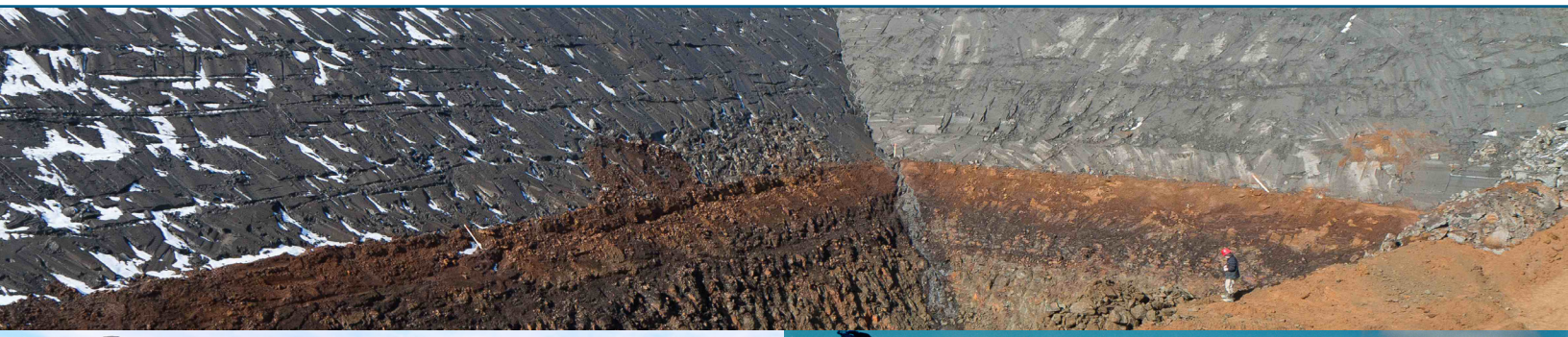
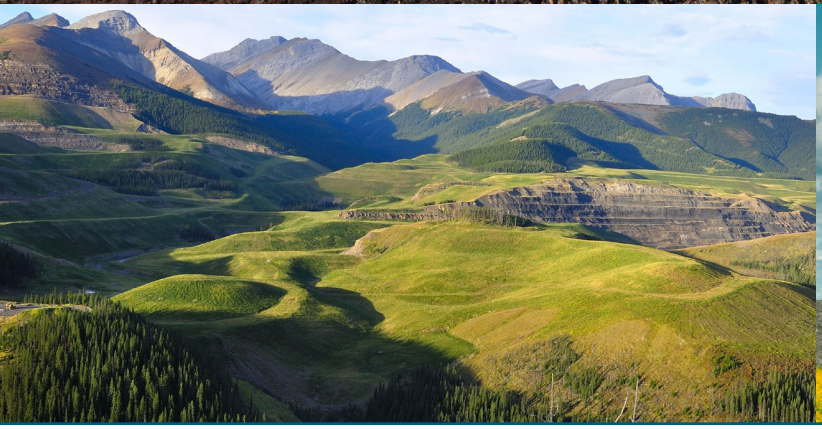
Coal and Mineral Development in Alberta
2012 Year in Review





Metallic and industrial mineral activity
Coal mining and projects
Land-use planning
Alberta mineral tenure and royalty
Mineral assessment reports

Alberta Government

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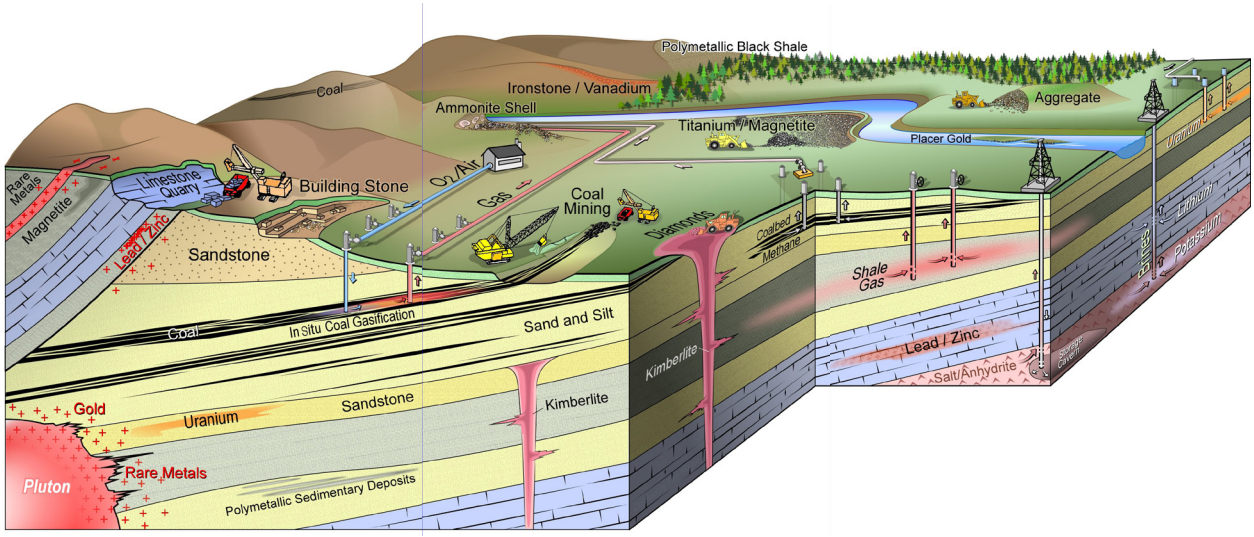
Top: North Whitemud River bulk sample pit. Courtesy Ironstone Resources. *Bottom left:* Reclaimed Gregg River Mine. Courtesy Sherritt Coal. *Bottom right:* Bigfoot dragline at the Paintearth Mine. Courtesy Sherritt Coal.

Below: Dan McGee, Energy Resource Conservation Board/Alberta Geological Survey.



Introduction

The past year saw a variety of activity throughout Alberta, particularly in the coal sector. There was continued interest in bituminous coal from the Foothills and mountains regions of the province. Alberta Energy received a significant increase in the number and area of coal lease applications in both regions. Coalspur Mines Ltd. submitted their application to begin development on the first phase of their proposed Vista Mine, near Hinton. This project is positioned to potentially be the largest exporter of thermal coal in North America. Some of the existing coal mines also moved expansion projects forward. Read more, starting on page 10.

Work continued in 2012 on Ironstone Resources' Clear Hills Iron project and DNI Metals' Polymetallic Black Shale project, which are the province's most significant metallic mineral projects. Read more, starting on page 3.

Alberta Energy has begun reviewing Alberta's coal development policy as there has not been an update since *A Coal Development Policy* was published in 1976. Read more, starting on page 15.

The first regional plan was publicly released in the fall of the past year, as part of Alberta's Land-use Framework. The Lower Athabasca Regional Plan establishes a number of Conservation areas and Recreation and Tourism areas within the region. Read more, starting on page 16.

2012 metallic and industrial mineral exploration highlights

The total area covered by metallic and industrial minerals permits is the same as the previous year; however, the number of permits decreased by almost 30% (Figure1). The total number of metallic and industrial minerals leases in Alberta remained approximately the same in 2012 as 2011 (Figure 2). Permit activity was spread throughout the province in 2012; this is likely the result of moderate exploration activity across a number of different commodities throughout the province.

Base metals

Alberta still remains prospective for base metals in various locations throughout the province. No major base metal exploration work was reported during 2012; however, several new permits were acquired in areas of base metal potential.

Diamond

The Buffalo Head Hills and other localities in northern Alberta still remain prospective for diamonds. Three assessment reports were filed in 2011 and the metallic and industrial mineral permits remain in good standing.

The Alberta Geological Survey (AGS) published Bulletin 65, "The Northern Alberta Kimberlite Province: The First 20 Years" at the end of 2011. This publication reviews 20 years of diamond exploration in northern Alberta from 1990 through 2010. It is an excellent source of information about Alberta's kimberlites and bedrock geology of the northern part of the province. It is available at no cost from the AGS (*www.ags.gov.ab.ca*).

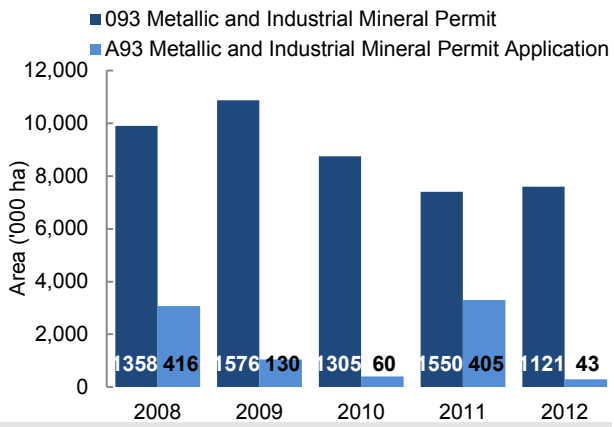


Figure 1. A bar graph with the total area of MIM permits and permit applications from 2008 through 2012 (each year is October 1 through September 31). Numbers at the base of the bars indicate the number of individual permits or applications.

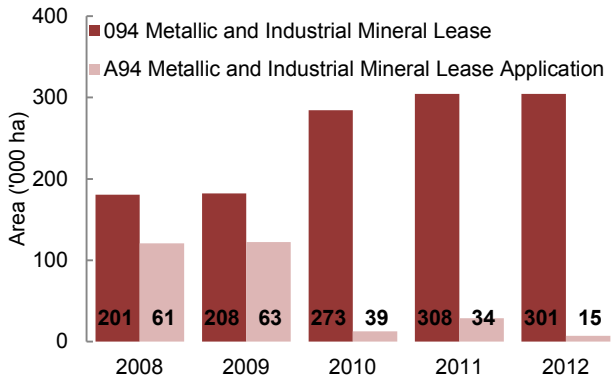


Figure 2. A bar graph with the total area of MIM leases and lease applications from 2008 through 2012 (each year is October 1 through September 31). Numbers at the base of the bars indicate the number of individual leases or applications.

