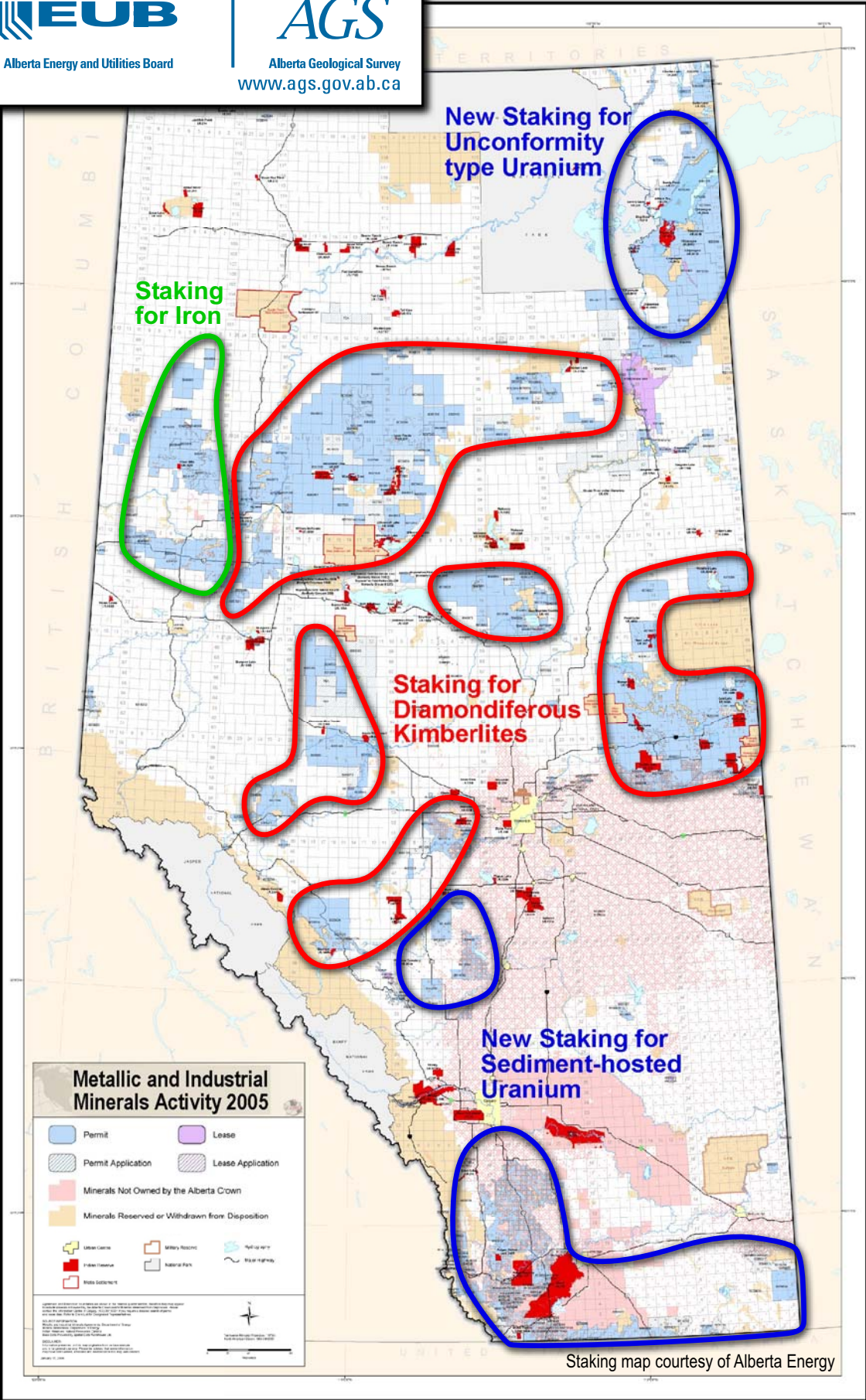


Alberta 2005 Exploration Overview



SELECTED ALBERTA GEOLOGICAL SURVEY & ADOE CONTACTS FOR ADDITIONAL INFORMATION ABOUT MINERALS & COAL WITHIN ALBERTA

Information Item	Contact	Telephone	Email
AGS Publication Sales	Sarah Boisvert, AGS	780-422-1927	Sarah.boisvert@gov.ab.ca
Alberta Department of Energy (ADOE) links: (a) Web page that links to Acts, Regulations and Guidelines for mineral exploration in Alberta (b) Interactive map that shows current metallic and industrial minerals dispositions in Alberta (c) Web page that provides information about coal and coal dispositions in Alberta	Anna Maslowski Acting Director, Mineral Agreements, ADOE	780-415-0349	Anna.maslowski@gov.ab.ca http://www.energy.gov.ab.ca/1219.asp http://www.energy.gov.ab.ca/2741.asp http://www.energy.gov.ab.ca/377.asp
Alberta Kimberlites	Roy Eccles, AGS	780-427-2671	Roy.eccles@gov.ab.ca
Uranium and other metals in basement rocks in northeastern Alberta	Dinu Pana, AGS	780-427-2850	Dinu.pana@gov.ab.ca
Sediment-hosted Uranium in southern Alberta	Reg Olson, AGS	780-427-1741	Reg.olson@gov.ab.ca
Industrial Minerals within Alberta	Dixon Edwards, AGS	780-427-1516	Dixon.edwards@gov.ab.ca
Iron resources in northwestern Alberta	Reg Olson, AGS	780-427-1741	Reg.olson@gov.ab.ca
Structural Compilation of Faults/Lineaments in the Surface/Subsurface of Alberta	Dinu Pana, AGS	780-427-2850	Dinu.pana@gov.ab.ca
Satellite imagery within Alberta available from the AGS	Shilong Mei, AGS	780-422-2454	Shilong.mei@gov.ab.ca
Coal within Alberta	Andrew Beaton, AGS	780-427-3272	Andrew.beaton@gov.ab.ca
Regional Geochemical Surveys within Alberta	Glen Prior, AGS	780-422-0854	Glen.prior@gov.ab.ca

For further information about the Alberta Geological Survey, see our web page: <http://www.ags.gov.ab.ca>

For further information about the ADOE, see their web page: <http://www.energy.gov.ab.ca/com/default.htm>

SUMMARY OF MINERAL EXPLORATION AND COAL ACTIVITY IN ALBERTA DURING 2005

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During 2005, there were 573 mineral permit applications accepted and as a result about 5.2 million hectares (~12,849,020 acres) were staked for minerals within Alberta (Table 1). Exploration activity was up slightly in 2005 relative to 2004, during which year there were 533 permit applications for about 4.7 million hectares staked within Alberta. As of December 31, 2005, there were 1,333 mineral permits in good standing encompassing over 9.9 million hectares where mineral exploration rights had been granted within Alberta. In contrast, at end 2004 there were 866 mineral permits encompassing about 6.3 million hectares of land in good standing.

