Re: US Executive Order on Recovery and Use of Space Resources

Open Letter to Honourable François-Philippe Champagne, Minister of Foreign Affairs

Vancouver Recommendations on Space Mining, Outer Space Institute, April 20, 2020

First, I am not a legal expert, nor am I an expert in international treaties or relations. I am simply a mining guy trying to figure out how to enable Canadian industry and participate in space exploration through In Situ Resource Utilization.

I have read the “Open Letter” and the “Vancouver Recommendations”

The letter claims to speak for the space industry and the mining industry in Canada, yet none of the signatories identified in either the letter or the Vancouver document are industrial representatives for those sectors. In fact, of the 27 delegates listed in the “Vancouver Recommendations” all are academics except for 5 from “other” sectors. Of the 7 signatories to the “Open Letter” none are from the mining sector. Without adequate representation of these sectors there can be no claim of knowledge of what would constitute the “…interests of the Canadian space and mining industries”. I am not aware of any survey or other public outreach that may have addressed this question. Speaking as both a mining sector and aerospace sector entrepreneur, neither of the two groups signatory to the documents represent my views on the issue.

There is a suggestion in the Open Letter that the Law of the Sea (UNCLOS) be used as a template as a means of developing a leadership role for Canada. From a mining industry perspective UNCLOS worked more to prevent exploration or utilization of undersea resources for several decades. For example, in a paper recently published by Wiley Spicer and the University of Calgary, there is a statement that Canada agreed to limitations in the undersea nickel resources as a means to try to protect its own nickel mining operations. This seems to be in opposition to the purported “for all mankind” driver of UNCLOS. UNCLOS has not really enabled economic development of the seabed, other than the development of some offshore oil mining, the attendant UNCLOS fees over which Canada and Newfoundland/Labrador have been battling for some time.

The main reason for the apparent failure of UNCLOS seems to be that those mining companies and government agencies that expend significant resources in development of a resource or, in this case, a space exploration venture should not be expected to part with their hard won rewards except for taxation with representation for law, order and good governance in Cislunar space. We should note that existing international law under the Outer Space Treaty prohibits countries from claiming sovereignty; however, enacting national taxation is a prima facto case of declaring sovereignty.

While I agree that a regulatory framework is a good idea, I point out that the UNCLOS required significant time and resources to negotiate, effectively stalling any developments of the seabed. It makes sense for the global players in ISRU, a select group to which Canada does not yet belong, to develop a set of standards that would aid and support
space mining, as opposed to suppressing it. These standards will have a key role in ensuring that space mining activities are accessible to all states willing to engage in these activities, while also protecting the interest of individual organizations (government or private) to ensure a continuous flow of financial and human capital, as well as continuous innovation. In addition, such standards must be built to ensure the protection of our planet and its nearby satellites. However, it is possible to develop these standards incrementally, as the technology continues to evolve.

Multi lateral agreements are designed to enshrine rights, privileges and responsibilities of individuals and companies in an international setting. They establish procedures and penalties that prevent conflict at a larger scale. Canada should pursue a multilateral strategy; however, in the interim it is in our national interests, as declared in the Canadian Metals and Mining Plan, to develop ISRU/Space Mining laws that recognize property rights for its citizens and corporations. The pursuit of a treaty is a long-term affair with no assurances of unanimity among the space powers. Luxembourg and the US have recognized this fact and have acted accordingly.

Perhaps a better approach would be to emulate the various mining regulatory issues that have arisen in the past, typically with the lead of the Canadian mining sector. As an example, many of the mining regulatory instruments such as NI 43-101 and JORC, which both resulted from the Bre-X gold field scandal in the 1990’s, have become the de facto means to regulate standards for mining exploration companies. The subsequent proliferation of these was by means of emulation of the Canadian experiences, by and large. JORC is primarily driven by the technical needs of the mining business, while NI 43-101 is increasingly a tool for securities regulation. It is interesting to note that the JORC rules were written by the Joint Ore Reserves Committee, a mining industry body made up of technical professionals and the NI 43-101 was created by the Canadian Securities Administrators, a group that is largely made up of lawyers. At this time, JORC is under review for adoption into legislation by Luxembourg via a contract to i-Space of Luxembourg. Europe and the US seem to be leading the way here. If Canada wants to lead, then we cannot lead from outside, but must get to the table as a participating player.

