

Star Diamond Corp - Orion South Diamond Project

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KIMBERLITE CARBON CAPTURE: WORKING TOWARDS A CARBON NEGATIVE DIAMOND MINE

SASKATOON, Feb. 27, 2024 - [Star Diamond Corp.](#) (TSX: DIAM) ("Star Diamond" or the "Company") is pleased to provide this technical update on the opportunity for Carbon capture using processed kimberlite from the Star - Orion South Diamond Project. This process is known as Carbon mineralization and preliminary studies referenced below indicate that kimberlite waste rock from these kimberlites may indeed function as a significant sink of atmospheric CO₂.

Highlights

- The most common mineral in kimberlite is Olivine, and its Serpentine Group weathering products, which, when exposed to the atmosphere at the Earth's surface, react with carbon dioxide ("CO₂") to form solid mineral carbonates and remove carbon from the atmosphere.
- During our recent joint venture with Rio Tinto Exploration Canada Inc. ("RTEC"), RTEC as Project Manager, contracted academics at the University of Alberta (Professor Sasha Wilson) and Trent University (Dr. Ian Power) to analyse kimberlite samples from both the Star and Orion South Kimberlites to determine the modal proportions of Olivine minerals in each sample and the ability of these Olivine minerals to react with CO₂ to form solid, stable carbonate products.
- The initial studies at the two universities have shown that the Star and Orion South samples contain significant proportions (62.5 - 83.5%) of Lizardite, a Serpentine Group weathering product of Olivine that reacts with CO₂.
- When exposed to the atmosphere at the Earth's surface, Lizardite reacts with CO₂ to form stable carbonates. Laboratory studies conducted at the universities show that, under specific conditions, these Lizardite containing kimberlite samples can react with significant quantities of CO₂ and remove it from the atmosphere: as much as 398 kg CO₂ per tonne of processed kimberlite when fully reacted.
- The 2018 Preliminary Economic Assessment ("PEA") estimates that for a future mine on the Star and Orion South Kimberlites, some 470 million tonnes of kimberlite will be processed at a rate of 45,000 tonnes per day, over 34 years, to recover about 66 million carats of diamonds. Star Diamond is working with the academic institutions to develop a scope of work to investigate Carbon mineralization opportunities for this enormous volume of processed kimberlite.
- A future mine to recover diamonds from the Star and Orion South Kimberlites has the advantage of being supplied with electricity from the SaskPower grid. Consequently, all waste stripping, ore mining and delivery to the processing plant and processing equipment can operate on grid power, resulting in an unusually low carbon footprint for the mine.

The university laboratories were provided with fifteen samples, which include six core samples of Early Joli Fou kimberlite breccia ("EJF-KB"), Early Joli Fou pyroclastic kimberlite ("EJF-PK") and country rock Shale. There are also samples of processed products including fine, processed kimberlite ("PK") from the fines management area ("FMA") and processed kimberlite lights from the dense media separator ("DMS FLOATS"). The six core samples were initially crushed and all 15 samples were pulverized in an agate mill. X-ray diffraction was used to determine the quantitative mineralogy of the samples. Thirteen samples were shown to contain significant proportions of the Serpentine Group mineral Lizardite, which is reactive with CO₂. Under specific laboratory conditions the maximum CO₂ mineralization potential, expressed as kilograms of CO₂ that reacts with the Lizardite, per tonne of material sampled, was determined for each of the Lizardite bearing samples and these results are shown in Table 1 below.

Table 1. Samples details and results.

| Sample # | Source ¹ | Type ² | Lizardite % | Lizardite CO ₂ Mineralization Potential (kg CO ₂ /tonne) |
|----------|---------------------|-------------------|-------------|--|
| 1 | FMA | PK | 77.7 | 370 |
| 2 | FMA | PK | 65.8 | 314 |
| 3 | FMA | PK | 63.6 | 303 |
| 4 | FMA | PK | 62.5 | 298 |
| 5 | FMA | PK | 74.8 | 356 |
| 6 | DMS Floats | PK | 70.3 | 335 |
| 7 | DMS Floats | PK | 76.8 | 366 |
| 8 | DMS Floats | PK | 75.3 | 359 |
| 9 | DMS Floats | PK | 57.5 | 274 |
| 10 | SPF-024 | Shale | - | 0 |
| 11 | SPF-024 | Shale | - | 0 |
| 12 | SPF-033 | EJF-KB | 83.5 | 398 |
| 13 | SPF-033 | EJF-KB | 78.9 | 376 |
| 14 | SPF-033 | EJF-PK | 73.1 | 348 |
| 15 | SPF-034 | EJF-PK | 76.4 | 364 |