With respect to the primary commodities being explored for, about two-thirds of the hectares staked in 2005 was believed to be aimed at uranium targets, with the majority of the remaining one-third of the lands staked being in the pursuit of diamondiferous kimberlites. As well, there were a few mineral claims staked for base metals, gold and iron.

Information about the geology of Alberta can be found on the Alberta Geological Survey's (AGS) web site at <http://www.ags.gov.ab.ca>. Information about the current mineral claim activity in Alberta can be found at the Alberta Department of Energy's (ADOE) interactive map at web site <http://www.energy.gov.ab.ca/com/RLA/Maps/Metallic+and+Industrial+Minerals+Activity+Maps.htm>.

Diamondiferous Kimberlites

With the success of diamond projects in Saskatchewan, Ontario and Quebec, it was only a matter of time before diamond companies gained interest in acquiring properties south of Latitude 60°. This also is true for Alberta where during 2005 about 1.73 million hectares (~4.3 million acres) were staked by both junior and major diamond companies. This staking illustrates a renewed awareness in the potential for economic diamondiferous kimberlites to exist within Alberta. This new staking was focused not only in areas of known kimberlite occurrences (e.g., the Mountain Lake, Buffalo Head Hills and Birch Mountains kimberlite fields), but also in several under-explored areas such as along the foothill region of the Rocky Mountains (e.g., near Brazeau River, Blackstone River, Rocky Mountain House), and the Swan Hills, Calling Lake and St. Paul to Cold Lake regions of north-central to northeastern Alberta.

Perhaps the most notable company to newly enter the Alberta diamond exploration scene is Diamondex Resources Ltd. (<http://www.diamondex.net/s/home.asp>) who recently staked 120 metallic mineral permits totalling approximately 2.5 million acres in the St. Paul to Cold Lake area, about 185 km northeast of Edmonton. The property, which is referred to as the Pegasus project, was acquired on the basis of kimberlite indicator minerals (including significant concentrations of G10 pyrope garnet, chromite, diopside and ilmenite), as well as interpreted geophysical targets. Diamondex stated they plan to spend about \$500,000 on their new play, including a limited drill program. Other companies staking either adjacent to Diamondex or north of the Cold Lake Air Weapons Range, include Marmac Mines Ltd. and Sandswamp Exploration Ltd.

Note: Alberta Geological Survey staff is responsible for preparation of the 2005 Exploration Overview, assisted by Alberta Department of Energy staff. For further information, contact Dr. Reg Olson at (780) 427-1741 or by email at reg.olson@gov.ab.ca.

Whereas new staking may produce exciting future discoveries of diamondiferous kimberlite, the heart of the current Alberta diamond play remains in the Buffalo Hills region, which is approximately 400 km north of Edmonton. In the Buffalo Head Hills Ashton Mining of Canada Inc. (<http://www.ashton.ca>), and its joint venture partners EnCana Corporation and Pure Gold Minerals Inc., have thus far discovered 38 occurrences of kimberlite, 26 of which are diamondiferous. Ten tonne mini-bulk samples have been collected from five of these kimberlite bodies (K6, K11, K14, K91 and K252), with three pipes (K14, K91 and K252) having diamond contents greater than 10 carats per hundred tonnes (cpht). Two of these kimberlites (K14 and K91) have an estimated diamond content of 12 and 13 cpht, respectively, are both approximately five hectares in diameter and are exposed at surface or subcrop under shallow till. The near surface dimensions of these pipes raises the possibility that a marginal-grade pipe with aerially extensive surface dimensions might in future produce a diamond mine in Alberta. As a result, the search for an economic diamond deposit has not diminished, especially with Ashton's best results to date coming from a preliminary mini-bulk (22.8 t) sample from kimberlite K252 that contains an estimated diamond content of 55 cpht, with one particular breccia lithology having an estimated grade of 85 cpht. Because of the deep overburden (70-75 m) and relatively small size (<2 ha) of this pipe, the results to date for K252 indicate that this body is unlikely to be economic. During fall 2005, Ashton drilled three geophysical targets, each of which had electromagnetic and gravity signatures approximately 500 metres in width, but they reported they did not intersect kimberlite.

Grizzly Diamonds Ltd. (<http://www.grizzlydiamonds.com/s/Home.asp>) also has a large land package in the Buffalo Head Hills and recently completed airborne magnetic and ground magnetic and electromagnetic surveys on their Smoky the Bear and White Bear properties. On November 21, 2005 they announced the discovery of "*two kimberlite boulders on the Smokey the Bear Property in the Buffalo Head Hills area of Alberta. The kimberlite was discovered within quaternary till and gravel deposits which are exposed within the property, while ground crews were prospecting and sampling*"¹. On January 9, 2006 Grizzly Diamonds announced a budget of \$1.5 Million has been approved for their winter 2005-2006 diamond exploration programs in northern Alberta.

