Emerging technologies in energy:
Environmental and regulatory considerations
for Western Canada

Lithium

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

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Recent years have seen the emergence of new technologies in energy, driven largely by the global shift away from conventional fossil-fuel energy sources toward low-carbon sources of energy and new means of harnessing them. These emerging technologies include those for geothermal, lithium, and hydrogen resources, which have been the subject of rapid policy and regulatory developments in Canada. Geothermal, lithium, and hydrogen technologies are expected to continue to advance in the coming years, as they are increasingly adopted and implemented in Canada and globally.

The physical setting and resource development experience in Western Canada present tremendous opportunities for meaningful growth in the development of these energy resources. However, as is to be expected with emerging sectors, there are uncertainties with respect to the environmental risks and regulatory frameworks that apply, which considerations and regimes are largely in a state of flux.

Osler's legal experts in conjunction with environmental specialists at Matrix Solutions Inc. have created a three-part series that discusses the current environmental and regulatory considerations in Alberta, British Columbia and Saskatchewan associated with the development of geothermal, lithium and blue hydrogen resources.

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Introduction

Over the last decade, lithium has grown from having primary uses in glass and ceramic manufacturing to its now almost ubiquitous association with lithium-ion batteries. These have emerged as a key component in energy storage applications ranging from small electronic devices through to electric vehicles for decarbonized transportation. They have even been used in grid scale energy storage for load leveling and renewable energy storage. Given this increasingly important role in energy decarbonization, some forecasts suggest that lithium production will need to grow by as much as five times current outputs by 2030 to satiate the surge in demand.[1] Globally, lithium sales in 2018 were approximately US$4 billion and are on track to reach upwards of US$30 billion by 2030.[2] With such a rapid expansion of supply required and relatively slow production scaling, a significant market opportunity exists to capture a portion of this nascent supply chain in North America. In addition to the requisite increase in supply, there exists a strong incentive for diversification of this supply chain for added geopolitical stability. This stems from the extremely concentrated supply chain dominated by Australia and South America for resource production and by China for refinement and battery manufacturing. This call for new and diverse supply is exemplified by the recent declaration by the United States to include lithium in its key strategic minerals deemed essential for future national energy independence and the recently formed Canada-U.S. Joint Action Plan on Critical Minerals Collaboration.

Canada is making advancements to fully quantify and understand its inventory of lithium resources and it is evident that subsurface brines present a potentially unique and accessible resource in jurisdictions with existing oil and gas infrastructure and expertise. Brines enriched with lithium have been identified in Alberta and Saskatchewan with ongoing interest in northeast British Columbia and Manitoba. More than a dozen projects throughout these jurisdictions have now been quantified by National Instrument Standards (NI-43-101) in lithium carbonate equivalent. Notable projects with early-stage pilots include those in central and southern Alberta and in southeast Saskatchewan.

1 Gert Berckmans et al, "Cost Projection of State of the Art Lithium-Ion Batteries for Electric Vehicles Up to 2030" (2017) 10:9 Energies 1314, https://doi.org/10.3390/en10091314;
IRENA, *Electricity Storage and Renewables: Costs and Markets to 2030*, (International Renewable Energy Agency, 2017), https://www.irena.org/publications/2017/Oct/Electricity-storage-and-renewables-costs-and-markets.

2 Brian W. Jaskula, *2017 Minerals Yearbook – Lithium* (U.S. Geological Survey, 2020), https://prd-wret.s3.us-west-2.amazonaws.com/assets/palladium/production/atoms/files/myb1-2017-lithi.pdf.

Process description

Globally, lithium is currently produced from either Australian spodumene ore in open pit hard rock mining operations or through evaporative concentration of enriched brines in Andean salars. Conventional mining for mineral forms of lithium requires heavy machinery to lift and crush ore and the application of high temperatures and pressures and caustic reagents to extract the lithium. Lithium brines in South America are processed using evaporation ponds which require huge tracts of land, are prone to leaks and weather setbacks, and take two years to concentrate before producing lithium products. Canada hosts potential in both mine and brine type deposits, however the brine prospects here differ significantly from their South American counterparts as they exist within sedimentary basins of Western Canada and are often referred to as "petro-lithium brines."