Iron

Ironstone Resources (*www.ironstoneresources.com*) updated the resource estimate for its Clear Hills property after receiving a second NI 43-101 technical report from SRK Consulting, in April 2012. The new report combines the Rambling Creek and North Whitemud River projects. Ironstone reports an indicated mineral resource of 556 million tonnes (33.3% Fe and 0.20% V_2O_5) and inferred mineral resource of 87 million tonnes (34.1% Fe; Table 1).

The company completed a 31-hole drill program on the South Whitemud River block in 2012, which confirmed the extent of the deposit over 30 kilometres in a northwest-southeast trend. This brings the total number of holes drilled to 230 by Ironstone on the Clear Hills property. Analytical results from the 2012 drilling are expected in early 2013.

In addition to drilling and exploration, Ironstone is in the process flow engineering stage of development. They have partnered with a number of consulting pyro-technology companies to build upon work done by the Alberta Research Council in the 1970s. Their experimental processes use a custom-designed kiln to metallize and enlarge the fine grained iron particles in order to facilitate magnetic separation. Their intention is to form the iron oxide ore into high-value, uniform (~96% Fe) metallic iron briquettes for easy shipment. Through 2012, small-scale batch and continuous pilot work was completed by Ironstone, with mid-size, commercially scalable, continuous testing to be completed by mid-2013. Ironstone is currently experimenting with a multi-stage direct reduction/iron segregation and vanadium extraction process. Their goal is to produce iron units, in 95% Fe hot briquette form, and vanadium pentaoxide (V_2O_5). Process development is being done using 11,000 tonnes of stockpiled material extracted from the bulk sample pit excavated in 2011 on the North Whitemud River deposit (Figure 3).

The Clear Hills Iron property is located in the Clear Hills area of northwest Alberta. Iron mineralization in the Clear Hills area is hosted in the upper Cretaceous Bad Heart Formation.

In addition to their Clear Hills property, Ironstone also holds metallic and industrial mineral permits on two other properties: Botha River and Smoky River, both of which Ironstone anticipates may host similar mineralization as the Clear Hills property. They have completed drilling at their Botha River property, which is located approximately 80 km northeast of their Clear Hills property. This 2012 drilling is the first completed on the property by Ironstone. Analytical work was expected at the end of 2012.

	Tonnes (x1000)	Fe (%)	SiO_2 (%)	V_2O_5 (%)
Indicated	556,521	33.30	24.37	0.20
Inferred	86,871	34.07	26.23	

Table 1. The indicated and inferred resources from the Rambling Creek-North Whitemud River iron deposit on their Clear Hills property. Source: Ironstone Resources news release (April 2012)

Figure 3. Photos of the bulk sample pit at Ironstone Resource's Clear Hills iron project. The pit was excavated in 2011 on the North Whitemud River block. The ironstone is the easily idetifiable dark brown-orange band in the bottom half of the pit. A truck and person (bottom) for scale. Photos courtesy of Ironstone Resources.

Limestone

Limestone is an important industrial mineral mined in Alberta. Currently there are a number of exploration projects looking for limestone for various uses, including crushed aggregate and high quality limestone for lime production.

Dahrouge Geological Consulting Limited (*www.dahrouge.com)* holds land in the Nordegg area, in the Rocky Mountain foothills, and Graymont Western Canada Incorporated (*www.graymont.com*) has exploration properties in the Clearwater and Rocky Mountain House areas. Hammerstone Corporation (*www.hammerstone.com*) continues to develop their holdings in the Fort McMurray area in northeast Alberta. Their Muskeg Valley quarry is currently quarrying limestone that underlies oil sands.

Lithium

Channel Resources Limited (*www.channelresources.ca*) released a NI 43-101 technical report for their Fox Creek property in west-central Alberta in the spring of 2012. The resource calculations used previously-published geochemical well data along with data collected during sampling by Channel Resources during 2009-2010; it also includes a hydrogeological study. This report may be the first published for lithium from oil field saline formation water. The technical report provides an inferred in-place resource estimate for the property. Because recoverability of the described metals was not taken into account, the in-place resource is a qualified estimate of the total amount available. Further study is required to determine the recoverability and economic viability of extracting metals from the brines.

The "mineralization" is found within the Beaverhill Lake aquifer system, which is within the upper Devonian Beaverhill Lake Group. The aquifer is confined at the bottom by salt of the Elk Point Group and above by shales of the Ireton Formation [1]. The metals found in the brines include lithium, potassium, boron, bromine, calcium, magnesium and sodium. Concentrations and resource estimates are provided in Table 2.

Four mineral assessment reports were submitted in 2011 that reported on lithium exploration results from the Fox Creek – Valleyview area.

Placer gold

There was a continued increase in metallic and industrial mineral licences (for recreational placer mining) over the past year (see Figure 4). The total number of active licences almost doubled from 466 in 2011 to 818 at the end of September 2012. The reason for the increased interest over the last two years is unclear; however, high gold prices and the emergence of placer mining on reality television may be contributing factors.

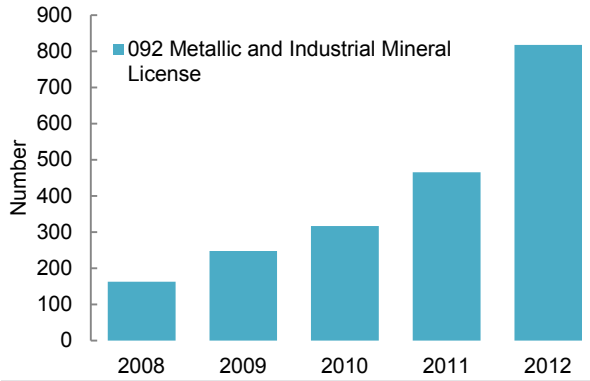


Figure 4. A bar graph with the total area of MIM llicences from 2008 through 2012 (each year is October 1 through September 31).

Polymetallic shale

DNI Metals Inc (*www.dnimetals.com*) completed 980 metres of drilling on the Buckton and Buckton South zones at their Alberta polymetallic black shale project in the Athabasca region of northeast Alberta. Samples collected from drilling were not yet analyzed at the end of 2012. All except one of the nine drill holes intersected the mineralization-hosting upper Cretaceous Second White Speckled Formation.

Previously thought to be barren cover rocks, DNI announced that they found mineralization in black shales of the Labiche Formation, which overlies the Second White Speckled Formation. Their findings were reported in a technical report, released in September 2012. Data for the new technical report is from analysis of core drilled during DNI's 2010-2011 winter drilling. The inferred resource is summarized in Table 3.

During the past year DNI also began a life-cycle audit and environmental baseline study on the property. They have also engaged CANMET to develop a heap leach and REE separation process. At the end of 2012, DNI had secured financing to continue their exploration and work towards a future scoping study of the property.

	Li	K	B	Br	Ca	Mg	Na
Average grade (mg/L)	88.3	4,595.5	169.2	325.5	13,353.8	2,817.7	59,815.4
In-place resource[1] (x1000 tonnes)	362	18,800	694	1,330	54,800	11,600	245,000

[1] in-place resource calculated by grade x volume of total in-place formation water (4.1 billion m^3).

Table 2. The average grade and in-place resources from oil field brine samples. Source: Channel Resources' Fox Creek Project 43-101 Technical Report (March 2012).

[1] Bachu, S., Underschultz, J.R., Hitchon, B. and Cotterill, D. (1993). Regional-scale subsurface hydrogeology in northeast Alberta. Alberta Research Council/Alberta Geological Survey, Bulletin No. 61, 44p.

Potash

Although salt is prevalent in the lower and middle Devonian Elk Point Group through much of Alberta, the extent to which potash is present is not fully understood. Somewhere between the potash mines in Saskatchewan and central Alberta, the Prairie Evaporite Formation transitions from sylvite (KCl; potash)-rich to halite (NaCl; salt)-rich. In their study of the Elk Point Group, Eccles et al. (2009) [2] found that there is "potential for the presence of potash pockets in the uppermost Prairie Evaporite Formation of eastern Alberta."

Pacific Potash Corporation (*www.pacificpotash.com*) reported analytical results, from their 2011 drilling on their Provost Potash property, early in 2012. The property is located along the Alberta-Saskatchewan border, near Provost, Alberta. Drill-hole PPC-37 cored two zones of sylvite mineralization (Upper and Lower zones) within the Patience Lake member of the Prairie Evaporite Formation. Drill-hole PPC-38 produced core from the Lower zone of sylvite mineralization.

Grizzly Discoveries Incorporated (*www.grizzlydiscoveries.com*) also completed exploration drilling late in 2011. Results, published in early 2012, reported two zones of potash mineralization intersected in drill-holes located on Grizzly's Alberta Potash Project near Medicine Hat, and its 50% shared property with Pacific Potash. Mineralization was intersected within the Prairie Evaporite Formation. Two zones of mineralization were intersected: deeper at the Alberta Potash property and shallower at the Provost (50:50) property.

The analytical results reported by Pacific Potash and Grizzly Discoveries are displayed in Table 4.

Both Grizzly and Pacific Potash have plans for additional exploration drilling through the winter of 2012/2013.

Uranium

A limited amount of uranium exploration is currently ongoing throughout Alberta; several companies are maintaining their exploration rights on several properties that are prospective for uranium. Three assessment reports were submitted for uranium exploration work in 2011 and 2012. Two were for work in southern Alberta; one was in the Athabasca region in the northeastern corner of the province.

Properties in the Lower Athabasca region, in northeast Alberta, are being explored for unconformity-type uranium mineralization, which is analogous to the uranium mineralization that is currently mined in the Athabasca basin in Saskatchewan.