Prospecting for diamondiferous kimberlites continues in or has been recently initiated in several other parts of Alberta. For example, several companies continue to explore for kimberlites in the Birch Mountains area in northeastern Alberta, including Blue Diamond Mining Corp. (<http://www.bluediamondmining.com/>), Dahrouge Geological Consulting Ltd. (<http://www.economicgeology.com/dahrouge/dgcl.htm>), Sandswamp Exploration Ltd. (<http://sandswamp.com/>) and Geolink Exploration Ltd. In the past, eight kimberlites have been discovered in the Birch Mountains area, but all are either non-diamondiferous or only weakly diamondiferous. Recently, there are indications of future drill testing of the Lammasu, Argonaut and Hippogriff geophysical targets in the Birch Mountains. The Calling Lake area in north-central Alberta, which has abundant kimberlite-indicator mineral grains with favourable chemistries, also continues to attract exploration companies; this includes Grizzly Diamonds Ltd., Buffalo Gold Ltd. (<http://www.buffalogold.ca>), Halmco Inc., Pan Ventures Ltd. and various independent prospectors. The Whitecourt to Swan Hills area of northwestern Alberta is another new area of interest for kimberlites and mineral permits have been acquired by Re-creative Developments Ltd., various numbered companies and a few independent prospectors. Finally, several prospectors have staked claims southwest of Edmonton, and in the Hinton and Cardinal River areas within the Foothills. As yet, however, few exploration results have been reported at these newly active areas of diamondiferous kimberlite exploration within Alberta.

¹ **Note** that the quotes from each company reported on herein are taken directly from their public documents, websites or press releases therein. However, the EUB/AGS makes no warranty with respect to the accuracy of any such company statements with regard to their exploration results or activities within Alberta.

Energy Minerals (Uranium, Thorium)

Due to the five-fold increase in the spot market price of uranium over the past four years (i.e., from \$7.23US/pound U₃O₈ in January 2001 to \$36.50US/lb U₃O₈ in early January 2006; see Cameco website at http://www.cameco.com/investor_relations/ux_history/complete_history.php), there has been renewed interest in uranium exploration in Canada after over a 20 year lull in most jurisdictions, except perhaps Saskatchewan. As a result, there has been increased staking for uranium within Alberta during the latter part of 2004 and, especially, during 2005 when about 3.47 million hectares (8.57 million acres) have been staked with uranium as the primary exploration target. This staking has been in two main areas and for three main uranium target types:

- (a) Unconformity- and vein-type uranium deposits in the area underlain by Precambrian basement rocks in northeastern Alberta. This staking has included all or most of the area underlain by Lake Athabasca within Alberta.
- (b) Sediment-hosted uranium deposits, particularly in central Alberta west of Red Deer, and in southern Alberta stretching from near Calgary, south to Pincher Creek, then east to the Cypress Hills.

Uranium is one of the more common elements in the Earth's crust; for example, it is more common than tin, about 40 times more common than silver and 500 times more common than gold (from http://www.cameco.com/uranium_101). The formation of most important uranium deposits is controlled by the contrasting behavior of its two principle oxidation states: (a) the normally immobile reduced uranous ion, U⁴⁺, versus (b) the generally mobile oxidized uranyl ion, U⁶⁺. Also generally important to uranium deposit genesis are: (1) a 'fertile' uranium source (e.g., alkalic igneous rocks or volcanoclastic-rich sediments); (b) a transporting fluid (normally considered to be of igneous hydrothermal origin, or shallow to deep ground water in the case of unconformity-related or sandstone-hosted deposits), and (c) a suitable reductant (such as, for example, graphitic zones, carbonaceous material or sulphides in the host sediments, and coal).

Unconformity and Vein-Type Uranium Deposit Exploration Activity in Northeastern Alberta

Industry participants involved in exploration or ground acquisition during 2005 of the Precambrian in northeastern Alberta include:

- Canalaska Ventures Ltd. (<http://www.canalaska.com>);
- Cogema Resources (<http://www.cogema.com>) at their Maybelle River property, along with their joint venture partners, Cameco Corp. (<http://www.cameco.com>) and JCU (a private Japanese-owned exploration company);
- Dahrouge Geological Ltd. (<http://www.economicgeology.com/dahrouge/dgcl.htm>), believed to be on behalf of Strathmore Minerals Corp. (<http://www.strathmoreminerals.com>);
- North American Gem Ltd. (<http://www.northamericangem.com>);
- Red Dragon Resources (<http://www.reddragonresources.com/corporate>), which is believed to have optioned a large land package in the Athabasca Basin from Robin Day (an Edmonton-based prospector who stakes claims for himself and various companies);
- Sandswamp Exploration Ltd. (<http://sandswamp.com>), which is operated by an Edmonton based prospector, Lester Vanhill, who has been staking claims for himself and for a number of companies;
- TRIEX Minerals Corporation (<http://www.triexminerals.com>), and also
- Paradigm Geological Pty Ltd., Dracula Services Ltd. and a few other individuals or companies.

Little information is available, as yet, about most of the staking and exploration activity for uranium in the Athabasca Basin in northeastern Alberta. However, Ken Wheatley and Craig Cutts (2005) of AREVA (a subsidiary of Cogema Resources Inc.) in a paper presented at the IAEA meeting in Vienna in late June 2005 stated "*The Maybelle River Project in northeastern Alberta hosts a uranium prospect named the Dragon Lake Zone. This mineralized zone is typical of the Athabasca Basin and lies mostly with the basal formation [Fair Point Formation] of the Athabasca Group. The mineralization overlies a graphitic shear zone (the Maybelle River Shear Zone) ... The mineralization, as currently defined, is approximately 110 m strike length, varies from 1 to 40 m in height, and is narrow at 1 to 5 m wide. The mineralized zone trends 160° and cuts across the north-trending shear zone at an oblique angle. Grades vary from several ppm [parts per million] up to 54.5% uranium [64.27% U₃O₈, based on the conversion 1% U equals 1.1792% U₃O₈]. Associated elements are Ni, As, Co, Cu, Pb, Mo and B. The mineralized zone is small but remains open along strike. The potential for further mineralization along the Maybelle River Shear Zone is high.*" As yet, AREVA has not released a resource estimate (tonnes and average grade, or approximate contained uranium poundage) for the Dragon Lake Zone.

In June 2005, Red Dragon Resources Corp. optioned the mineral rights for an area they call the Rae Project, which surrounds COGEMA's Maybelle Project in the western Athabasca Basin. In August 2005, Red Dragon has entered into an agreement with Uranco Inc.; Uranco in order to acquire a 50% interest in the property committed to fund the exploration program on the Rae Project starting with US\$1,000,000 in the first year, followed by US\$2,000,000 in the second year and US\$3,000,000 in the third year. The uranium exploration program is to be staged as follows: airborne geophysical surveys, followed by ground geophysical surveys to determine the best drill targets and, finally, drill testing of selected targets. To date, at least a deep penetration, high resolution airborne electromagnetic survey (VTEM) has been conducted by Geotech Airborne Ltd. on the Rae Project.