Lithium development is the recovery of lithium from solution in lithium enriched brines or formation waters within oil-bearing geologic reservoirs. Like geothermal energy production, fluids in these formations are highly saline and range from depths of approximately 600 m to greater than 3,000 m below ground surface. These brines occur within reservoirs which currently produce or have produced oil and gas as well as certain formation waters. These brines are lower in lithium concentration (50 – 200 mg/L) than their counterparts in South America (300 – 3,000 mg/L), yet exist in vastly larger volumes which amount to a comparable resource in place. In addition, the technology being developed to process this brine differs from that used for South American brines given that evaporative concentration is not feasible in Canadian climates. The Canadian brine is brought to surface and treated in a central processing plant to concentrate and recover the lithium. Various technologies are being designed and tested for this purpose in Canada with some promising concepts built upon ionic exchange, membrane and nano-filtration, and forms of electrochemical separation, all of which are also considering potential synergies with geothermal energy production. The remaining fluid from processing is strategically reinjected into the source formation to maintain pressure support with special consideration for dilution effects over time.

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Environmental considerations

As with geothermal energy production, the main task when developing a lithium project is to safely drill and complete the necessary wells to the required depths. The potential environmental concerns associated with drilling these wells are comparable to those associated with oil and gas drilling. These concerns are well understood, and it is expected that the existing regulatory frameworks can be adapted as required to manage drilling for lithium development.

Because lithium-bearing formations can be shallower than formations targeted for geothermal development, there is also a higher potential to co-produce lithium from existing oil and gas wells within depleted fields.

Should lithium developers elect to repurpose existing oil or gas wells rather than drill new wells, the environmental liability of the existing infrastructure needs to be understood and managed. Potential issues associated with the ability of the existing liability management frameworks in each province to quantify the lithium asset potential of the infrastructure (in addition to the environmental liability) would need to be addressed.

One other key difference between lithium development and geothermal development is that the lithium is removed from the process when the fluid is brought to surface. To continue to recover lithium in quantities suitable for commercial production, sustaining wells need to be drilled and completed regularly throughout the life of the facility. A full commercial-scale lithium production facility could supply beyond 25,000 tonnes per annum of lithium carbonate equivalent and would theoretically process more than 100,000 m^3 of brine fluid per day from a network of wells. This requirement results in a surface disturbance footprint that is comparable to oil and gas production with many existing fields managing produced waters in these orders of magnitude. It is expected that the existing frameworks that regulate land access and terrestrial environmental effects of oil and gas development in each province can be adapted to consider lithium development.

During operations, one of the main environmental concerns would be the potential for inadvertent brine release. The development would be designed to process brine in a central facility within the well network. Brine would typically be transported in buried pipelines from the production wells to the central facility and then back to injection wells. Both the facility and the pipelines would need to be designed to consider appropriate measures to minimize the potential for spills and releases and to respond in the event of accidents or malfunctions related to brine handling. Operators would also need to evaluate and align the surface footprint of the required well networks with any regional cumulative effects management frameworks to minimize the environmental effects of surface disturbance. Again, these environmental concerns are comparable to those encountered at existing oil and gas facilities and it is expected that these concerns will be managed consistent with the existing frameworks that regulate the environmental aspects of oil and gas facility operation within each province.

Regulatory considerations

With lithium production still in its infancy, the regulatory structure governing its production is very much uncertain. This section discusses the potentially applicable regulatory regimes in Alberta, British Columbia and Saskatchewan, while flagging uncertainties and concerns arising therefrom.

Alberta

Ownership, access and royalties

Where mineral rights are owned by the province, a valid mineral lease will be required to recover the lithium pursuant to the *Metallic and Industrial Minerals Tenure Regulation* (MMTR).[3] As the Crown in right of Alberta owns approximately 80% of the mineral rights in the province, this is likely to be the most common method of obtaining ownership or the right to recover lithium. On private lands, mineral lease agreements will be required with the mineral rights owner for a given parcel.