Inferred resource (tonnes)	2,483,546,851				
Recoverable grade (ppm)					
MoO_2	2	La_2O_3	7	Dy_2O_3	3
Ni	39	Ce_2O_3	21	Ho_2O_3	4
U_3O_8	4	Pr_2O_3	3	Er_2O_3	2
V_2O_5	45	Nd_2O_3	13	Yb_2O_3	1
Zn	107	Sm_2O_3	4	Lu_2O_3	0.3
Cu	20	Eu_2O_3	1	Y_2O_3	18
Co	10	Gd_2O_3	4	Sc_2O_3	7
Li_2CO_3	160	Tb_2O_3	1	ThO_2	4

Table 3. The recoverable grades for Labiche shale that overlies the Second White Speckled formation at DNI Metals' Alberta Polymetallic Black Shale property. Source: DNI Metals' press release (September 2012).

	Depth (m)		KCl	K_2O
	From	**To**	**(%)**	**(wt %)**
Pacific Potash Corp. - Provost				
PPC-37				
Upper	1327.25	1330.35	18.76	11.85
includes	1327.45	1329	29.7	18.76
Lower	1341.6	1342	33.64	21.25
PPC-38				
Lower	1349.05	1349.35	34.11	21.55
Grizzly Discoveries Inc. – Alberta Potash				
GZD100				
Upper	1649.4	1653.95	10.14	6.4
includes	1649.7	1652.35	13.88	8.77
includes	1651.2	1652.35	20.58	13
includes	1651.7	1652	49.23	31.1
Lower	1661.7	1665	3.88	2.45
Pacific Potash/Grizzly – Provost (50:50)				
PPC-40				
Upper	1258.85	1263.35	4.97	3.14
includes	1258.85	1259.6	6.58	2.46
Lower	1280.7	1281.8	8.54	5.39

Table 4. Drill exploration highlights from three potash projects in southeast Alberta. Source: Pacific Potash press release and Grizzly Discoveries press releases (February 2012)

[2] Eccles, D.R., Al-Souqi, M., Grattan, K. and Dufresne, M.B. (2009). Preliminary investigation of potash potential in Alberta. Energy Resources Conservation Board/Alberta Geological Survey, Open File Report 2009-20, 29p.

Figure 5. Limestone being loaded onto a truck at Hammerstone Corporation's quarry operations near Fort McMurray. Photo courtesy of Hammerstone Corporation.

Exploration in southern Alberta is focused on sandstone-hosted roll front-type uranium mineralization. Sandstone-hosted deposits are often mined through in situ leaching (ISL) techniques. This is attractive because the uranium can be extracted with minimal surface disturbance. The ISL process uses a fluid to leach the uranium and bring it to surface in solution.

Active uranium exploration properties include Areva Resources Canada Incorporated's (*www.us.areva.com*) Rea project in northeast Alberta, and Zadar Ventures Limited's (*www.zadarventures.com*) Whiskey Gap project in southern Alberta.

Mineral assessment reports

There were 21 mineral assessment reports submitted to Alberta Energy in 2012. The total amount of accepted exploration expenditures was $15,179,435 over 2,365,213 hectares of land across the province (Table 5). The exploration work reported over the past year was for work over the past two years.

The appendix, at the end of this document, lists the mineral assessment reports that were filed in 2011 and 2012. All of the reports listed are publicly available after a one-year confidentiality period. Please contact the Coal and Mineral Development Branch at Alberta Energy for a copy of an assessment report.

Mine activities – metallic and industrial minerals

Production. Quarriable minerals include limestone, sandstone, shale, silica sand and dolomitic siltstone; production was up by over three million tonnes between 2011 and 2012. Limestone accounts for the largest proportion of the quarriable mineral production. Salt production remained constant and placer gold production was down significantly from the previous year. See Tables 6 and 7 for production amount during 2012.

Royalty. Because the royalty rates for quarriable minerals, salt and placer gold are all fixed, production based-rates, the royalties collected changes based on production changes. Metallic mineral royalty is revenue-based but there is no production, currently, of metallic minerals. Royalty rates for metallic and industrial minerals are provided in Table 8.

Limestone

The Natural Resources Conservation Board (NRCB) is currently reviewing Parsons Creek Aggregate's (*www.parsoncreekresources.com*) Limestone Quarry project, which is a joint venture between Graymont Western Canada Incorporated and Lehigh Hanson Materials Limited (*www.lehighhansoncanada.com*). The development application was originally filed in the summer of 2010. The proposed quarry and related facilities are located on 390 hectares of land near Fort McMurray. The primary use for the quarried limestone will be as crushed aggregate for local construction projects. See Figure 5 and 6 for images of Hammerstone's operation.

Mineral assessment report statistics

Year	Reports	Permits	Area (ha)	Permit area with expenditures (ha)	Accepted expenditures	Payment in lieu
2008	32	527	2,919,806	1,637,142	$16,278,661	$92,360
2009	21	430	2,625,110	704,873	$8,254,883	$0
2010	23	261	1,690,880	503,276	$5,772,404	$0
2011	19	112	642,758	223,146	$1,953,248	$39,712
2012	21	343	2,392,416	2,365,213	$15,179,435	$0

Table 5. A table of mineral assessment report statistics for 2008 through 2012. Permits and area are what was submitted in reports. Permit area with expenditures and accepted expenditures are values accepted by the department. Payment in lieu is a cash payment in place of exploration expenditures; this is allowed one time per permit. Accepted values for 2012 include some expenditures that had not been approved at time of publishing.

for your information

Established in 1991, the **Natural Resources Conservation Board** (NRCB) is responsible for reviewing major, non-energy natural resource projects. A NRCB review is triggered if the proposed project requires an Environmental Impact Assessment (EIA) or it is referred for review by government through an Order in Council. Alberta Environment and Sustainable Resource Development make the determination whether an EIA is required. During a review, the NRCB considers the project's potential effect on the environment, community and economy. Public notification and community participation are coordinated by the NRCB during the project review. [www.nrcb.gov.ab.ca]

Quarriable mineral royalty

Year	Production (t)	Royalty ($)
2008	7,076,311	$312,104
2009	9,437,749	$416,944
2010	12,078,733	$551,439
2011	7,980,265	$363,661
2012	11,024,698	$521,071

Table 6. The total production and royalty collected for 2012 and the previous four years, for quarriable minerals. Each year period is from October 1 to September 31.

Salt royalty

Year	Production (t)	Royalty ($)
2008	227,327	$102,297
2009	224,866	$101,190
2010	257,935	$116,071
2011	239,061	$107,577
2012	246,968	$111,136

Table 7. The total production and royalty collected for 2012 and the previous four years, for salt. Each year period is from October 1 to September 31.

Metallic and industrial mineral royalty rates

Metallic	Pre-Payout:	1% mmr[a]
	Post-Payout: greater of	1% mmr or 12 % nr[b]
Placer	5% of value after the first troy ounce	
Quarriable	Bentonite:	$0.11/t
	Other clay, marl, volcanic ash:	$0.131/m^3
	Pottery clay, fireclay:	$0.0655/ m^3
	Limestone, shale, granite, slate, gypsum, building stone:	$0.0441/t
	Silica sand:	$0.37/t
Salt	Dry salt, solute salt	$0.45/t

[a]mmr: mine mouth revenue

[b]nr: net revenue

Table 8. Alberta's metallic and industrial mineral royalty rates.

Heavy minerals

Titanium Corporation (*www.titaniumcorporation.com*) continued to develop their process for extracting heavy minerals and residual bitumen from oil sands tailings. They were awarded a Canadian Patent for their technology in the fall of 2012; additional patent applications are being processed. Titanium Corporation's plan is to integrate their technology into the current oil sands processing circuits and process the tailings before they are sent to settling ponds. Along with an initial production of 170,000 tonnes per year of zircon, Titanium reports they will be able to recover 80% of the residual bitumen and 75% of the solvents within the tailings. Production forecasts are up to 400,000 tonnes per year by 2020. The company suggests that the oil sands deposits contain almost 1% heavy minerals, which are concentrated to approximately 25% in the sand fraction, during the primary bitumen recovery process [3].

Figure 6. Crushed limestone on a conveyer at Hammerstone Corporation's quarry operations near Fort McMurray. Photo courtesy of Hammerstone Corporation.

[3] An overview of Titanium Corporation's operation was recently published: Zircon from a unique source, Mineral Sands Report, Issue 197, March 2012, p.11-15.

