
Neil Stapleton	Cartographer	729-6989	neilstapleton@gov.nl.ca
Des Walsh	Geoscience Copy Editor	729-6441	deswalsh@gov.nl.ca
Vacant	Geologist I	729-6928	

2015 PROJECTS

NEWFOUNDLAND & LABRADOR

