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Considerations in the Design of a Royalty Regime for Helium

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Matters commented on: Press Release, "New royalty rate responds to soaring helium interest" Minister of Energy, May 13, 2020; Department of Energy, Information Letter IL 2020-22 , Helium Royalty Rate, May 13, 2020; *Natural Gas Royalty Regulation, 2009* (AR 221/2008) as amended by OC 154/2020; and *Natural Gas Royalty Regulation, 2017* (AR 211/2016) as amended by OC 155/ 2020.

On May 13, 2020 Minister Sonya Savage announced the establishment of a new royalty rate for helium produced from Crown lands. The new rate (5% minus a 0.75% helium royalty adjustment factor, for an effective rate of 4.25%) replaces a *zero* royalty rate for helium production. The press release suggests that the proposed royalty structure "helps set the stage for investment" by providing some certainty while "ensuring a fair price for Albertans." (This is misleading. The market will set the price not the royalty.) The press release goes on to indicate that, "[t]his effective royalty rate is set for an initial period of five years. At that time, the rate will be reviewed to ensure it remains competitive and allows for any necessary adjustments." The accompanying Information Letter issued by the Department (IL 2020-22) suggests that the review is to be limited to the appropriateness of the 0.75% adjustment factor, not the entire rate.

The new royalty is implemented by amendments to the *Natural Gas Royalty Regulations* of 2009 and 2017 (each applies to different 'vintages' of production) and made retroactive to April 1, 2020. (Prior to these amendments there was a requirement (see IL 2018-25, now revoked), that "operators producing and selling helium must report monthly helium production volumes and monthly average selling prices ….") The new royalty will only apply to helium produced from lands where the mines and minerals are vested in the Crown. If helium is produced, saved and sold from private mineral lands, the applicable royalty will be established by the terms of the lease between the owner of the mines and minerals and the working interest owners.

Helium is an important non-renewable natural resource with many significant applications, for some of which there is no substitute. As the US Bureau of Land Management (BLM) notes on its "About Helium" page:

> … helium is a critical component in many fields, including scientific research, medical technology, high-tech manufacturing, space exploration, and national defense. Here are a few examples:
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> - The medical field uses helium in essential diagnostic equipment such as MRI's. Helium-neon lasers are used in eye surgery.

- National defense applications include rocket engine testing, scientific balloons, surveillance craft, air-to-air missile guidance systems, and more.
- Helium is used to cool thermographic cameras and equipment used by search and rescue teams and medical personnel to detect and monitor certain physiological processes.
- Various industries use helium to detect gas leaks in their products. Helium is a safe tracer gas because it is inert. Manufacturers of aerosol products, tires, refrigerators, fire extinguishers, air conditioners and other devices use helium to test seals before their products come to market.
- Cutting edge space science and research requires helium. NASA uses helium to keep hot gases and ultra-cold liquid fuel separated during lift-off of rockets.
- Arc welding uses helium to create an inert gas shield. Similarly, divers and others working under pressure can use a mix of helium and oxygen to create a safe artificial breathing atmosphere.
- Helium is a protective gas in titanium and zirconium production and in growing silicon and germanium crystals.
- Since helium doesn't become radioactive, it is used as a cooling medium for nuclear reactors.
- Cryogenics, superconductivity, laser pointers, supersonic wind tunnels, cardiopulmonary resuscitation pumps, monitoring blimps used by the Border Patrol, and liquid fuel rockets all require helium in either their manufacture or use.

For many of these applications, there is no substitute for helium.

Establishing a Royalty Formula

A royalty is one of the mechanisms that a government, as the resource owner on behalf of the people, can use to appropriate the economic rent available from the production of the resource. In somewhat simplistic terms, economic rent can be thought of as the difference between price (value of the product in the market) and the full cycle costs of production, including a reasonable rate of return recognizing the relative riskiness of the business. In that sense (potentially, at least), economic rent is a surplus that a government should be able to appropriate without removing the incentive to invest in that business. I say "potentially" because if the market price drops and costs of production exceed the market price (as has been the case for oil this year), rent is negative and there is nothing for governments to appropriate.