Pursuant to the *Mines and Minerals Act* (MMA), an exploration licence or permit is required to explore for minerals.[4] Prior lithium projects have applied for exploration permits under the *Metallic and Industrial Minerals Exploration Regulation* (MMER).[5] The distinction between a licence and a permit is that the latter allows for the operation of exploration equipment. As such, it is reasonable to anticipate a permit being required for the exploration of lithium. Permit applications for mineral (non-oil and gas) exploration are typically made to *Alberta Environment and Parks* (AEP); however, the *Alberta Energy Regulator* (AER) has jurisdiction over the exploration provisions contained in Part 8 of the MMA for energy resources (currently limited to oil, gas, oil sands and coal).

As discussed in the Geothermal section, this framework raises the potential for overlapping mineral and oil and gas dispositions given that subsurface rights to extract different resources may be held by different parties. This is a source of uncertainty for lithium developers, as there does not appear to be a clear framework for prioritizing overlapping subsurface rights. In the ordinary course, Alberta enjoys a scheme whereby ownership of a subsurface resource provides a right to work that resource. This principle may be constrained, however, by specific priority conferred upon oil and gas resources by the AER under its public interest mandate or through express legislative priority, for instance.[6] These priorities are not tested within the context of lithium production, and therefore do not serve to remedy this uncertainty.

Production of a metallic and industrial mineral in commercial quantities pursuant to a permit or lease requires an order from the Lieutenant Governor in Council prior to extraction.[7] Importantly for lithium production, section 50(3)(c) of the MMTR provides an exemption from this requirement for such minerals extracted "in brine form," which may be interpreted to apply to lithium dissolved in water.

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3 *Metallic and Industrial Minerals Tenure Regulation*, Alta Reg 145/2005, ss. 37, 39.
4 *Mines and Minerals Act*, RSA 2000, c. M-17, s. 107.
5 *Metallic and Industrial Minerals Exploration Regulation*, Alta Reg 213/1998.
6 Rudiger Tscherning & Brady Chapman, "Navigating the emerging lithium rush: lithium extraction from brines for clean-tech battery storage technologies" (2020), Journal of Energy & Natural Resources Law, at 22-27.
7 *Metallic and Industrial Minerals Tenure Regulation*, Alta Reg 145/2005, ss. 39(1), 50(1)-(2).

There is no specific royalty rate for lithium in Alberta. Similarly, lithium does not appear to fit neatly within the royalty rate scheme set out in Parts 1-4 of the *Metallic and Industrial Minerals Royalty Regulation* (MMRR).[8] As such, it is expected that the applicable royalty rate would be provided under the general "metallic minerals royalty" as established in Part 1. We note that royalties established under Parts 3 and 4 of the MMRR are not particularly well-suited to lithium production given their reliance on tonnage produced, although the royalty under Part 1 is based on revenue from the "mine."[9] In any event, the recent adoption of a helium-specific royalty rate as announced in May 2020 may signal specific royalty rates for the production of other resources such as lithium and hydrogen. Greater certainty in respect of lithium royalties may be on the horizon.

The appropriate regulator

There is uncertainty surrounding the regulatory authority responsible for lithium production in Alberta. The AER appears to be well-suited to the role, given its expertise and jurisdiction under oil and gas legislation as well as Part 8 of the MMA, as opposed to AEP, which has limited-to-no involvement in oil and gas development and whose role under the minerals regime is generally focused on minerals that are mined.

The AER currently has jurisdiction over certain "specified enactments" in relation to "energy resource activities" pursuant to its enabling legislation, the *Responsible Energy Development Act*.[10] Such activities include those that are carried out, or "directly linked or incidental to the carrying out of an activity" in relation to any natural resource within Alberta that can be used as a source of any form of energy, not including hydro energy.[11] Lithium *per se* is not a form of energy and therefore does not appear to fit neatly within the jurisdiction of the AER for this reason. Lithium as described above, however, could be "directly linked or incidental" to carrying out an oil and gas activity in the case of co-production.