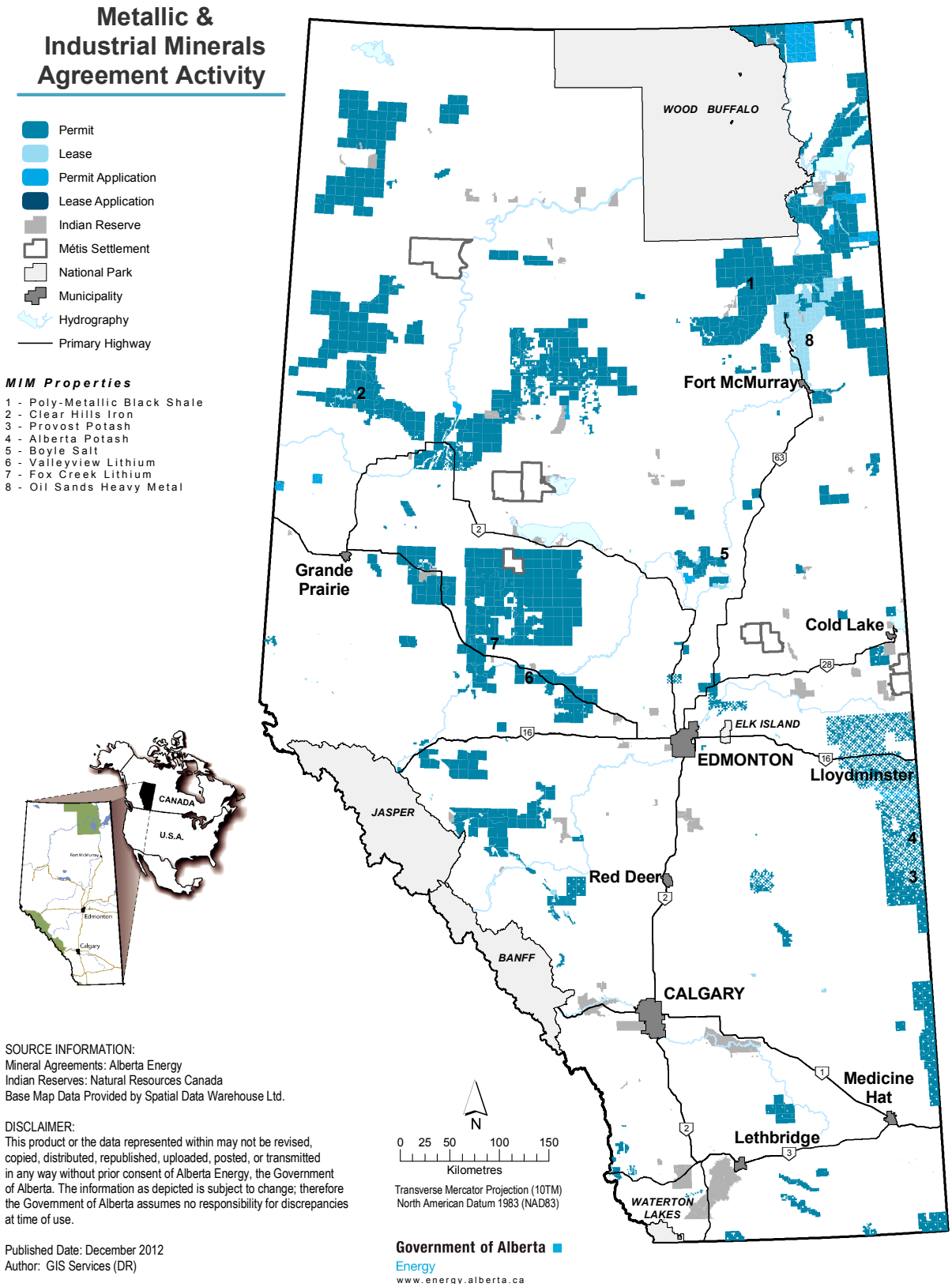


Figure 7. A map of Alberta showing metallic and industrial mineral tenure activity as of December, 2012. The numbers represent a selection of metallic and industrial mineral projects currently ongoing. An interactive, real-time version of this map is available at www.energy.alberta.ca/OurBusiness/1072.asp

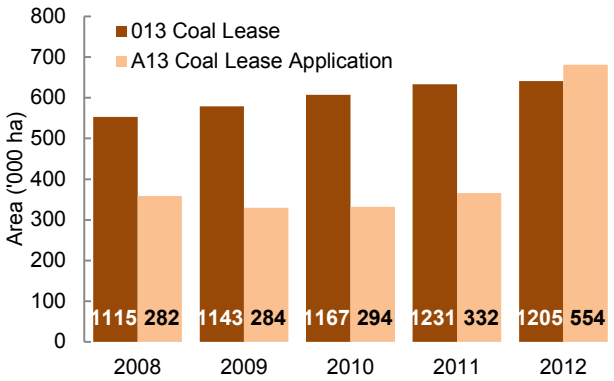


Figure 8. A bar graph with the total area of coal leases and lease applications from 2008 through 2012 (each year is October 1 through September 31). Numbers at the base of the bars indicate the number of individual leases or applications.

2012 coal exploration highlights

While the number and area of coal leases in Alberta remained similar from 2011 to 2012, there was a 67% increase in the number of coal lease applications and an 86% increase in area under application for coal leases (Figure 8). The majority of the applications are within areas that are classified as coal category 2 or 3 under *A Coal Development Policy for Alberta*, within the Foothills and Mountain regions of the province. This area contains Alberta's mineable bituminous coal reserves, which have been of increasing interest in international markets (see Figure 9).

Along with currently developing their Vista project (see description below), Coalspur Mines Limited (*www.coalspur.com*) has continued exploration on Vista South and Vista Extension, which are adjacent to the main Vista project. With new drilling on the Vista South, Coalspur increased their Measured and Indicated resources to 471 million tonnes (Mt) and Inferred resource to 605 Mt. In July 2012, they released a scoping study that outlined the potential for an underground long wall mine on the Vista Extension. Initial estimates at the Vista Extension include a 174 million tonne measured and indicated resource and 969 million tonne inferred resource. It sits on the same geological trend as Vista, so Coalspur expects the coal quality to be of similar quality.

Coal Valley Resources is working toward expansion of their current operations at the Coal Valley mine (Figure 9).

Black Eagle Mining has begun preliminary work on their Blackstone property in the Nordegg area. Their intent is to develop a metallurgical coal mine and export their product.

Mine activities – coal

Production. Every year, approximately 30 million tonnes of coal is mined in Alberta. Total production was down by 2.5 million tonnes from 2011, mostly due to a decrease in subbituminous coal production (Tables 9 and 10). Approximately 75% of the total coal production is subbituminous coal from seven mines in the Plains region of Alberta, and is used primarily for domestic electricity generation. 54% of Alberta's electricity was produced by coal-fired generators in 2011 [4]. The other 25% of total production is bituminous coal produced from four mines in the Foothills and mountain region of the province, and is exported for thermal or metallurgical use. A list of active coal mines is provided in Table 11.

Royalty. Royalties from subbituminous coal has increased over the last five years due to an increased proportion of the subbituminous production from Crown-leased coal. No royalty is collected on coal produced from privately held, or freehold, mineral rights.

[4] Alberta Utilities Commission

Subbituminous coal royalty

Year	Production (t)	Crown portion	Royalty ($)
2008	25,778,842	44%	$6,173,892
2009	23,573,837	40%	$5,225,591
2010	23,583,193	43%	$5,604,637
2011	24,938,975	59%	$8,124,111
2012	22,483,777	60%	$7,463,258

Table 9. The total production and royalty collected for 2012 and the previous four years, for subbituminous coal. Royalty is only payable to the Crown for the portion of coal produced from Crown leases. Each year period is from October 1 to September 31.

Bituminous coal royalty

Year	Production (t)	Royalty ($)
2008	6,855,259	$22,690,915
2009	6,539,159	$28,199,060
2010	7,808,400	$20,628,221
2011	6,898,123	$12,325,969
2012	6,805,148	$8,892,626

Table 10 . The total production and royalty collected for 2012 and the previous four years, for bituminous coal. Each year period is from October 1 to September 31.

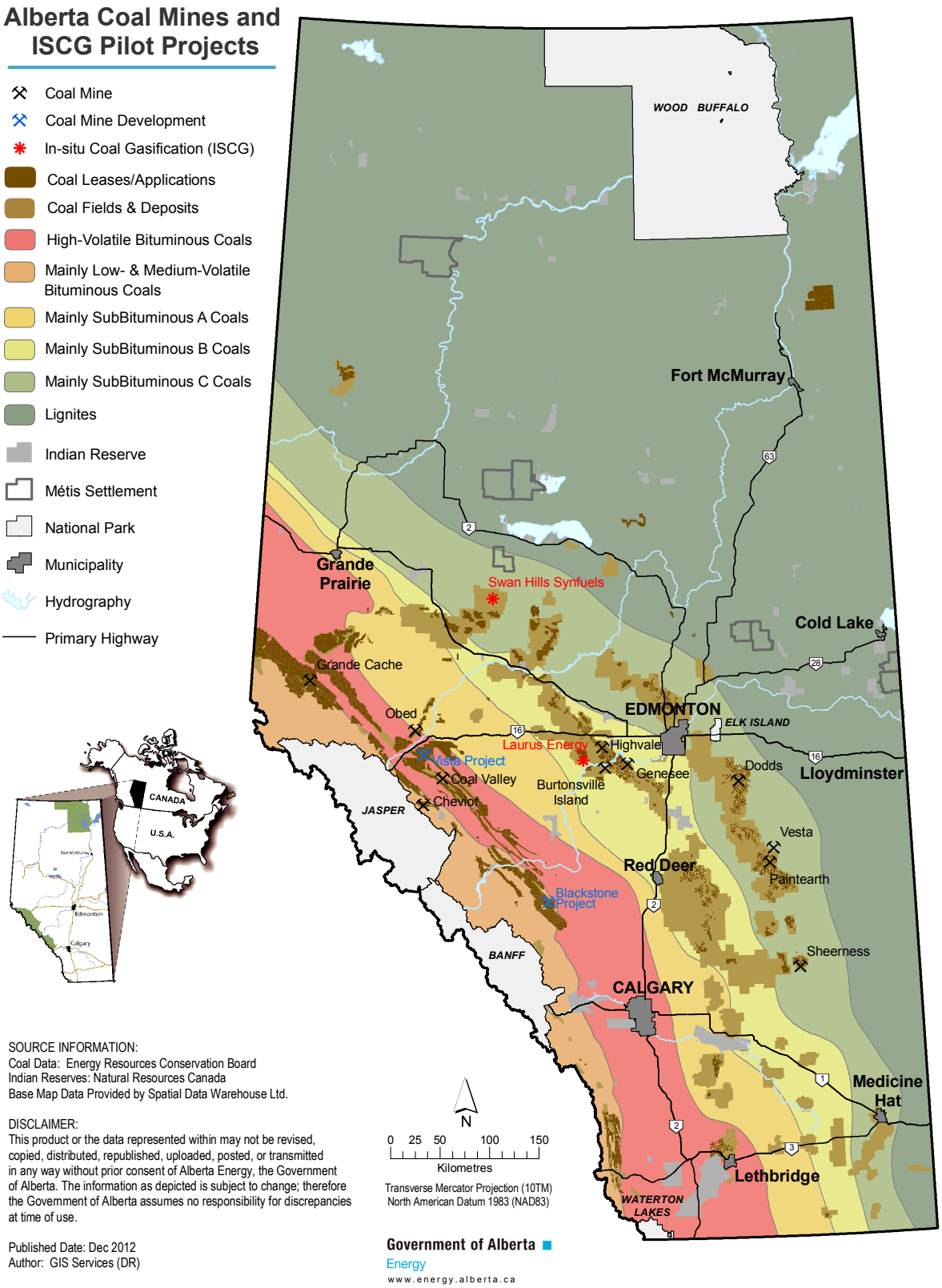


Figure 9. A map of Alberta showing coal tenure activity (dark brown) as of December, 2012. Coal fields (light brown) and approximate coal rank distribution (coloured bands) are also shown. An interactive, real-time version of the coal tenure on this map is available at www.energy.alberta.ca/OurBusiness/1072.asp