1. FMA - Fines Management Area, DMS Floats - Dense media separator light fraction, SPF - Drill Core

2. PK - Processed kimberlite fines, Shale - country rock, EJF-KB - Early Joli Fou kimberlite breccia, EJF-PK - Early Joli Fou pyroclastic kimberlite

These initial results illustrate that there is potential for the Lizardite in the processed kimberlite, from the Star and Orion South Kimberlites, to capture significant quantities of atmospheric CO₂, which can have a positive effect on the lowering of the carbon footprint of a future mine. Additional analyses need to be conducted on larger samples with the aim of developing carbon capture methods that can be incorporated in a future diamond mine.

Senior VP Corporate Development Star Diamond, George Read, states: "These initial results illustrate that there are opportunities for future carbon sequestration from processed kimberlite ore. While these initial results have been developed on small samples under carefully controlled laboratory conditions, we hope that further work on larger samples will enable processes to be incorporated in the processing of kimberlite and the construction of waste dumps that can accelerate these carbon capture reactions, particularly with the vast quantities of Lizardite that will end up in the waste material. The proximity to infrastructure, particularly the electrical power grid, provides a future Fort à la Corne diamond mine with a unique opportunity to minimize its carbon footprint, as all mining, ore and waste movement and ore processing can be accomplished using electrically powered equipment."

Interim President and CEO, Ewan Mason, states: "While these results are preliminary, they never-the-less indicate that we may be able to extract Carbon from the atmosphere by filtering out CO₂ using waste rock as a storage sink. Should this turn out to be the case, we will be exploring the applicability of utilizing the Carbon Capture and Storage refundable tax credits announced by the federal government in its 2022

Federal Budget as part of our Feasibility Study planning. Given the projected mining rate of 45,000 tonnes of ore per day from our 2018 PEA, we can see that the Fort à la Corne kimberlites could indeed become a colossal Carbon sink if we can scale a Carbon capture process to our contemplated operations. This then could play a significant role in helping Canada meet its greenhouse gas (GHG) emissions reduction targets."

All technical information in this press release has been prepared under the supervision of George Read, Senior Vice President Corporate Development, a registered Professional Geoscientist in the Provinces of Saskatchewan and British Columbia and Mark Shimell, Vice President Exploration, a registered Professional Geoscientist in the Province of Saskatchewan and Alberta, who are the Corporation's "Qualified Persons" under the definition of NI 43-101.

About Star Diamond Corporation

Star Diamond is a Canadian-based corporation engaged in the acquisition, exploration and development of mineral properties. Shares of Star Diamond trade on the Toronto Stock Exchange under the trading symbol "DIAM". Star Diamond's most significant asset is its interest in the Fort à la Corne property in central Saskatchewan. These kimberlites are located in close proximity to established infrastructure, including paved highways and the electrical power grid, which provide significant advantages for future mine development.

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Forward-looking statements in this press release include, but are not limited to, expectations regarding the completion of the transactions that are the subject of the Agreement and the Project's potential to be a significant contributor to both the local communities and the broader Saskatchewan economy.

These forward-looking statements are based on Star Diamond's current beliefs as well as assumptions made by and information currently available to it and involve inherent risks and uncertainties, both general and specific. Risks exist that forward-looking statements will not be achieved due to a number of factors including, but not limited to, the impact of changes in the laws and regulations regulating mining exploration, development, closure, judicial or regulatory judgments and legal proceedings and the additional risks described in Star Diamond's most recently filed Annual Information Form, annual and interim MD&A.

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