It is noteworthy that some analogous projects are regulated by the AER, such as solution salt mining.[12] Further, a number of the directives issued by the AER regarding wells appear to be directly relatable to the lithium production process. Therefore, while not *prima facie* mineral-oriented in its focus, regulation by the AER as opposed to AEP is likely to provide a clearer regulatory framework, at least in the near term. As discussed below, recent developments may resolve some of this uncertainty moving forward.

8 *Metallic and Industrial Minerals Royalty Regulation*, Alta Reg 350/1993.
9 *Metallic and Industrial Minerals Royalty Regulation*, Alta Reg 350/1993, s. 4.
10 *Responsible Energy Development Act*, SA 2012, c. R-17.3, s. 2(2).
11 *Responsible Energy Development Act*, SA 2012, c. R-17.3, ss. 1(1)(h), (i).
12 See, for example, injection well applications filed with the AER by K+S Windsor Salt Ltd., in particular application #1824568.

Licensing

Wells drilled for brine production and water disposal may be licensed under the *Oil and Gas Conservation Rules*.[13] Pursuant to the AER's directives, injection and disposal requirements for a Class II well — used for injection and disposal of produced water (brine) or brine equivalent fluids, including brine from salt caverns or solution mining operations — are likely to be required for lithium production under Directive 051.[14] Further, a licence from the AER for a water source well and water injection well as outlined in Directive 056 [15] and applications for compulsory pooling and special well spacing under Directive 065 [16] may be required.

Under the *Water Act*, an exemption from licensing requirements to divert water is provided for the diversion of "saline groundwater" pursuant to the *Water (Ministerial) Regulation*.[17] Saline groundwater is further defined by the Regulation as "water that has total dissolved solids exceeding 4,000 milligrams per litre." [18] As the aquifer brine being diverted in the lithium process is well over the 4,000 mg/L salinity threshold, a water licence is not required.

An environmental assessment may be required under the *Environmental Protection and Enhancement Act* (EPEA) .[19] As lithium production is not enumerated as either a "mandatory activity" or an "exempted activity" under the applicable regulation,[20] an environmental assessment would fall within the general discretion of the regulator under section 41 of the EPEA.

Liability considerations

The AER requires all upstream oil and gas wells, facilities and pipelines to be regulated pursuant to its Licensee Liability Rating program, which is designed to prevent the costs of suspending, abandoning, remediating and reclaiming such projects from being borne by the Alberta public in the event a licensee becomes defunct. This program relies on a liability management rating (LMR) system which is a numeric representation of a licensee's eligible deemed assets over its deemed liabilities. Once the LMR is below 1.0, financial security is required from the licensee.

13 *Oil and Gas Conservation Rules*, Alta Reg 151/1971, ss. 2.020, 2.040.
14 Alberta Energy Regulator, *Directive 051: Injection and Disposal Wells—Well Classifications, Completions, Logging, and Testing Requirements*, at 2.4, https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-051.
15 Alberta Energy Regulator, *Directive 056: Energy Development Applications and Schedules*, https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-056.
16 Alberta Energy Regulator, *Directive 065: Resources Applications for Oil and Gas Reservoirs*, https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-065.
17 *Water (Ministerial) Regulation*, Alta Reg 205/1998, Sched. 3, s. 1(e).
18 *Water (Ministerial) Regulation*, Alta Reg 205/1998, s. 1(1)(z).
19 *Environmental Protection and Enhancement Act*, RSA 2000, c. E-12.
20 *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta Reg 111/1993, Scheds. 1, 2.

The principal concern arising from the Licensee Liability Rating program is that the LMR system is designed to quantify oil and gas assets as opposed to assets used in other types of resource development. Directive 006 notes, in particular, that licensed injection wells and brine wells as defined in Directive 056 are subject to the Licensee Liability Rating program.[21] As alluded to in the licensing section above, the AER has a wealth of technical expertise in respect of the wells and systems that would be required for lithium production. That said, as provided for in Directive 011, deemed assets are based on established netbacks, shrinkage and conversion factors which are specific to the oil and gas industry.[22] This leaves considerable uncertainty surrounding the LMR classification as it applies to lithium assets, which is unlikely to be remedied until a lithium project regulated by the AER proceeds.