On October 14, 2004 Triex Minerals Corporation announced that it had entered into an agreement to acquire a 51% interest in 11 contiguous exploration permits consisting of approximately 220,000 acres (89,000 ha) in the Athabasca Basin in northeast Alberta from Roughrider Uranium Corp., a private British Columbia corporation. The property is along and near the south shore of Lake Athabasca and is named the Old Fort Bay Project. On their website Triex presents as favourable premises that "*previous drilling reported from Old Fort Bay indicated uranium values up to 292 ppm [0.0344% U₃O₈], as well as gold values of 0.08 oz/ton and enrichment of nickel, zinc and silver. A paper published by the Geological Survey of Canada in 1982 suggests that the drilling results obtained may indicate a geochemical halo around an ore deposit*". A 3,000 line-kilometre MEGATEM airborne survey of the property has been completed by FUGRO, and ground geophysical exploration is planned over favourable anomalies detected by the airborne survey.

Further north, near or within the area of Lake Athabasca, Canalaska Ventures Ltd. in an August 8, 2005 press release stated they planned the "*imminent commencement of deep penetrating airborne electromagnetic surveys over its property holdings in the Western Athabasca Basin... The MEGATEM II surveys will cover over 6,000 line kilometres of shallow lake-covered areas that have not previously been evaluated because of historical technical limitations to electromagnetic surveys in lake environments. The high definition MEGATEM II surveys provide immensely superior power levels and digital data imaging, and are expected to define major geological structures, conductive zones and trends normally associated with uranium deposits found elsewhere in the basin.*" Subsequently, in an August 31, 2005 press release they reported the "*commencement of marine seismic surveys for the Company's Athabasca Lake property holdings. A third crew working for the Company, in conjunction with Frontier Geosciences Inc., of North Vancouver, will carry out hydrographic and high resolution seismic*

reflection surveys across the project areas, to model lake depths, bedrock topography, and the depths of the Athabasca "unconformity" contact. In these areas, a high uranium environment, combined with the presence of major basement structures and unconformity style uranium mineralization demonstrate the potential for world-scale uranium deposits." A follow up drilling program is intended for winter 2005/2006, with the start date pending on the ice thickness in Lake Athabasca. As yet, they have not reported on the results of the geophysical surveys or any drilling.

Strathmore Minerals Corporation, which have stated they specialize in the strategic acquisition and development of uranium properties world-wide, owns mineral rights over large areas of the remaining portions of the Athabasca Basin in Alberta, as well as the southern portion of the Alberta Shield along the northern rim of the basin (northern shore of Lake Athabasca); as yet no exploration work has been publicly reported by them.

Finally, there has been little information released about uranium exploration results north of Lake Athabasca where there is potential for structurally controlled vein-type deposits similar to those that exist in Saskatchewan in the formerly active Beaverlodge Lake (Uranium City) camp. Recent reconnaissance geological work on the Alberta Shield by the AGS included re-examination and sampling of several previously reported mineral occurrences. Around one of these occurrences on the south side of Bonny Fault near Andrew Lake in northeasternmost Alberta, the AGS has defined a 100 m by 600 m zone of increased radioactivity that warrants further exploration work. Samples collected from this and other sites on the Alberta Shield are currently being studied in cooperation with the University of Alberta. The microscopic identification of uranium oxides within carbonate-quartz veins near Bonny Fault, in a setting similar to the Beaverlodge uraniumiferous district of Saskatchewan, is a favourable premise for further exploration of the area.

Sediment-hosted Uranium Exploration Activity in Southern and South-Central Alberta

Industry involved in ground acquisition in southern Alberta for sediment-hosted uranium deposits include:

- Dahrouge Geological Ltd. (<http://www.dahrouge.com/Home.htm>; believed to be on behalf of Strathmore Minerals Corp.);
- Firestone Ventures Inc. (<http://www.firestoneventures.com/s/Home.asp>);
- Glenn Hartley (an Edmonton-based geologist believed staking for either his own account or on behalf of clients);
- International Ranger Corp. (<http://www.internationalranger.com>);
- Marum Resources Inc. (<http://www.marumresources.com>);
- Sandswamp Exploration Ltd. (believed to be in part on behalf of North American Gem Inc. and selected other clients);
- Shaun Spelliscy (president of Seagrove Capital Corporation, and believed to be based in Regina, Saskatchewan); and finally
- Rock Ridge Geological Ltd., Commander Petroleum Ltd. and a few other individuals or companies that are shown on the Alberta mineral permit map as holding ground, but for which it is difficult to find out much information about their exploration activities.

The current mineral claim dispositions in southern Alberta are shown on the ADOE website at <http://www.energy.gov.ab.ca/com/RLA/Maps/Metallic+and+Industrial+Minerals+Activity+Maps.htm>, and a summary map showing dispositions by company also exists on the Firestone Ventures

In general, uranium deposits have been grouped into 14 major types based on their geological setting (see for example URL site <http://www.earthsci.org/mindep/depfile/uranium.htm>). Sediment-hosted uranium deposits, which predominantly are sandstone-hosted, constitute about 18% of