Mine/Quarry	Commodity	Location	Operator
Burtonsville	Coal - Subbituminous	Burtonsville	Keephills Aggregate Company Inc.
Calling Lake	Salt	North of Athabasca	Calcium Inc.
Cardinal River	Coal - Bituminous	Hinton	Teck Coal Ltd.
Clearwater	Limestone	Rocky Mountain House	Burnco Rock Products Ltd.
Coal Valley	Coal - Bituminous	Edson	Coal Valley Resources Ltd.
Cougar Ridge	Limestone	Rocky Mountain House	Prairie Creek Quarries Ltd.
Exshaw	Limestone	Exshaw	Lafarge Canada Ltd.
Fish Creek	Limestone	Nordegg	Graymont Western Canada Inc.
Fort McMurray West	Limestone	Fort McMuray	Suncor Energy Inc.
Gap	Limestone	Exshaw	Graymont Western Canada Inc.
Genesee	Coal - Subbituminous	Warburg	Prairie Mines and Royalty Ltd.
Grande Cache	Coal - Bituminous	Grande Cache	Grand Cache Coal Corporation
Highvale	Coal - Subbituminous	Seba Beach	Transalta Generation Partnership
McLeod	Limestone	Cadomin	Lehigh Hanson Materials Ltd.
Mitsue	Salt	Slave Lake	Tiger Calcium Services Inc.
Muskeg	Limestone	North of Ft McMurray	Hammerstone Corporation
Obed Mountain	Coal - Bituminous	North of Hinton	Coal Valley Resources Ltd.
Paintearth	Coal - Subbituminous	Forestburg	Alberta Power (2000) Ltd.
Peace River Silica	Silica Sand	Peace River	Contractors Leasing Corp.
Riverview	Salt	Riverview	The Canadian Salt Company Ltd.
Rundle Stone	Dolomitic Siltstone	Canmore	Kamenka Quarries Ltd.
Seebe	Shale	Kananaskis	Lafarge Canada Ltd.
Sheepcreek	Sandstone	Grande Cache	Grand Cache Coal Corporation
Sheerness	Coal - Subbituminous	Hanna	Alberta Power (2000) Ltd.
Sprayfalls	Sandstone	Exshaw	Thunderstone Quarries Ltd.
Steepbank	Limestone	North of Fort McMurray	Hammerstone Corporation
Summerview	Sandstone	Pincher Creek	Lambert & Co.
Summit Lake	Limestone	Coleman	Graymont Western Canada Inc.
Vesta	Coal - Subbituminous	Cordel	Alberta Power (2000) Ltd.
Vicory	Sandstone	Coleman	Pat Dwyer Construction Inc
Yamnuska	Sandstone	Kananaskis	Lafarge Canada Ltd.

Table 11. A table of the active coal mines and metallic and industrial mineral quarries in Alberta. Mines and quarries are considered active if they have reported production in since September 31, 2011.

There was a significant decrease in the bituminous coal royalty collected, from 2009 through 2012, due to a decrease in the second tier royalty collected. First tier royalty for bituminous coal is 1% on the mine mouth revenue and is collected on all production throughout the life of a mine. Second tier royalty is an additional 13% of the net revenue; it is only collected after a mine has reached payout status (i.e. paid off the initial capital expenditure) and fluctuates with the revenue, which is dependent on production costs.

There are two royalty regimes for coal in Alberta (Table 12). The two systems are divided regionally, which effectively divides them by coal grade: subbituminous or bituminous. Royalties are only collected on Crown-owned coal; if a mine is producing both Crown and freehold coal, royalty is only payable for the coal mined from within Crown leases.

Coal from within the Plains region (subbituminous coal) has a flat-rate royalty that is adjusted using a Crown Royalty Adjustment Factor (CRAF), which is set each

year. The CRAF for 2013 has been renewed at the same rate as 2012, keeping the royalty on subbituminous coal at $0.55/tonne.

Mountain and Foothills coal (bituminous coal) has a two-stage system for royalties. Before a mine has paid off the capital expenses for mine development and construction, the royalty is 1% of the mine mouth revenue. After a mine has reached payout, they must pay aggregate of 1% of mine mouth revenue and 13% of net revenue.

Development. The past year saw continued work on one new mine development and one current mine expansion. The Vista project moved closer to construction and the Coal Valley mine added to their licensed mine area and furthered work to expand to include the Robb Trend to the east of their current operations.

Coal Valley

In April 2012, Coal Valley Resources Incorporated (*www.sherrit.com*) entered into the regulatory process by submitting an Environmental Impact Assessment (EIA) report to the Energy Resources Conservation Board (ERCB) and Alberta Environment and Sustainable Resource Development (ESRD) for a major expansion of their Coal Valley mine (Figure 10). The planned expansion is onto the Robb Trend, which is to the east and adjacent to the current mine area. The Robb Trend will make an additional 177.5 million tonnes available to be mined and will extend the mine life until 2038. Coal Valley proposes to mine the Robb Trend using both dragline, where feasible, and truck and shovel methods.

If all approvals are received as scheduled, Coal Valley plans to begin preparation and access road construction at the end of 2013 and mining activities will commence late in 2014 or early in 2015.

The geology of the Robb Trend is similar to what is being mined in the current Coal Valley mine operations. The coal zone is Tertiary in age and within the upper section

Figure 10. A dragline working at the Coal Valley mine, near Hinton. Photo courtesy of Sherritt Coal.

Coal royalty rates

Subbituminous coal	$0.55 per tonne	
Bituminous coal	Pre-payout	1% mmr[a]
	Post-Payout: sum of	1% mmr and 13% nr[b]

[a]mmr: mine mouth revenue

[b]nr: net revenue

Table 12. Alberta's coal royalty rates.

of the Coalspur Formation. The zone, which ranges in thickness from 180 to 290 metres, contains six individual coal seams. The uppermost Val d'Or seam is the primary target for the Robb Trend; it has an average thickness of 8.9 metres.

Coal Valley continued exploration at their Coal Valley mine and received a new coal mine licence from the ERCB for their Yellowhead Tower mine area.

Mine 14

Milner Power Incorporated (*www.maximpowercorp.com*) has continued work on its Mine 14 project adjacent to the town of Grande Cache. They received a Coal Mine Permit from the ERCB in 2009 and have yet to receive full approval to start full mine development. The project contains approximately 13 million tonnes (non-NI 43-101 compliant) of low volatile, bituminous coal.

Vista

The largest coal development project in 2012 was Vista thermal coal project, owned and operated by Coalspur Mines Limited (*www.coalspur.com*). Coalspur has begun the application process for approvals to begin mine development at Vista. They have also completed a feasibility study on the property and begun detailed engineering for mine development (Figure 11).

Vista is a bituminous thermal coal project located to the west of Hinton, Alberta. It is within an established coal mining district in the Foothills region of Alberta, between the currently operating Obed Mountain, Coal Valley and Cardinal River mines (see Figure 9).

Mine development is targeting several gently dipping coal seams of the upper Cretaceous-Tertiary Coalspur and Paskapoo Formations. The company released a bankable feasibility study in January 2012, which defines a 30 year mine life producing 11.2 million tonnes per year of marketable clean coal (from 20.4 million tonnes per year run of mine coal) at peak production. To accommodate

Figure 11. A photo of a sonic rig at Coalspur's Vista project, from their 2012 drilling program. The drill is coring geotechnical holes for the fines settiling pond. It was the final drilling in preparation of detailed engineering and design for the proposed mine development. Photo courtesy of Coalspur Mines.

the production amount, an agreement for an addition 5 million tonnes per year with Ridley Terminals was announced. This brings the total port agreement to a maximum of 13.5 million tonnes per year.

Originally scheduled to reach maximum production by 2018, Coalspur announced a revised production plan in the third quarter of 2012. The new plan prolongs the ramp up to full capacity into 2019, which Coalspur hopes will substantially reduce the initial capital expenditure. Production is slated to begin in 2015 if all approvals are granted and construction goes as planned.

An Environmental Impact Assessment (EIA) was filed with ESRD in the spring of 2012. The EIA, and other related documents, will be used by ESRD to review permit applications under several Acts, including the Environmental Protection and Enhancement Act, Water Act, and Public Lands Act.

A Coal Mine Permit has been in place over the property site since 1983, for the McLeod River Project. After Coalspur's purchase of the property, the Energy Resources Conservation Board (ERCB) approved a transfer of the coal mine permit (Mine #1815), and other approvals, to Coalspur in May 2011. The current application with the ERCB includes amendments to the mine permit and coal processing plant approval and new mine licences for eventual mine operation.

The planned development at Vista is forecast to add approximately 500 full time jobs at the mine and increase the population of Hinton by 2200 residents. The initial life of the mine is anticipated to be 20 years with the potential for more, depending on post-Vista development.