British Columbia

Regulatory structure

It is possible that production of lithium from brines would be regulated in British Columbia under the *Geothermal Resources Act* (GRA). The GRA provides for a broad definition of "geothermal resources" that includes "all substances dissolved in the steam, water or water vapour" obtained from a geothermal well, but does not include water that has a temperature less than 80°C at the point where it reaches the surface, or hydrocarbons.[23] In the case that a lithium project falls within this definition of a geothermal resource, its facilities will be regulated by the *BC Oil and Gas Commission* (BC OGC) pursuant to the *Oil and Gas Activities Act* (OGAA).[24]

The regulatory structure for lithium as a geothermal resource would be the same as outlined previously in the Geothermal section. In the event lithium is not co-produced with geothermal energy and does not fall within the definition of a geothermal resource, the relevant mineral regime will apply. The remainder of this section discusses this regime.

Ownership, access and royalties

To secure ownership of a mineral in British Columbia, it is first necessary to obtain a free miner certificate pursuant to the *Mineral Tenure Act*.[25] This certificate furnishes the right to acquire and maintain mineral title.

The principal concern arising from the Licensee Liability Rating program is that the LMR system is designed to quantify oil and gas assets as opposed to assets used in other types of resource development, like lithium.

21 Alberta Energy Regulator, *Directive 006: Licensee Liability Rating (LLR) Program and Licence Transfer Process*, at appendix 1, https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-006.

22 Alberta Energy Regulator, *Directive 011: Licensee Liability Rating (LLR) Program: Updated Industry Parameters and Liability Costs*, at 3, https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-011.

23 *Geothermal Resources Act*, RSBC 1996, c. 171, s. 1(1).

24 *Oil and Gas Activities Act*, SBC 2008, c. 36. See, in particular, *Oil and Gas Activities Act General Regulation*, BC Reg 274/2010, s. 3(1)(a).

25 *Mineral Tenure Act*, RSBC 1996, c. 292, s. 8.

Following this, a claim must be obtained for exploration and development.[26] The recorded holder of mineral title through a claim must then convert the claim to a mineral lease in accordance with the *Mineral Tenure Act* to carry out mining production.[27] To maintain a claim beyond its expiry date, prescribed development or exploration work must be undertaken and registered by the claim holder.[28] A concern arises that such prescribed work may not be amenable to solution lithium production.[29] Note that, in lieu of undertaking and registering such work, a claim holder may provide a payment instead of exploration and development pursuant to section 10 of the Regulations.[30]

Mineral royalties are provided for under the *Mineral Tax Act*.[31] To date, lithium is not enumerated as a "taxable resource" under the Act.[32] As the Government of British Columbia indicates, however, its non-inclusion does not mean it is non-taxable. Currently, applicable taxes on the resource are unknown.

Licensing

A permit for a lithium project is likely required pursuant to the *Mines Act*, which applies to the lifecycle of the mining activity.[33] The definition of a "mine" provided for in the Act is sufficiently broad to capture lithium production.[34] To obtain such a permit, an applicant must submit a detailed plan outlining, *inter alia*, reclamation of the site.

A discharge approval is required for mining projects pursuant to the *Environmental Management Act* (EMA) for effluent discharge, air emissions and solid waste. The authorization may be in the form of either a permit or an approval.[35] As an approval is only valid for a period of up to 15 months, a permit is likely required for a commercial lithium project.

The Ministry of Energy, Mines and Low Carbon Innovation and the Ministry of Environment and Climate Change Strategy allow for joint applications for *Mines Act* and EMA permits.

Mineral royalties are provided for under the *Mineral Tax Act*. To date, lithium is not enumerated as a "taxable resource" under the Act.