world uranium resources. Orebodies of this type are commonly low to medium grade (0.05 - 0.4% U_3O_8) and individual orebodies are small to medium in size (often ranging up to a maximum of about 50,000 t U_3O_8). The main primary uranium minerals are uraninite (UO_2 , which in the cryptocrystalline form is called pitchblende) and coffinite [$U(SiO_4)_{1-x}(OH)_4$]. Conventional mining/milling operations of sandstone-hosted uranium deposits have been progressively undercut by cheaper in situ leach (ISL) mining methods. The United States had and has large resources from sandstone-hosted uranium deposits in the Western Cordillera region, for example in the Powder River Basin in Wyoming, the Colorado Plateau and the Gulf Coast Plain in south Texas. Recently, most of the USA uranium production has been from in ISL mining of these deposits. Other large sandstone deposits occur in Niger, Kazakstan, Uzbekistan, Gabon (Franceville Basin), South Africa (Karoo Basin) and Australia (modified after information provided from URL site <http://www.uic.com.au/nip34.htm>). If sandstone- or other types of sediment-hosted uranium deposits are found within Alberta, it is anticipated that they will or may be geologically analogous to Cameco Corporation's Crow Butte mine in Nebraska (see http://www.cameco.com/operations/uranium/crow_butte¹) and Smith Ranch-Highland mine in Wyoming (see http://www.cameco.com/operations/uranium/highland_smith¹). Cameco states that their Smith Ranch-Highland is the "largest operating uranium production facility in the United States", has "proven and probable reserves totalling 27.4 million pounds U_3O_8 " with an average grade of about 0.11% U_3O_8 , and "Mining at Smith Ranch-Highland uses an environmentally friendly extraction method called in situ leach (ISL)".

Historically during the 1970s and 1980s there was some reconnaissance prospecting for sediment-hosted uranium in southern Alberta as documented in various assessment reports that are on file with the AGS. During the early 1990s the AGS contracted with an Edmonton-based geological consulting firm to prepare a metallogenic evaluation of Alberta; this work resulted in AGS Open File Report 1994-08. This AGS report contained reference to a few selected sites in Cretaceous Willow Creek Formation along the Waterton River that produced anomalous radioactivity up to 2,000 counts per second (cps, by SRAT SPP2N scintillometer) and a rock sample that assayed greater than 2,000 ppm uranium (>0.24% U_3O_8), 13 ppm molybdenum and 78 ppm vanadium. These results are one of the primary initial causes of the uranium staking rush in southwestern Alberta that started late in 2004 and continued through the entire first half of 2005. The believed favourable stratigraphy for sediment-hosted uranium deposits comprises several Cretaceous units, including the Willow Creek, St. Marys River, Ravenscrag and Paskapoo formations.

With respect to publicly reported 2005 results for uranium exploration in southern Alberta, Marum Resources Inc. (<http://www.marumresources.com>) reported they have been searching for sediment-hosted uranium deposits: (a) in Early Proterozoic Belt Supergroup rocks in the Clark Range (where prior work in the 1960s and 1970s identified occurrences with grab samples grading up to 4.8 pounds U_3O_8 per ton, or 0.24 % U_3O_8), (b) in or associated with Cretaceous Crowsnest Volcanic Formation rocks, and (c) for 'Roll-Front' type uranium deposits in Late Cretaceous sedimentary clastic strata in the southwestern Foothills and Plains. In a June 1, 2005 press release Marum reported "two samples, with significant amounts of carbonaceous material, contain extremely high amounts of uranium (5,700 parts per million uranium and 4,990 parts per million uranium). These results are equivalent to 0.57 per cent uranium [0.68 % U_3O_8] (11.4 pounds per ton uranium) and 0.49 per cent uranium [0.58 % U_3O_8] (9.8 pounds per ton uranium)." In a July 25, 2005 press release Marum stated they planned to drill about 15 reconnaissance short (60 m to 100 m depth) diamond drill holes at each of two areas in order to test "favourable stratigraphic targets" in the vicinity of the above anomalously uraniumiferous locales identified by their prospecting and sampling. This drilling was to occur during December 2005, but so far the results of Marum's drill program in southern Alberta have not been reported.

Firestone Ventures Inc. (<http://www.firestoneventures.com/s/Home.asp>) also has been active in 2005 and they reported in a May 3, 2005 press release they had discovered two anomalously radioactive 'zones'. Their reported results include "**Zone 1** - *In the central Alberta Sun claim block centered on the Waterton River, [where] strongly hematite-stained sandstone, carbonaceous material and green shale was [sic] noted throughout the Willow Creek Formation section. Composite grab samples of isolated organic debris material returned 5630 ppm (0.664% U3O8), 6830 ppm (0.805% U3O8) and 7640 ppm (0.901% U3O8) uranium. These three samples also returned above background levels of vanadium, arsenic, selenium, molybdenum, and lead. ... [At] Zone 2 (40 km southeast of Zone 1) - Three rock samples were collected from the southern Alberta Sun claim block centered near the town of Kimball. A grey sandstone boulder which measured 1250 cps (counts per second) radioactivity returned 150 ppm (0.018% U3O8) uranium, 57 ppm vanadium and 22 ppm lead. A grab sample of carbonaceous mudstone from outcrop returned 57 ppm uranium, 52 ppm vanadium and 48 ppm molybdenum. A second grab sample of strongly altered limonitic and carbonaceous mudstone from outcrop returned 92 ppm uranium, 117 ppm vanadium, 31 ppm molybdenum and 53 ppm chromium.*" Firestone planned a follow-up program in early June 2005, but their exploration crews were severely hampered by the inclement rainy weather and flooding during that period. As a result, in a September 14 press release they announced they had re-"commenced a detailed program of data evaluation, mapping, prospecting and sampling on [their] Alberta Sun and Redrock uranium properties in southwestern Alberta." Finally, in a Nov. 17, 2005 press release Firestone stated they were "planning a drill program on the Company's Alberta Sun and Redrock uranium exploration projects southwest of Lethbridge, Alberta, Canada. Firestone Ventures Inc. has a 100% interest in more than 110,000 acres of land prospective for sandstone-hosted, 'roll-front' uranium deposits in southwestern Alberta". As yet, they have not announced whether the drill program has been completed, or any drill results.

North American Gem (NAG; <http://www.northamericangem.com>) reported in a July 25, 2005 press release that they had initiated exploration on their "*Del Bonita*" property, which is near the Canada-USA border due south of Lethbridge, Alberta. However, NAG also had to suspend exploration as a result of the severe rains and flooding in southern Alberta in June 2005. In a September 19, 2005 press release NAG announced the commencement of a Phase 1, geochemical exploration program on their 200,000 acre Del Bonita uranium property and stated they planned to sample "*domestic water sources, for radon gas, uranium and other ions ... [and that the intent of the Phase 1 program was to] delineate exploration targets for Phase 2 investigation by reverse circulation or auger drilling and geophysical logging.*" As yet, there have been no further results reported for the Del Bonita Property.