ISCG

In Situ Coal Gasification (ISCG) is an emerging technology. Alberta has one approved pilot project near Swan Hills, operated by Swan Hills Synfuels (*www.swanhills-synfuels.com*). Swan Hills began their pilot in 2009.

Both Laurus Energy Incorporated (*www.laurusenergy.com*) and New Coal Energy Pty. Limited (*www.newcoalenergy.com.au*) have proposed ISCG projects in the Drayton Valley and Pine Creek areas, respectively. Neither company has received approval to begin any gasification activity.

Updates

Coal and Mineral Development Branch (CMD)

Energy and Mines Ministers' Conference (EMMC). CMD is active with the EMMC, representing Alberta on the intergovernmental sub-committees for *Addressing Barriers to the Adoption of Green Mining Innovation in Canada*, the *Mining Sector Performance Report*, and *Advanced Minerals Projects Inventory*. For more information regarding EMMC, please see page 18.

Roundup and PDAC. Representatives from the Coal and Mineral Development (CMD) branch of Alberta Energy hosted booths at the Mineral Exploration Roundup in Vancouver and the Prospectors and Developers Association of Canada convention in Toronto, in 2012.

Provincial/Territorial Mining Rights Committee (PTMRC). CMD represents Alberta on the (PTMRC). With a representative from every jurisdiction in Canada, the committee meets once a year to discuss mineral rights. It allows all the jurisdictions to discuss and learn about the differences in tenure regimes across the country and discuss solutions to tenure issues that arise. There are significantly different tenure regimes across Canada, so the PTMRC provides an efficient forum to see the pros and cons of each.

In Situ Coal Gasification (ISCG) Workshop. CMD staff attended a workshop of the Underground Coal Gasification Network (*ucg.coalconferences.org/ibis/UCG2/home*) in Banff. The workshop brought together international ISCG experts to discuss a number of issues with regard to ISCG: status (Canada and globally), regulatory issues, modeling, environmental risks, project development, engineering and geosciences.

China Mining Conference. CMD staff was invited to join the Canadian delegation attending the 'China Mining Conference and Exhibition' in Tianjin and the 'Canadian Mineral Investment Forum', in Beijing, China.

One representative attended as an observer with the intention of considering full participation in 2013 that would include a tradeshow information booth, technical presentations and involvement of Alberta based companies interested in promoting their coal/mineral properties to Asian investors. While participating as an observer, attendance at the conference provided an opportunity to give two presentations namely: *Coal Development & Mineral Exploration in Alberta*, *Canada* and *Mineral Tenure in Alberta, Canada*. Other Canadian jurisdictions participating at the Conference and Investors Forum included British Columbia, Saskatchewan, Yukon, Quebec, and Newfoundland and Labrador. The conference is held in early November each year. For more information about the conference go to: *www.china-mining.org/en/index.aspx*

Mineral Assessment Reports

CMD continued with its mineral assessment report scanning project through 2012. The goal is to have all assessment reports scanned and available to be downloaded from a searchable online database. In the short term, the reports are scanned and available on request. All assessment reports past their confidentiality period are available to the public, upon request to the Department. Following a request, a digital copy of the report will be forwarded to the applicant. Please check the Alberta Energy website for updates.

A revised guideline for writing mineral assessment reports was prepared in 2012; it is available for download from the Alberta Energy website. The guideline covers the administrative and technical requirements for assessment reports as well as the allowable and non-allowable costs. The new guideline does not introduce any new rules or regulations, but clarifies existing rules.

A half-day mineral assessment report workshop was given by CMD staff, in October, as part of a workshop series organized by the Calgary Mineral Exploration Group (*www.meg.calgary.ab.ca*). The course provided an overview of the administrative and technical requirements for mineral assessment reports in Alberta. If there is sufficient interest, CMD will look at providing the course again in Edmonton and/or Calgary.

Legislation

Metallic and industrial minerals

During 2012, CMD engaged an independent consultant to review the current regulatory process in place for the potential development of a metallic mine. The review's intent is to provide a detailed outline of the regulatory process currently in place, which a potential metallic mine development would follow. Because there has never been a metallic mine permitted in Alberta, the review also identifies any existing gaps in the process. The findings will be used by the Department to fill regulatory gaps and to ensure any potential metallic mineral developments can be efficiently reviewed and regulated.

The review included an examination of the administrative processes within Alberta Energy as well as other ministries and boards involved with metallic and industrial mineral approvals; this includes primarily ESRD and the NRCB.

The report also compares Alberta's metallic and industrial minerals royalty rates with other jurisdictions in Canada. The current royalty rates for metallic and industrial minerals were set in 1993.

Coal

Alberta Energy has identified developing a Coal Policy Framework as a departmental corporate priority for the 2012-2013 fiscal year. The initiative will evaluate the resource development context for coal in Alberta to ensure any new policy is aligned with current and future anticipated coal sector dynamics. A separate project under the framework will develop appropriate mineral tenure and other policies to address in situ coal gasification development in Alberta.

New publications

AGS publications released in 2011 and 2012

Alberta Geological Survey publications are available on their website: *www.ags.gov.ab.ca*.

Northern Alberta Kimberlite Province: The First 20 Years. Eccles, D.R., ERCB/AGS Bulletin 65, November 2011.

Specialty Metal Occurrences in Northern Alberta. Prior, G.J. and Weiss, J.A., ERCB/AGS Information Series 142, 2012.

Edmonton-Calgary Corridor Groundwater Atlas. Barker, A.A., Riddell, J.T.F., Slattery, S.R., Andriashek, L.D., Moktan, H., Wallace, S., Lyster, S., Jean, G., Huff, G.F., Stewart, S.A. and Lemay, T.G. ERCB/AGS Information Series 140, 2011.

Eocene Potassic Magmatism of the Milk River Area, Southern Alberta (NTS 72E) and Sweet Grass Hills, Northern Montana: Overview and New Data on Mineralogy, Geochemistry, Petrology and Economic Potential. Rukhlov, A.S. and Pawlowicz, V.H., ERCB/AGS Open File Report 2012-01, 2012.

Magmatism and Metallic Mineralization of the Rocky Mountain Fold-and-Thrust Belt, Southwestern Alberta (NTS 82G, 82H and 82J): Mineralogy, Geochemistry and Petrology of Selected Occurrences. Rukhlov, A.S. and Pawlowicz, J.G., ERB/AGS Open File Report 2011-11, 2011.

Geological Introduction to Lithium-Rich Formation Water with Emphasis on the Fox Creek Area of West-Central Alberta (NTS 83F and 83K). Eccles, D.R. and Berhane, H., ERCB/AGS Open File Report 2011-10, 2012.

Review of Metallic Mineralization in Alberta with Emphasis on Gold Potential. Rukhlov, A.S., ERCB/AGS Open File Report 2011-01, 2011.

Other publications

Alberta's 2 Trillion Tonnes of 'Unrecognized' Coal. Richardson, R.J., a report for Alberta Innovates Energy and Environment Solutions, 2010. *<http://eipa.alberta.ca/media/43006/alberta_2_trillion_tonnes_coal.pdf>*

Coal Association of Canada – Economic impact analysis of the coal mining industry in Canada. Pricewaterhouse Coopers, October 31, 2012. *<www.coal.ca/blog/major-cash-planned-for-mines-industry>*

Mining in Alberta; the potential of the wild rose. Engineering and Mining Journal, p. 57-72, April 2012. *<www.e-mj.com/index.php/magazine/archive-edition#>*

Land-use planning

Alberta Land Stewardship Act (ALSA)

The ALSA was passed June 4, 2009 and is the legislative mechanism to implement and support the development of regional plans under the Land-use Framework (LUF; *www.landuse.alberta.ca*).

To clarify the intent of the legislation, and to reinforce the Government of Alberta's commitment to respecting the property rights of Albertans, the ALSA was amended on May 10, 2011.

Land-use Framework

A key strategy of the LUF is the development of seven regional land use plans (Figure 12). Along with environmental monitoring and regulatory enhancement, regional planning is a cornerstone of the world-leading resource system that the Government of Alberta is building in Alberta. This more integrated and coordinated resource system will deliver the best economic, environmental and social benefits for Albertans today and improve competitiveness and certainty for industry for years to come.

Lower Athabasca Regional Plan

The Lower Athabasca Regional Plan (LARP), the first regional plan developed under the LUF, was publicly released in August 22, 2012 and the regulatory components of the plan took effect on September 1, 2012. The LARP is a forward-looking, 50-year blueprint that provides the strategic direction needed to enhance environmental management in the Lower Athabasca Region which hosts the Athabasca Oil Sands Area, the main economic driver for the region and the province.

The Government of Alberta consulted and received input and feedback on the development of the LARP from more than 10,000 Albertans – including individuals, Aboriginal peoples, industry, municipalities, environmental organizations and other stakeholders - over a period of more than three years.

LARP questions?