It follows from this that the available rent will vary, principally in relation to the costs of production and market price. As the costs of production fall (for a sector or a particular producer) and market price rises, the economic rent available increases (and vice versa). Governments and other resource owners can respond to this variability by designing a royalty that is explicitly sensitive to price and cost or, more generally, profit-sensitive. Governments can also structure royalties to allow for some sharing of risk between the government as owner and the resource developer by deferring significant rent recovery until the operator has recovered its costs. This may be particularly important for capital intensive projects such as oil sands projects. These risk sharing arrangements result in governments taking a small gross royalty until the operator has

recovered its sunk costs (this recovery point is often called "payout", for ABlawg discussions of payout see here and here), and then a share of net profits after payout.

The government of Alberta has long applied this sort of royalty design in the oil sands sector and has applied these ideas more generally to the conventional sector following the last royalty review (see Alberta, Modernized Royalty Framework Guidelines (2017)). Within such a scheme, there may be separate royalty rates for co-produced products. This is the case, for example, with respect to sulphur produced through the processing of a sour natural gas stream that is not subject to geological acid gas disposal. Schedule 6 of the current *Natural Gas Royalty Regulation, 2017* establishes a sulphur royalty of 16.67%.

While the availability of positive rents places a cap on royalty implementation options, other factors will also influence the ambition of governments when settling on a royalty rate including other sources of government "take" (e.g. taxes, federal or provincial), but also "competitiveness" considerations. Competitiveness refers to the fact that capital is mobile and will migrate to jurisdictions that offer it the best return. Competitiveness therefore asserts a downward pressure on royalty rates; it can have a ratchet effect that can lead to an unhelpful (from a public perspective) race to the bottom.

Application to Helium

The helium market, and especially the North American helium market, is a distorted market that has been distorted for years by the national security policies of U.S. federal government. Graham Simpson of GLJ Petroleum Consultants offers an excellent summary of these policies. According to his account (supplemented by the U.S. Bureau of Land Management's (BLM) helium page) the U.S. federal government cornered the market on U.S.-produced helium through the *Helium Act of 1925* and, subsequently, in 1962, arranged for its storage in the partially depleted Cliffside gas field in Texas. A change of policy in 1996 gave direction to the BLM to begin disposing of the helium reserve. This continues today under the terms of the *Helium Stewardship Act of 2013*, which mandates the disposal of all helium assets by 2021.

There is no benchmark price for helium (like WTI or Brent for oil) and it is therefore difficult to get a firm handle on price (much depends on the purity of the helium), although in recent years the price has certainly been trending upwards. The most recent BLM helium data sheet (published in 2020 but quoting figures from 2018) informs that, "[t]he estimated price for private industry's Grade-A helium was about $7.57 per cubic meter ($210 per thousand cubic feet), with some producers posting surcharges to this price."

With the termination of the U.S. helium program in 2021, there should be a less distorted North American helium market. Globally, the most important producer of helium outside the U.S. is Qatar, which may suggest the risk of considerable price volatility, given geopolitical considerations.

Opinions differ as to the pricing implications of disposing of all the helium stored at Cliffside. While some suggest that the loss of incremental supply from that storage (approximately 30% annually of U.S. supply) might lead to a price spike, others anticipate that this will simply

encourage the development of new projects, such as those eagerly anticipated in Alberta and Saskatchewan. For details of proposed projects see Maurice Smith, "Weil group plans Canada's first helium liquefaction facility Medicine Hat", *JWN Energy* (1 November 2017); Janet French, "Alberta's new helium royalties could see rise of extraction industry", *CBC News* (17 May 2020); and "The rise of helium", *The Weil Group* (September 2019). Perhaps all that we can say is that it is difficult to predict the future for helium prices.

Most helium is produced as a valuable co-product of natural gas processing from helium-rich natural gas deposits (containing between 0.3 and 4 per cent helium). More recently, however, others are focusing their exploration activities on nitrogen-rich accumulations that contain even higher percentages of helium. In both cases, helium can be separated from other gas streams by cryogenic processing. The principal economic difference between these two production scenarios is that in the former, natural gas will generally provide the principal revenue source whereas in the latter, the principal, if not the only, revenue source will be the helium. Press reports (see Janet French above) suggest that the recent interest in southern Alberta is targeting nitrogen-rich accumulations to explore their helium potential.

Where does all of this leave us in terms of royalty design for such a commodity? What do we know? We know that the government has established a flat rate royalty for helium that is produced, saved and sold, and we know that it has picked an effective rate of 4.25%, but we have very little idea of what might have informed either of those decisions. The little that we do know suggests that competitiveness was certainly a significant driver. We know this because IL 2018-25, which required the reporting of helium production and sales, indicated that, "[e]fforts to establish a royalty rate for helium production will be done with consideration for competitiveness with neighbouring jurisdictions." The concern with competitiveness is reiterated in IL 2020-22, as noted above.