At Whiskey Gap, which is near but to the west of the Del Bonita property, International Ranger Corp. (<http://www.internationalranger.com>) announced in a July 8, 2005 news release they had "*completed an initial field reconnaissance program on the Whiskey Gap Property in southern Alberta. Samples are at the Saskatchewan Research Council for analysis and results are expected shortly.*" On October 20, 2005 International Ranger announced they had entered into a joint venture agreement with North American Gem for exploration of the 44,400 acre Whiskey Gap uranium property and stated that "*Preliminary sampling of domestic water sources by International Ranger has defined several very strong radon and uranium anomalies in the water, that compare favorably with published radon studies conducted in proximity to sandstone hosted uranium ore bodies in south Texas.*" In the report from International Ranger's consultant (see <http://www.internationalranger.com/Prospect.pdf>) it stated that "*Three radioactive outcrops were located [with] in place radioactivity up to 235 cps (about 4X background [using a Urtec 135 scintillometer]) ... [and] a total of 26 widely distributed water samples [from surface wells] were collected, and sent to the SRC for analysis. ... Radon values ranged from less than 1 Becquerel/litre to 185 Becquerels/litre. The mean radon value was 32.6 Bq/l or 880 picocuries/litre [note that in order to convert Becquerels/ litre to Picocuries/litre, or Bq/L to pC/L, it is necessary*

to multiply by a factor of about 27] ... *Summary inspection of the radon data shows that eight of 26 samples returned values greater than 1000 picocuries/ litre or about 37 Becquerels/litre, two of those samples exceeded 2000 picocuries /litre (88 Bq/litre) and one sample exceeded 5000 picocuries litre (185 Bq/litre). ... [Further,] in order to understand the importance of the [International] Ranger radon survey [results], it is necessary to compare the data to a radon in water study conducted in [South] Texas of 25 domestic wells in an area of known sandstone hosted uranium deposits (Radon in Ground waters of the South Texas Uranium district, Beaman and Tissot 2004). During this study, only private domestic wells were sampled and radon values varied from 42 to 4813 Picocuries per litre; as well, it should be noted that] several wells were in the proximity of known sandstone hosted mineralization, and one well was drilled in a sandstone[-hosted] uranium orebody. The mean radon value for this [South Texas] uranium producing district was 687 picocuries /litre and with the lowest and highest values removed the mean was 526 picocuries /litre. ... The existence of high levels of radon gas in well waters on the [International] Ranger property, compared to similar study in a uranium district of Texas, is very encouraging. The Texas data included a sample [containing] 4813 picocuries per litre [that was] taken from water in a sandstone uranium orebody. The comparable result of sample R107 (5000 picocuries/ litre) from the Whiskey Gap data must be regarded as extremely positive. ... [As well, in comparison to reported radon in water values from Wyoming uranium districts] radon values greater than 1000 picocuries/litre [exist] in 6 counties, including Powder River basin ... that contains most of the currently mined sandstone uranium deposits [in Wyoming]. Radon values exceeding 3000 picocuries per litre (the maximum data category) exist in three counties, including Carbon County where historic uranium production has occurred. ... It remains extremely encouraging that the results of the Ranger Radon survey compare very favorably with one of the best sandstone hosted uranium districts in the USA. ... [Finally,] water collected on the Ranger [Whiskey Gap] property averaged 11 ppb [parts per billion] uranium and the data set contained values as high as 30 ppb, these very high concentrations must also be regarded as an extremely positive indication of a the potential for uranium mineralization as a sandstone hosted deposit." As a result of this preliminary exploration, International Ranger identified: (a) three "Priority One", (b) five ""Priority Two" and (c) three "Priority Three" targets for follow-up exploration. In a November 1, 2005 press release International Ranger announced that they had agreed to jointly explore the 40,000 acre Whiskey Gap property in southern Alberta with North American Gem. On December 2, 2005 International Ranger provided the results from 7 holes they had drilled at their Whiskey Gap property. In summary, the hole depths ranged from 100 m to a maximum of 149.4 m and contained reported 'radioactive zones' that had maximum gamma ray radioactivity ranging from 175 API units across 1.0 m, up to 782 API units across 5.0 m. Their press release further stated that "the measurement scale of the gamma-ray log is in API (American Petroleum Institute) units, and [this] is accepted as the international reference standard that allows consistent comparisons to be made between a wide variety of gamma-ray counting devices. The API standard was conceived originally so that a typical shale would register at about 100 API units."*

To complement this statement about API radioactivity levels, the AGS advises that the 'normal' API range for sediments in the Western Canada Sedimentary Basin (WCSB) is about 0 to 125 API, with shale and mudstone ranging from about 90 to 125 API, sandstone (including conglomerate and concretions) ranging from about 5 to 50 API, and carbonate ranging from 0 to 30 API. In contrast, the API levels for some of the more radioactive sedimentary intervals, such as those in the First or Second White Specks, or the bentonites in the WCSB, can range from about 120 to 500+ API units. With respect to the comparison between API and counts per second (cps), according to Schlumberger (the largest and perhaps most experienced logging and log interpretation company), 0 to 300 API typically equates to 0 to 163 cps on a gamma ray log. Thus, the typical cps ranges for the sediment in the WCSB should be about 49 to 68 cps for shale and mudstone, 3 to 27 cps for sandstone, 0 to 16 cps for carbonate, and 65–272+ for

some of the more radioactive sedimentary materials in the WCSB (Dong Chen, AGS Well Log Specialist, personal communication, Jan. 5, 2006).

Finally with respect to the Whiskey Gap property, North American Gem reported in a December 6, 2005 press release that they had *“begun to drill the 12th hole on the Whiskey Gap project located in southern Alberta. Also at this time the Company is awaiting the preliminary assay results from the Saskatchewan Research Council.”* As of early January 2006, the results from these latter 5 holes drilled at Whiskey Gap have not been reported.