I would like to highlight a key misunderstanding that is apparent in the Vancouver Recommendations: there seems to be an assumption that ISRU activities equate to ‘strip mining’ (i.e., to mine until the body is completely depleted of resources). This is simply not the case. Close examination of all the presently published ISRU proposals involving excavation shows that the amount of material excavated to support permanent full time bases on the Moon is in the order of a swimming pool per year, if we agree on the 5% by weight presence of water in craters as is presently base-lined in lunar architecture studies. It is important to note that not all water-mining proposals require excavation, some simply heat the surface to force water extraction, for example. With better grades and higher water content becoming evident, this swimming pool sized excavation pit shrinks while still delivering the same product. This is a fundamentally different activity than current planetary commercial mining activities, and thus cannot be approached with the same mindset. This is not to say that there will not come a time where strip-mining will be possible. However, we are very far from that point in time, both from a technological
standpoint and from a commercial viability standpoint.

As to the purported hazards of space mining, I would point the threat to the Earth from commercial space mining activity is practically nil. The largest concern is from activities in low Earth orbit, which create navigational hazards; however, there are currently zero mining activities in LEO.

The Vancouver Recommendations appears to be science focused demanding that samples be provided for every mining operation and that data collected or developed via commercial operations be shared without fees to the scientific and research community and perhaps general public at large. Although this is an interesting and worthy perspective, it illustrates a fundamental disconnect between academia and the private sectors. The recommendation seems to read as “we should not engage in space mining unless we can conduct science as the primary objective”. Although science is and will forever continue to be an important part of space exploration, we cannot allow space commercialization to be dictated by a single agenda. I find it difficult to accept that the Vancouver Recommendations feel it necessary to dictate to commercial interest that science must come first. Commerce is about generating economic benefits that inevitably spin down to social benefits, one of which is funded research. Industry interest in space mining will result in mass funding towards such initiatives, on an order of magnitude that is impossible to achieve through scientific grants alone. The suggestion that industry must provide free access to any and all academics is an affront to intellectual property rights, which is a principle driver of innovation in Canadian society. I would much rather see collaboration between the academic and private spheres on how we can work together to create an environment where Canadian businesses and Canadian scientists can both benefit from space mining activities, instead of the approach taken by the authors of the Vancouver Recommendations.

ISRU activities are the gateway to deep space exploration. Thus, a healthy Canadian space mining industry will enable Canadian industrial growth and allow Canadian researchers to access and study the mysteries of space.

Unfortunately, the open letter seems to be calling for a moratorium on ISRU from Canada until another UNCLOS style convention for space is developed, regardless of what Europe and the US are doing and what rumours purport other jurisdictions are considering. I fear this will do more harm than good, since Canada will ultimately be left behind and unable to access ISRU activities in the future. This will be a huge blow to both the Canadian Mining and Space sectors, which pride themselves on being world leaders in their respective fields. We have a choice to make – do we want to be at the forefront of innovation, science, and economic development? Or do we want to wait for the rest of the world to dictate how Canada conducts its space and mining activities?

Canada’s best option, in my opinion, is to join the club investing in ISRU, build on our global mining regulatory base and extend it to include space mining as a means to ensure we maintain an enviable seat at the table. In this way, Canada enables the growth of Canadian industry in this new economic sector while ensuring a voice in the development
of practical standards and multilateral agreements. Not only will this ultimately benefit Canadian industry and Canadian society, but it will also guarantee our scientists front row seats to space science

Dale S. Boucher