As it happens, Saskatchewan's helium royalty rate is the same as that introduced in Alberta: 5% minus a 0.75% Saskatchewan Royalty Credit (see *The Oil and Gas Tenure Registry Regulations*, RRS c C-50.2, Reg 31, s 9-26 (Saskatchewan Tenure Regulations)). We should ask if competition to attract helium investors best serves the interests of the two provinces. Is this perhaps not an instance where Saskatchewan and Alberta might be better served by cooperation - especially given the need to establish coordinated helium processing and infrastructure facilities?

Missing from any of Alberta's publicly available information is any consideration of whether an effective rate of 4.25% represents a fair sharing (as between the government and proponents) of the available rent at different price levels. In other words, there is nothing in the public record that I have found, other than the reference to competitiveness, that justifies either an effective rate of 4.25%, or the choice of a flat royalty rather than a profit-sensitive royalty design. While a flat-rate royalty might be more readily justified in the context of helium that is co-produced with methane and other hydrocarbon liquids (on account of the complexity of any cost allocation as between the different revenue streams), it would be good to know more about why the government did not adopt a profit-sensitive royalty to dedicated or pure-play helium projects, for which helium is the only source of revenue.

Tenure Design Issues

Reference to the Saskatchewan Tenure Regulations also raises the question as to whether or not Alberta's tenure scheme under the *Mines and Minerals Act*, RSA 200 0, c M-17 (*MMA*) and associated regulations is really fit for purpose in those cases in which the proponent's target is an accumulation of nitrogen containing helium, rather than a hydrocarbon accumulation that may contain some helium. In the case of the latter, the appropriate form of tenure is clearly a petroleum and natural gas licence or lease issued and continued under the terms of the *Petroleum and Natural Gas Tenure Regulation*, Alta Reg 263/1997, but this is less obviously the case for a drilling operation that is not directed at petroleum or natural gas.

Saskatchewan has addressed this issue by establishing forms of tenure that are specific to helium (namely, helium and associated gases permits and leases). Indeed, while the Saskatchewan Tenure Regulations contain no less than 113 references to helium, there is not a single reference to helium in the *MMA* or any of its more than 30 regulations. While there is no doubt that helium found underground is a mineral for the purposes of the *MMA* (see the recent decision in *Alexis v Alberta (Environment and Parks)*, 2020 ABCA 188 (CanLII) and the ABlawg post here), it is not a hydrocarbon, and neither is nitrogen. (I acknowledge that the definitions in the *Oil and Gas Conservation Act*, RSA 2000, c O-6 may ultimately have some limited bearing on the appropriate legal characterization of helium).

Royalty Certainty

Readers of this blog will recall that during the 2019 fall session the Kenney government introduced and passed the *Royalty Guarantee Act*, SA 2019, c 9, amending the *MMA* to provide that no fundamental restructuring of the royalty framework should apply to any new well until it had been in production for ten years. I commented on Bill 12 here. In the present context it is important to note that the amendment only applies the guarantee to "*hydrocarbon* royalties reserved to the Crown" (emphasis added). Helium, as noted above, is not a hydrocarbon and therefore one would anticipate that the guarantee would not apply to the helium royalty – neither the zero royalty that applied until April 1, 2020 nor the current effective rate of 4.25%. However, it is not inconceivable that, insofar as the helium royalty is established as part of the Natural Gas Royalty Regulations, some may try to argue to the effect that the helium royalty is simply part of the hydrocarbon royalty framework and thus entitled to the same level of protection. As I commented at the end of the post on Bill 12 "the only sure bet is that if Bill 12 is enacted in its current form it guarantees that the validity of all future royalty changes will be challenged in the courts."

Conclusion

As noted in the introduction, helium is an important non-renewable natural resource with many significant and non-substitutable applications. Given Alberta's considerable strengths in conventional oil and natural gas production and processing, the possibility of tapping potentially significant helium resources in the province represents a significant diversification opportunity for Alberta. However, in seeking to incent investment in this resource it is also important to be sure that we have an appropriate tenure regime in place and that we have, not only a *competitive*

helium royalty rate, but a royalty rate that is *fair* to both project proponents and the public in those instances in which the public is the owner of this valuable resource. Based on the evidence in the public record it is not clear that this regime strikes the right balance.

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