Solitaire Minerals Corp. (<http://www.solitaireminerals.com>), which has some of the same principals as in North American Gem, stated in an October 17, 2005 press release that they have *“signed a letter of intent with Sandswamp Exploration Ltd. to purchase 100% interest in 4 metallic and industrial mineral permits collectively referred to as “The Ravenscrag Uranium Property”, totaling approximately 88,000 acres. These four permits were strategically staked to target five main continentally derived sedimentary formations ... These formations include the Tertiary aged ‘Cypress Hills’ and ‘Ravenscrag’ sandstone formations and the Upper Cretaceous ‘Whitemud’ and ‘Eastend’ sandstone formations in addition to channel sands within the ‘Bearpaw shale formation. All of these formations are very similar in age and material composition as the south-western Alberta ‘Willow Creek’, ‘St. Mary River’, and ‘Blood Reserve’ formations already being explored by other uranium exploration companies [in southern Alberta] with favourable, reported results.”* At present, there are no further exploration results reported by Solitaire for southeastern Alberta.

Strathmore Minerals Ltd. (<http://www.strathmoreminerals.com/s/Home.asp>) have extensive landholdings in southwestern Alberta (which were reportedly staked on their behalf by Dahrouge Geological Ltd.). However, based on their press releases, they as yet have not reported on any exploration done within southern Alberta uranium properties.

Finally, with respect to the other companies and individuals that acquired mineral properties for uranium exploration in southern Alberta, as yet there have been no or little reported results.

Precious, Base and Ferrous Metals

Reported results indicate there was little or no exploration for precious or base metals within Alberta during 2005. However, there was an interesting M.Sc. thesis, which was supported by the AGS, completed at the University of Alberta by a Ms. Kelli Fraser during 2005. Fraser studied the Cenomanian-Turonian Second White Specks Formation to evaluate the units ‘Sedex’ base-precious metal potential and she reported from her work that some maximum geochemical concentrations for this unit comprise 1,331 ppb silver, 140 ppm copper, 169 ppm molybdenum, 290 ppm nickel, 469 ppm zinc, 22.1% sulphur and 10.8% organic carbon. Finally, Fraser noted that *“some [Second White Specks] locations are enriched enough in organic carbon and metals to be geochemically classified as a metalliferous black shale.”*

In 2005, ferrous minerals were again of exploration interest in Alberta, including work by: (a) Micrex Development Corp. at their Burmis magnetite deposit near Crowsnest Pass, and (b) Clear Hills Iron Ltd. for sediment-hosted ooidal ironstone within the Bad Heart Formation in the Clear Hills northwest of Peace River.

With respect to 2005 work on the Burmis paleoplacer magnetite deposits in late Cretaceous basal sandstones of the Belly River Formation, Micrex Development Ltd. stated in a July 5, 2005 press release *“field crews have recently completed the Spring/Early Summer study of the Burmis Area in Southwestern Alberta. This study completes a four-season examination of the Burmis site. With the co-operation of local landowners, industry experts carried out detailed*

studies of land, water and wildlife in the Burmis area. This study will be combined with the studies announced in an earlier press release to be part of the revised mining permit submission that Micrex is working on. ... Studies include many factors including wildlife, plants, air and water quality and ambient noise levels among other data and will ensure that the revised mine permit application will be a complete and comprehensive document. No issues have been identified that could interfere with mine permitting. Micrex continues to fine-tune its mine proposal utilizing the data compiled by independent industry experts during the ongoing study period.” On October 3, 2005 Micrex stated “*collection of data for environmental studies related to the Burmis magnetite deposit have been completed, and that documentation required to support the mining application is now being prepared.*” Based on this, it would seem that Micrex hopes to start commercial production of magnetite sometime in the near future, with their product intended primarily for use in coal beneficiation in southeastern B.C.

In northwestern Alberta, prior work by both industry and the Alberta Geological Survey indicated there is a potential iron ‘resource’ of over 1 billion tonnes at a grade of about 35% iron in one or more ferroan ooidal ironstone deposits within the Late Cretaceous Bad Heart Formation. In 2004, two interrelated companies, Clear Hills Iron Ltd. and Peace River Energy Ltd., both of which are Canadian subsidiaries of a United States of America company, Goldspring Inc. (<http://www.goldspring.us/index.cfm>), were active in the Clear Hills region. However, during winter 2004/2005 there was management and corporate re-structuring at Goldspring Inc., and as a result, there was essentially no significant field exploration by their Canadian subsidiaries in the Clear Hills region during 2005, although a Calgary consultant in their employ continued selected office compilations of data. Most recently, Goldspring Inc. on September 15, 2005 stated the “*Clear Hills Iron project was granted mineral permits for all non-energy minerals on an 800 square mile land parcel in Alberta, Canada. This project is in the early stages of pre-feasibility and study. The Company is also considering joint venture opportunities for the development of this project.*” This seems to confirm recent suggestions that the company is seeking partners for further exploration of their mineral and coal properties in the Clear Hills region in northwestern Alberta.

Partly as a result of this relative lack of exploration activity of the potential iron resources in the Clear Hills region, the Alberta Geological Survey initiated a multi-year project during 2004 intended to provide data and information that will continue to stimulate both iron and coal resources exploration and development in this region. This project was continued by the AGS during summer and early fall 2005 with mechanical trenching of selected outcrops and geochemical sampling, and ongoing collaborative work with the Earth & Atmospheric Sciences and Materials Engineering Departments at the University of Alberta, the Geological Survey of Canada in Calgary, and the Applied Stratigraphy Research Group at the University of Calgary.

Industrial Minerals

Building Stone

The highly recognizable Alberta building stone known as ‘Rundle Rock’, or ‘Rundlestone’, is produced at only two quarries that are both in the Bow Valley east of Banff, but on opposite sides of the valley. There currently are two producers, which are Kamenka Quarry Ltd. (<http://buildingstoneinstitute.org/index.htm>) located near Harvie Heights and Thunderstone Quarries (<http://www.thunderstonequarry.com/index.php>) that is producing from a quarry near Dead Man Flat’s. Rundle Rock is a flaggy, fine-grained sandstone/siltstone from the Triassic Spray River Group and is best known as the rock that was in the latter part of the 1880s used to build the world famous Banff Springs Hotel in Banff, Alberta.