For more information regarding the LARP (or any other land-use planning), contact:

Land-use Framework Regional Planning
780-427-9077

The LARP addresses economic, environmental and social aspects:

- Economically, the LARP provides certainty for industry in the development of resources – companies know where they can and cannot operate with clear rules established. While oil sands are the predominant energy industry in the Region, the LARP addresses the need to ensure opportunities for continued electrical and natural gas development along with mineral exploration, development and extraction. Alignment of policy within and across regions will not only facilitate access to these resources, but will ensure a positive investment climate.
- Environmentally, the LARP establishes six new conservation areas, increasing the total conserved land in the region to two million hectares (22 per cent of the region) – an area three times the size of Banff National Park. The LARP also holds Government accountable for the development of management frameworks for groundwater, surface water quality, biodiversity and land which define a number of limits and triggers.
- Socially, nine new provincial recreation areas are established – with access to campsites, trails, boat

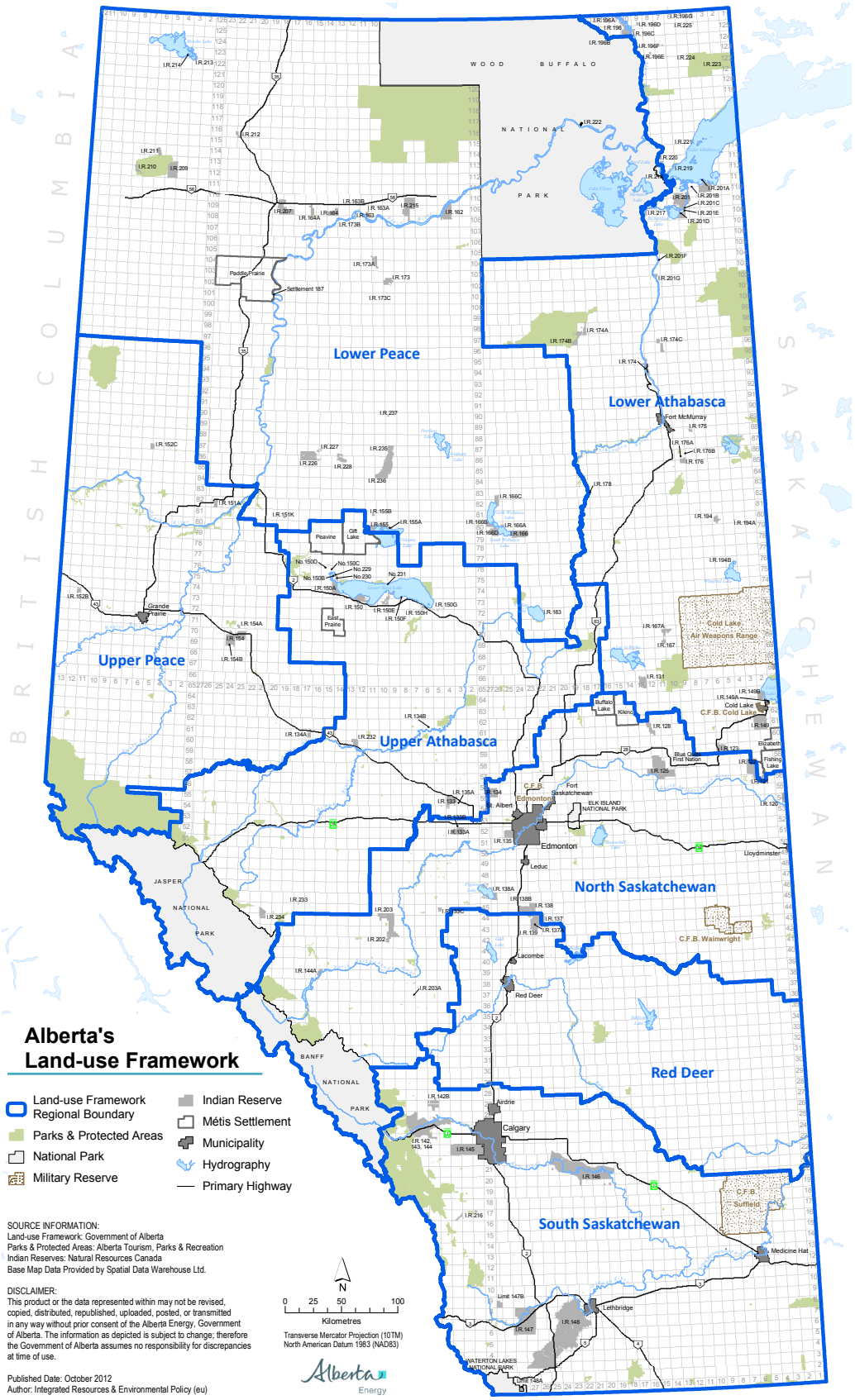


Figure 12. A map of Alberta, showing the boundaries of the regional planning areas associated with Alberta's Land-use Framework.

docks, etc. – for Albertans to enjoy year round. The LARP also commits to providing land for urban development that helps support growth around Fort McMurray and enables a long-term approach to future infrastructure development.

Other regional plans

Consultations on the South Saskatchewan Regional Advisory Council's *Advice to the Government of Alberta for the South Saskatchewan Regional Plan* (SSRP) occurred in late 2012. Development of the draft SSRP will follow in early 2013. Albertans, including industry, will have an opportunity to provide feedback on the draft SSRP before it is approved by Government.

For questions or more information about Land-use Planning in Alberta, please see the contact information on te previous page.

Energy and Mines Ministers' Conference

The annual Energy and Mines Ministers' Conference (EMMC) is an opportunity for federal, provincial and territorial ministers to discuss challenges facing the mining industry. The meeting is an opportunity for governments to provide coordinated support for the mining sector. Governments may invite industry to participate in their delegations, with industry organized events running concurrent to EMMC. In 2013, the conference will be held in Yellowknife, Northwest Territories.

In 2012, EMMC advanced a number of important mining initiatives:

Green Mining Initiative [5] – Ministers approved an action plan to bolster innovation in the Canadian mining sector by reducing barriers associated with regulatory decision-making that impede the adoption of green mining technologies.

Mining Sector Performance [6] – The ministers discussed the preparation of the 2013 edition of the *Mining Sector Performance Report*, which will provide an evidence-based analysis of the Canadian mining sector's economic, environmental and social performance over a period of 10 years. They endorsed a conceptual framework and a list of performance indicators for the updated report, which updates the one released by mines ministers in 2010. A new performance report is due to EMMC every three years; the next one will be submitted at the 2013 meeting.

Intergovernmental Geoscience Accord – Federal, provincial and territorial geoscience agencies responsible for delivering geoscience programs and providing essential geological information and expertise agreed to a further five-year commitment to work collectively to increase core public geoscience knowledge.

Regulatory Reform – The ministers received a report on implementing improvements to the efficiency and effectiveness of the regulatory review process for major projects. They recognized the important progress made in regulatory reform and the opportunity to capitalize on measures in the Government of Canada's Responsible Resource Development plan in order to reduce regulatory duplication and achieve the objective of "one project, one review" in a clearly defined time frame, while maintaining the highest possible standard for protecting Canadians and the environment.

Defining the Opportunity Report [7] – Canada's enormous natural resource endowment represents a critical component of our current and future economic prosperity. The ministers received a report entitled *Defining the Opportunity*, which outlines the economic impact of the energy and mining sectors in Canada.

Figure 13. An aerial view of the Genessee subbituminous coal mine, near Wabamun. Photo courtesy of Sherritt Coal.

[5] Regulatory Barrier Identification and Analysis – Green Mining (May 2012).
www.nrcan.gc.ca/minerals-metals/publications-reports/4315

[6] Mining Sector Performance Report 1998 – 2008 (September 2010).
www.nrcan.gc.ca/minerals-metals/publications-reports/3398

[7] Defining the Opportunity: Assessing the Economic Impact of the Natural Resources Sector (September 2012).
www.scics.gc.ca/english/conferences.asp?a=viewdocument&id=1907

About Alberta's regulatory system

The Crown owns 81% of the mineral rights in Alberta. The other 19% are *Freehold* mineral rights and are owned by individuals, companies or the federal government on behalf of First Nations. The Coal and Mineral Development Branch is responsible for the administration of the Crown's mineral rights for metallic and industrial minerals and coal.

Coal and Mineral Development issues a variety of agreements, depending on the specific substance and/or activity a client wishes to pursue. Each agreement type is defined and governed through the Alberta's *Mines and Minerals Act* (RSA 2000, M-17), the *Metallic and Industrial Minerals Tenure Regulation* (AR 145/2005) and the *Ammonite Shell Regulation* (AR 152/2004).

Permit

Metallic and Industrial Mineral (MIM) permits are issued for the exclusive right to explore for metallic and industrial minerals in the subsurface and remove samples for exploration purposes. No annual rent is payable on a permit; to keep a MIM permit, the holder must perform a specified amount of exploration work every year on the lands. The permit holder is required to submit an assessment report every two years outlining the dollar amount spent on exploration and the results obtained from those expenditures. Permits can be held for a maximum of 14 years.

Permits are not issued for coal in Alberta. A coal lease or lease application is sufficient for tenure rights while performing a coal exploration program. MIM permits are governed by the *Metallic and Industrial Minerals Tenure Regulation.*

Statistics for the number of permits and permitted area, for the previous five years, are provided in Figure 1. While the total number of permits decreased, the total permitted area remained the same in 2012 as 2011. The numbers and area of permits fluctuates from year to year because of the 2-year assessment reporting periods. The requirement for constant work on permits causes permits to be returned back to the land bank on shorter intervals.

Lease

Leases are issued for both MIM and coal and convey the exclusive right to win, work and recover MIM or coal. To obtain a MIM lease, an applicant must hold a MIM permit for at least two years on any lands being applied for lease and satisfy the department there is minable resource at the location of the lease. All leases are issued only after referral to the Crown Mineral Disposition Review Committee (CMDRC) to ensure there are no environmental, land-use or other such issues.

Leases are granted for a 15 year term and are renewable as long as the land is being worked. MIM leases are issued as per the *Metallic and Industrial Minerals Tenure Regulation*. Coal leases are issued under the *Mines and Minerals Act* and *A Coal and Mineral Development Policy for Alberta (1976)*. Annual rental of $3.50 per hectare per year is charged annually for leases.

Statistics for the number of leases and leased area, for the previous five years, are provided in Figure 2 (MIM) and Figure 8 (coal).

Licence

Metallic and industrial mineral licences are issued for the purpose of recreational placer mining. They convey the right to win, work and recover metallic and industrial minerals through placer mining. Each licence is valid for a 5 year term. A licence does not provide tenure rights or exclusive rights to any substance. Because it does not provide tenure rights, each placer mining operation can only stay in a spot for a total of fourteen days at which point it must be moved to a new location.