26 See: Government of British Columbia, *Information Update No. 7 – A Guide to Surface and Subsurface Rights and Responsibilities in British Columbia*, Revised September 2017, last accessed: January 7, 2021 (online), at 3.
27 *Mineral Tenure Act*, RSBC 1996, c. 292, s. 42.
28 *Mineral Tenure Act*, RSBC 1996, c. 292, s. 29
29 For both physical and technical development or exploration requirements, see *Mineral Tenure Act Regulations, BC Reg 529/2004, Schedule A. See also: Government of British Columbia, Information Update No. 25 – Exploration and Development Work*, https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/mineral-titles/notices-mineral-placer-titles/information-updates/infoupdate25.pdf.
30 *Mineral Tenure Act Regulations*, BC Reg 529/2004, s. 10.
31 *Mineral Tax Act*, RSBC 1996, c. 291.
32 Government of British Columbia, *Mineral Tax* (website), last accessed: January 7, 2021 (online).
33 *Mines Act*, RSBC 1996, c. 293, s. 10.
34 *Mines Act*, RSBC 1996, c. 293, s. 1.
35 *Environmental Management Act*, SBC 2003, c. 53, ss. 14, 15.

If proceeding under the GRA, the provisions of the *Water Sustainability Act* (WSA) do not apply.[36] Therefore, no authorization for the diversion of water is required. On the other hand, where regulated under the mining regulations, a groundwater licence to divert water from an aquifer may be required.[37] An exemption from this requirement is provided where the water is "unrecorded water," meaning the right to its diversion or use is not already held under an authorization or another enactment, and it is used for "prospecting a mineral."[38] The *Groundwater Protection Regulation* imposes additional technical requirements applicable to groundwater wells. Lithium development, however, is likely to be largely exempted[39] from these regulations, as the associated water will constitute "deep groundwater" under the regulations.[40]

An environmental assessment certificate is also required under the *Environmental Assessment Act, 2018* (BCEAA) for any "reviewable project."[41] A lithium project would only be reviewable where it has an annual production capacity of 75,000 tonnes or more.[42] This 75,000 production threshold – reflective of traditional mining figures – is unlikely to ever be met by a single lithium project and, as such, the requirement for an environmental review is unlikely to be triggered under the current regime.

As alluded to above, reclamation plans are submitted as part of permitting under the *Mines Act*. Part 10.7 of the *Health, Safety and Reclamation Code for Mines in British Columbia* sets out the standards for reclamation of such a site.[43] Pursuant to the permitting process under section 10 of the *Mines Act*, a proponent is required to pay security to the mine reclamation fund.[44]

Saskatchewan

Of the three jurisdictions profiled, Saskatchewan has what is likely the clearest regulatory structure in relation to lithium production. It is outlined under the province's mining regulations. Across multiple statutes, the definitions of "mineral" and "mine" are broad enough to cover lithium production. For example, the common definition of a mineral is "any non-viable substance formed by the processes of nature, irrespective of chemical or physical state and both before and after extraction, but does not include any

36 *Geothermal Resources Act*, RSBC 1996, c. 171, s. 4.
37 *Water Sustainability Act*, SBC 2014, c. 15, s. 6(1).
38 *Water Sustainability Act*, SBC 2014, c. 15, ss. 1(1), 6(3).
39 With the exception of the provisions outlined in s. 4(2).
40 *Groundwater Protection Regulation*, BC Reg 39/2016, s. 4(1)(a); *Water Sustainability Regulation*, s. 51.
41 *Environmental Assessment Act*, SBC 2018, c. 51, s. 6.
42 *Reviewable Projects Regulation*, BC Reg 243/2019, ss. 3(1), 9, 10.
43 British Columbia Ministry of Energy and Mines, *Health Safety and Reclamation Code for Mines in British Columbia*, https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia.
44 *Mines Act*, RSBC 1996, c. 293, ss. 10(4)-(5), 12.

surface or ground water, agricultural soil or sand or gravel."[45] Likewise, a mine is defined as "any facility in Saskatchewan for extracting, recovering or producing any mineral except oil and gas."[46]

Ownership and exploration

Similar to Alberta, the vast majority of mineral title in Saskatchewan is held by the province. As such, it is likely that the provisions and related regulations of the *Crown Minerals Act* (CMA) will apply to a lithium project.[47] In respect of the appropriate tenure scheme, lithium is expressly included within the definition of a "subsurface mineral" under the *Subsurface Mineral Tenure Regulations* (SMTR).[48] These regulations set out a streamlined process for obtaining tenure and rights to explore and work subsurface minerals.