Mineral aggregate

In a news release on December 23, 2005 Birch Mountain Resources Ltd (<http://www.birchmountain.com>) of Calgary reported the opening of its Muskeg Valley Quarry and the mining of about 800,000 cubic metres of crushed stone aggregate. This quarry is located north of Fort McMurray, Alberta. Materials are being sold through their marketing joint venture, named Hammerstone Products Ltd. Birch Mountain has extensive mineral holdings in the oil sands region of northeastern Alberta. In addition to construction aggregates, Birch Mountain is testing limestone for use as quicklime in applications such as flue gas desulphurization, water treatment, pulp and paper manufacturing and soil stabilization.

The opening of a quarry specific to crushed stone is one of several signs that aggregate is expanding in both economy and profile. Natural Resources Canada (NRC) (<http://mmsd1.mms.nrcan.gc.ca/mmsd/default.html>) reported for 2004 that in Alberta about 45,386 kilotonnes of the traditional source of Alberta aggregate, sand and gravel, was produced and its production value exceeded \$200 million. The Alberta Sand and Gravel Association (ASGA) now has a website (<http://www.asga.ab.ca/index.html>), a newsletter (The Scoop) and a membership of over 125 companies. Recent regulatory changes within Alberta include the signing of a Memorandum of Understanding for information exchange between NRC and five Alberta departments (Energy, Transportation, Sustainable Resource Development, Finance, and the Energy and Utilities Board) and the development and promotion by the ASGA of a Gravel Truck Registry in response to public and industry concerns on the perceived and real conduct of gravel truck traffic and the negative effects these concerns have on the permitting of gravel resources.

Coal

Alberta contains a vast amount of coal resources (630 billion tonnes), of which 33 billion tonnes are classified as recoverable reserves (<http://www.eub.gov.ab.ca>). To date, Alberta has produced just over 1 billion tonnes of coal. Annual production is in the order of 30 million tonnes per year. Low rank subbituminous coal accounts for approximately 85% of production, and this coal is primarily consumed at mine mouth power generation stations. The remaining production (approximately 3 to 4 million tonnes/year) is metallurgical coal; this is primarily mined and exported for use in the steelmaking industry in overseas markets. AGS and industry prior geological mapping has identified the distribution of coal type as being: (a) high rank metallurgical coal in the Foothills and Mountains, and (b) low rank thermal coals in the Plains region of Alberta. At present, there are nine major coal mines in Alberta, two of which produce metallurgical coal.

As a result of higher coal prices there has been renewed interest in coal exploration and development within Alberta. As a consequence, numerous companies have been examining coal geology reports and coal quality data housed at the AGS and the EUB, as well as land disposition and regulations related to coal mining at the Alberta Department of Energy. Alberta has had renewed exploration and development of various types of coal, including: (a) higher priced metallurgical coals within the Foothills, (b) shallow thermal coal reserves in the Plains for electric power generation, and (c) coal as a source of coal bed methane. Interest has also been shown in the potential of Alberta coals as a feedstock for coal gasification (both surface and in-situ processes). Although developing a coal resource for mining or in-situ processing may be a slow process, coal exploration and development activity within Alberta is expected to increase markedly over the next few years.

High quality export thermal coal prices have increased over the past few years from a low of about 10 US\$/ton (note that coal prices normally are quoted in US\$ per short ton) to the current

price of approximately 40.00 US\$/ton. The price of domestic thermal coal is lower, but price is secondary to having a long term secure supply and mining operations situated near power plants. Having said this, coal-fired electrical generation plants are costly and time consuming to build, hence within Alberta during the past five years the only 'new' thermal coal project is that at Bow City, south of Brooks (<http://www.luscar.com>).

Metallurgical coal is also attracting the attention of industry in Alberta. This is because hard coking metallurgical coal prices have risen from approximately \$40US\$/ton in 2002 to 2003, up to 125 US\$/ton in 2005. Soft coking metallurgical coal prices have also been strong, averaging 78.00 US\$/ton in 2005. Although world prices are projected to weaken in 2006, these recent high prices have caused a renewed interest in Alberta metallurgical coal. For example, Elk Valley Coal Ltd. is now producing metallurgical coal from their Cardinal River/Cheviot Creek operation, with an anticipated capacity of 2.8 million tonnes per year. As well, Grande Cache Coal Ltd. has renewed metallurgical coal mining near Grande Cache, with a planned production of up to 2 million tonnes per year.

Although conventional metallurgical and subbituminous coals have seen a resurgence of interest within Alberta driven by increasing coal prices, perhaps the greatest recent interest in coals in Alberta has been from the booming coal-bed methane industry. This has resulted in the drilling of some 2,500 relatively shallow wells within Alberta during 2005 to explore the coal bed methane potential of the Horseshoe Canyon, Belly River, Mannville and Ardley formations. As a result of this work, there now are approximately 6,000 coal-bed methane wells that are producing in the order of 250 million cubic feet of gas per day, with most of this production from the Horseshoe Canyon Formation in central Alberta. There remains, however, large potential for other coal-bed methane production from several other parts of Alberta.

Table 1: Mineral Claims Staked and Assessment Work Filed, 2001 to 2005, in Alberta.

ACTIVITY	2001	2002	2003	2004	2005
Claims Staked (Permits¹ Applied For)					
Number of applications accepted	Not available	522	322	533	573
Millions of Hectares	2.5 Million ha	4.1 Million ha	2.9 Million ha	4.7 Million ha	5.2 Million ha
Permits in Good Standing					
Number of agreements	Not available	1,409	1,276	866	1,333
Active hectares	8.2 Million ha	11.2 Million ha	10.2 Million ha	6.3 Million ha	9.9 Million ha
Mineral Assessment Filed					
Number of reports	14	14	10	24	10
Number of Permits Represented	255	203	44	184	40
Hectares Represented	2.0 Million ha	1.4 Million ha	0.2 Million ha	1.2 Million ha	0.2 Million ha
Expenditures Filed	\$2.0 Million	\$11.8 Million	\$0.6 Million	\$0.9 Million	\$0.85 Million

¹NOTE: In Alberta, mineral claims for exploration are called metallic and industrial mineral permits.