Statistics for the number of licences issued over the past five years are provided in Figure 4. The number of active licences almost doubled in 2012; 381 new licences were issued in the past year. The reason for this increase is unclear, but the high price of gold and the presence of placer mining in reality television may be contributing factors.

Secondary mineral lease

Secondary Mineral Leases grant the right to win, work and recover metallic and industrial minerals through a secondary recovery operation. A secondary mineral lease is generally issued to the operator of a gravel pit that wishes to process the sand and gravel to extract gold and/or silver. It is for a term of 5 years and may be renewed for further 5 year terms if proper approval for a surface operation is renewed. At the end of 2012 there were only two secondary mineral lease agreements.

Special mineral lease

Special Mineral Leases are issued for underground storage caverns and other non-mining uses of Crown-owned minerals. They are issued through an Order in Council under the *Mines and Minerals Act*. Special mineral leases are issued for a 15 year, renewable, term; an annual rental, currently $12.50 per hectare must be paid to maintain a special mineral lease.

Statistics for the number and area of special mineral leases, for the previous five years, are provided in Figure 14.

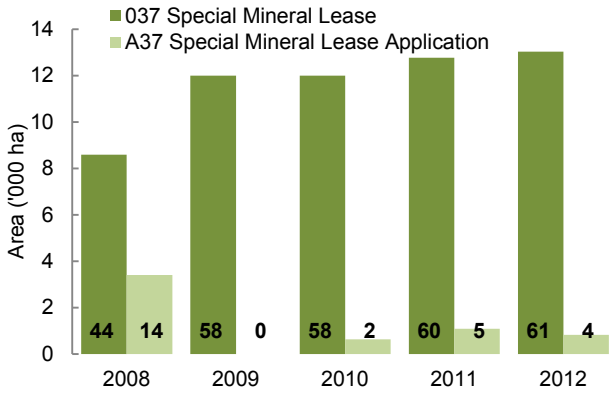


Figure 14. A bar graph with the total area of special mineral leases and special minera lease applications from 2008 through 2012 (each year is October 1 through September 31). Numbers at the base of the bars indicate the number of individual leases or applications.

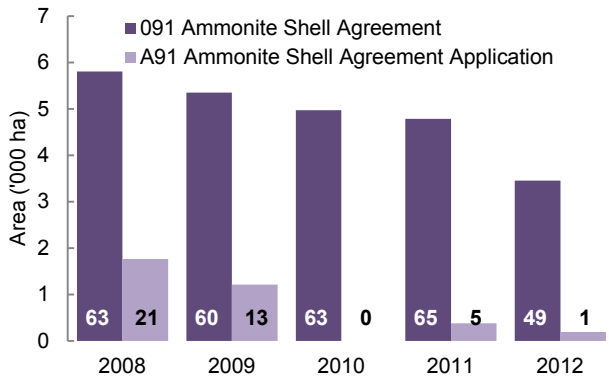


Figure 15. A bar graph with the total area of ammonite shell agreements and applications from 2008 through 2012 (each year is October 1 through September 31). Numbers at the base of the bars indicate the number of individual agreements or applications.

Ammonite shell agreement

Ammonite Shell Agreements give the exclusive right to recover ammonite shell. The holder of an ammonite shell agreement must also apply for an exemption from the Historical Resources Act because ammonite shell is a fossil and is, therefore, the property of the Crown. For an ammonite shell agreement to remain valid, the Historical Resources Act exemption must be held for the duration of the agreement. Ammonite shell agreements are good for an initial 15 year term and renewable for further 5 year terms.

Ammonite shell activity and statistics for the number and area of ammonite shell agreements, for the previous five years, is provided in Figure 15

Interactive maps

There are three interactive maps available on the Alberta Energy website (*www.energy.alberta.ca/OurBusiness/1072.asp)*: coal, metallic and industrial minerals and ammonite shell. All of the maps are updated nightly and contain all tenure information for each corresponding mineral type. They are searchable and detailed reports can be generated for the land, description and contact information for each agreement and restriction.

A unique treasure

The wild rose may be Alberta's best-known emblem, but a recent addition to the Royal Alberta Museum collection is giving another important emblem its time in the spotlight. In September 2012 the Royal Alberta Museum, with assistance from the Royal Tyrrell Museum collected a 6690 kg tree stump from the shore of the Athabasca River south of Fox Creek.

In 1977, petrified wood was designated the official stone of Alberta. Petrified wood is a common part of any young Albertan's rock collection and small pieces can be found throughout the province, often in gravel deposits. However, large, intact and well-preserved tree stumps are rare. The spectacular specimen recently acquired by the Museum meets all of these criteria. What's more, it provides a glimpse of Alberta's landscape around 60 to 65 million years ago, shortly after the extinction of the dinosaurs.

The petrified stump is on display at the Royal Alberta Museum until April 2013. www.RoyalAlbertaMuseum.ca

Appendix

This appendix is a list of all new assessment reports that were reviewed and accepted by Alberta Energy in 2011 and 2012. All of the reports are subject to a one-year confidentiality period and are available after this time. To inquire about a report or request a copy of an assessment report, please contact the Coal and Mineral Development Branch.

2011 assessment reports

Report number	Project name	Description	NTS area
20110001	Northwest Alberta	Gold exploration near Grande Prairie, west-central Alberta.	83M-NW
20110002	Calling Lake	Diamond and gold exploration near Athabasca, central Alberta.	83P-SW
20110003	Fox Creek	Lithium exploration near Fox Creek, west-central Alberta.	83F-NE; 83K-SE
20110004	Fox Creek	Lithium exploration near Fox Creek, west-central Alberta.	83F-NE,NW; 83K-NW,SE,SW
20110005	Peace South	Lithium exploration near Peace River, west-central Alberta.	83N-NW
20110006	Valleyview	Lithium exploration near Valleyview, west-central Alberta.	83K-NW; 83N-SW
20110007	Grassland Quartz	Assessment of shale quality near Grassland, east-central Alberta.	83I-NE
20110008	Chinchaga	Potash exploration near Ft. McKay, northeast Alberta.	84E-SW; 84J-NW,SW
20110009	Panny River	Exploration in northeast Alberta.	84G-NE
20110010	Firebag River	Gypsum exploration in the Ft. McKay area, northeast Alberta.	74E-NW,SW
20110011	Provost Potash	Potash exploration near Provost, southeast Alberta.	73D-SE
20110012	Diamond	Diamond exploration near Peerless Lake, north-central Alberta.	84B-NE
20110013	Smoky the Bear	Diamond exploration near Red Earth Creek, northern Alberta.	84B-NE,SE
20110014	Ualta	Uranium exploration in the Medicine Hat area, southern Alberta.	82H-NE,SE
20110015	Whiskey Gap	Uranium exploration in southern Alberta	82H-SE,SW
20110017	Pembina	Gold exploration in unconsolidated sediments along the Brazeau river in the Rocky Mountain foothills.	83C-NE,NW; 83F-SE; 83G-SW
20110018	Lost Lemon Mine	The Lost Lemon mine, southwest Alberta.	82G-NE; 82J-SE
20110019	Limestone Range	Limestone quality near Rocky Mountain House, west-central Alberta.	82O-NW; 83B-SW

2012 assessment reports

Report number	Project name	Description	NTS area
20120001	Rea Uranium	Geophysical exploration for uranium, northeastern Alberta.	74E-NE,SE; 74L-SE
20120002	Smoky River	Metallic mineral exploration near Grande Prairie, west-central Alberta.	83M-SE
20120003	Brazeau	Gold exploration in unconsolidated sediments along the Brazeau river in the Rocky Mountain foothills.	83B-NW; 83C-NE,SE; 83F-SE; 83G-SW
20120004	Marble Mountain	Limestone in the Nordegg area, western Alberta.	82O-NE
20120005	Frontier	Devonian limestone in the Ft. McMurray area, northeastern Alberta.	74E-NW
20120006	Clearwater	Quality and extraction logistics of landscape rocks in the Clearwater area, western Alberta.	82O-NW
20120007	SBH	Poly-metallic shale in the Birch Mountain area, northeast Alberta.	74E-NW,SW; 84H-NE,SE
20120008	Black Butte	An investigation of minette as a source of K, REE or Au.	72E
20120009	Shunda Mountain	Limestone quality near Nordegg, western Alberta.	83C-NE
20120010	Swan Hills	Bentonite exploration in the Swan Hills area, northern Alberta	83A; 83J-NW,SW; 83K-NE,SE; 83N-SE; 83O
20120011	Clear Hills	Iron exploration in the Clear Hills area, northern Alberta.	84D-NE; 84E-SE
20120012	Crooked Rapids	Magnetite exploration in the Athabasca region, northeast Alberta.	74D-NW;SW
20120013	Smoky River	Iron exploration near Grande Prairie, west-central Alberta.	83N-NW
20120014	Botha River	Iron exploration in the Botha River area, west-central Alberta.	84E-NE,SE
20120015	North Peace River	Frac sand exploration in the Peace River area, northern Alberta.	84C-SW
20120016	Angel Wing	The Lost Lemon mine, Crowsnest Pass area, southwest Alberta.	82G-NE
20120017	Crowsnest North	Building stone exploration in the Crowsnest Pass area, southwest Alberta.	82G-NE
20120018	Clearwater	Limestone exploration in the Clearwater range, west-central Alberta.	82O-NW; 83B-SW
20120019	Brazeau Range	Limestone exploration in the Brazeau range, west-central Alberta.	83B-NW
20120020	Southern Alberta Potash	Potash exploration in southeast Alberta.	72L-NE,SE
20120021	Audet Lake	Limestone exploration near Fort Mckay, northeastern Alberta	74E-NE,SE

Back cover: Dragline operating at the Sheerness coal mine. Photo courtesy of Sherritt Coal.

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