Pursuant to these regulations, a permit is required for exploration of a mineral.[49] The permit also grants an exclusive right to develop the subsurface minerals within the permitted lands. Importantly, subsurface mineral permits are granted through a public offering process similar to that for oil and gas tenure in Saskatchewan, in which an interested party applies and the permit is issued according to a bidding process triggered by such an application.[50] This process ensures that overlapping dispositions – as present under the regulatory scheme in Alberta – are unlikely to arise. Once a project proponent is the holder of a permit, they may apply for a lease, which permits the proponent to extract the mineral.[51]

Royalties

Lithium royalties are somewhat uncertain in Saskatchewan. The dedicated SMTR currently only prescribes royalty rates for salt and potash.[52] On the other hand, the general provisions of the *Crown Mineral Royalty Regulations*, under Part II, Division II, prescribe a royalty rate for all minerals.[53] As such, it is likely that this general royalty rate applies to lithium produced, although the minister retains the right to determine the amount of the royalty payable pursuant to a mineral disposition in any particular case.[54]

Lithium royalties are somewhat uncertain in Saskatchewan. The dedicated SMTR currently only prescribes royalty rates for salt and potash.

45 *The Mineral Resources Act*, 1985, SS 1984-85-86, c. M-16.1, s. 2(1)(f); *The Crown Minerals Act*, SS 1984-85-86, c. C-50.2, s. 2(1)(i).
46 *The Mineral Resources Act*, 1985, SS 1984-85-86, c. M-16.1, s. 2(1)(e); *The Crown Minerals Act*, SS 1984-85-86, c. C-50.2, s. 2(1)(h).
47 See, in particular, *The Crown Minerals Act*, SS 1984-85-86, c. C-50.2, ss. 2(1)(d), (e).
48 *The Subsurface Mineral Tenure Regulations*, RRS, c. C-50.2, Reg 30, s. 2.
49 *The Subsurface Mineral Tenure Regulations*, RRS, c. C-50.2, Reg 30, s. 8.
50 *The Subsurface Mineral Tenure Regulations*, RRS, c. C-50.2, Reg 30, s. 7.
51 *The Subsurface Mineral Tenure Regulations*, RRS, c. C-50.2, Reg 30, ss. 18, 19
52 *The Subsurface Mineral Royalty Regulations*, 2017, RSS, c. C-50.2, Reg 32.
53 *The Crown Mineral Royalty Regulations*, RSS, c. C-50.2, Reg 29, s. 13.
54 *The Crown Mineral Royalty Regulations*, RSS, c. C-50.2, Reg 29, s. 4.

Licensing

Pursuant to *The Water Security Agency Act* (WSAA), authorization is required from the Water Security Agency before diverting, pumping or using any groundwater or constructing any works necessary to do so.[55] As distinct from Alberta's legislative scheme, there is no express carve-out for saline groundwater. The authorizations required for a lithium project would be an approval to construct works as a result of pumping such groundwater, as well as a water rights licence for the use of the groundwater.[56]

It is likely that a lithium project would fall within the broad definition of a "development" under the *Environmental Assessment Act* (SEAA), though the definition does lend itself to some discretion on behalf of the minister.[57] As such, a proposal may be submitted to the minister for determination as to whether the project is properly classified as a development pursuant to section 7.2 of the SEAA. If determined not to be a development, the minister will allow the project to proceed without an environmental assessment. Notwithstanding the broad definition of a "development," experience has shown that projects of similar scope to lithium projects are not likely to be classified as a development requiring an environmental assessment in Saskatchewan.

Further approvals from the Minister of Environment are required under *The Mineral Industry Environmental Protection Regulations* for the construction, installation, alteration, operation or temporary closure of a pollutant control facility, or to decommission and reclaim a mining site as defined in the Regulations.[58] Moreover, section 12 of the regulations provides that both a plan for decommissioning and reclamation and an assurance fund must be approved before the operation of a project.

Finally, and of limited application, where the site of a proposed project is on provincial land and the operator or site holder plans to return the site to provincial custody following decommissioning and reclamation, a release into the institutional control program is required pursuant to *The Reclaimed Industrial Sites Act* and the associated regulations.

55 *The Water Security Agency Act*, SS 2005, c. W-8.1, s. 57.
56 *The Water Security Agency Act*, SS 2005, c. W-8.1, ss. 2(t), 50, 59.
57 *The Environmental Assessment Act*, SS 1979-80, c. E-10.1, s. 2(d). See also, ss. 7.5, 7.6 evidencing the discretion of the minister.
58 *The Mineral Industry Environmental Protection Regulations*, 1996, RSS, c. E-10.2, Reg 7, ss. 3, 5, 7, 10, 12.

A path forward

In March 2019, the Government of Canada, in consultation with the provincial and territorial governments as well as other stakeholders, released the Canadian Minerals and Mines Plan, partially directed at updating mining legislation and regulatory frameworks to make them more effective in the face of a changing global mining sector. The plan looks not only to technological advancements in mining, but also to the increasing importance of specific metals and minerals, both of which are positive developments for prospective lithium producers.

A preliminary version of the first action plan under the Canadian Minerals and Mines Plan was released in March 2020. While it does not provide much in the way of substantive solutions moving forward, a few points are noteworthy. First, the plan actively points to lithium as a critical mineral, following the lead of the United States.[59] Second, the plan acknowledges the growing importance of such critical minerals to the global demand for clean energy.[60] This is especially true of lithium given its use in lithium-ion batteries and the expansion of the electric vehicle and energy storage markets globally. As such, lithium is front of mind for regulatory modernization under the Canadian Minerals and Mines Plan.

This is evident in Alberta in particular. On September 23, 2020, the Government of Alberta announced the creation of a five-member Mineral Advisory Council to "help unlock Alberta's vast, untapped geological potential for various minerals that are in increasing global demand."[61] One of the minerals expressly considered is lithium. Of principal importance to the advisory council is streamlining the regulatory environment in place for mineral development in a way that assures environmentally responsible development, enhances opportunities for indigenous peoples, promotes innovation and attracts investment.

The final strategy and action plan under the Canadian Minerals and Mines Plan are anticipated in the spring of 2021. While there is no indication at this time as to what is expected out of the provincial action plan, the focus on regulatory modernization does evidence a willingness to address some of the regulatory uncertainty mentioned above.

59 Mines Canada, *Action Plan 2020: Introduction the Pan-Canadian Initiatives March 2020 Preliminary Version*, at 2, https://www.minescanada.ca/sites/default/files/cmmp-actionplan2020_rev52_feb_29_2020-a_en.pdf [*Action Plan 2020*]. See also: Mines Canada, *Update to Action Plan 2020*, https://www.minescanada.ca/sites/default/files/pictures/PDF/cmmp_actionplan2020_update_final-en.pdf.

60 *Action Plan 2020*, at 6.

61 Government of Alberta, *Capitalizing on Alberta's Mineral Potential*, https://www.alberta.ca/release.cfm?xID=7329753D827B2-FC42-4C4C-2177ED7E26BFAABA.

OSLER **AUTHORS**

Sander Duncanson
Partner,
Regulatory, Environmental,
Aboriginal and Land

sduncanson@osler.com
403.260.7078

Jessica Kennedy
Associate,
Regulatory, Environmental,
Aboriginal and Land

jkennedy@osler.com
403.260.7062

Jesse Baker
Associate,
Regulatory, Environmental,
Aboriginal and Land

jbaker@osler.com
403.260.7025

MATRIX SOLUTIONS INC. **AUTHORS**

Brian Fuchs P.Eng.,
Vice President Operations

bfuchs@matrix-solutions.com
403.513.9428

David Murfitt M.Env., P.Geo.,
Senior Hydrogeologist

dmurfitt@matrix-solutions.com
403.727.0628

Eric Pelletier M.Sc., G.I.T.,
Geologist-in-training

epelletier@matrix-solutions.com
403.910.4543

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