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To Whom it May Concern;

My name is Lee Andrew Groat. I graduated from Queen's University with a B.Sc. (Honours, Geology) in 1982 and from the University of Manitoba with a Ph.D. in 1988. From 1988 to 1989 I was a NATO Postdoctoral Fellow at Cambridge University. I have been a faculty member at the University of British Columbia since 1989.

Over my career I served as the principal editor of two different international mineralogical journals: *American Mineralogist*, from 2001 to 2006, and *The Canadian Mineralogist*, from 2012 to 2022. In 2003 I was elected a Fellow of the Mineralogical Society of America, and in 2009 the new mineral groatite was named in my honor. I have published extensively in peer-reviewed scientific journals.

As a mineralogist I research and teach mineralogy, the study of minerals, and in doing so I follow the recommendations of the International Mineralogical Association. The IMA is the generally recognized standard body for the definition and nomenclature of mineral species. The IMA has established requirements for a substance to be considered a distinct mineral. As of May 2024, the IMA recognizes 6,050 official mineral species; these are described in the List of Minerals: http://cnmnc.units.it/master_list/IMA_Master_List_%282024-05%29.pdf. In the following mineral names are shown in bold, and where the term “mineral” is used to refer to materials that are not minerals according to the IMA it is shown in quotation marks.

I was asked by Benjamin Isitt, Counsel for the Save Record Ridge Action Committee Society, to provide a report providing expert opinion evidence on the mineralogy of the Record Ridge mine proposed by West High Yield Resources Ltd. (“WHY”) in the vicinity of Rossland, British Columbia (the “Proposed Mine”), which is presently the subject of public consultation by the British Columbia Environmental Assessment Office (“EAO”). Materials I was provided with are listed in Appendix 1.

I certify that:

(1) I am aware that, in giving an expert opinion to a court or tribunal, I have a duty to assist the court or tribunal and not to be an advocate for any party;

(2) I have made this report in conformity with that duty; and

(3) I will, if called on to give oral or written testimony, give that testimony in conformity with that duty.

Questions Addressed

I was asked to address the following questions:

(1) In your opinion based on a review of the Materials, is the substance that WHY proposes to remove at Record Ridge a substance listed under Appendix 3 of the Review Projects Regulation?

Appendix 3 of the Review Projects Regulation states:

"For the purposes of the definitions of "industrial mineral" in section 9, the following substances are industrial minerals:"

In my opinion the only relevant section is:

"(e) all substances in which silica is the predominant mineral and that are used for an industrial purpose, including massive silica, **quartz**, quartzite, **garnet** and **corundum**;"

The substance that WHY proposes to remove at Record Ridge is serpentinite rock. If we assume that by silica the regulation actually means **quartz**, then in my opinion the material would only be an "industrial mineral" if >50% of the material removed was **quartz**.

If the Regulation actually means to state that silica is the predominant oxide, not mineral, the serpentine subgroup minerals are (see below) are silicates containing approximately 40-43 wt.% SiO_2, the oxide present in the highest concentration.

(2) For certainty, in your opinion based on a review of the Materials, is the substance that WHY proposes to remove at Record Ridge a substance in which silica is the predominant mineral?

In my opinion the substance that WHY proposes to remove at Record Ridge is not a substance in which silica is the predominant mineral because silica is not a mineral according to the IMA.

(3) In your opinion based on a review of the Materials, is the substance that WHY proposes to remove at Record Ridge a mineral based on the definition in the Mineral Tenure Act?

The Mineral Tenure Act defines "mineral" as follows:

"an ore of metal, or a natural substance that can be mined, that is in the place or position in which it was originally formed or deposited or is in talus rock, and includes

(a) rock and other materials from mine tailings, dumps and previously mined deposits of minerals,

(b) dimension stone, and

(c) rock or a natural substance prescribed under section 2 (1), but does not include

(d) coal, petroleum, natural gas, marl, earth, soil, peat, sand or gravel,

(e) rock or a natural substance that is used for a construction purpose on land that is not within a mineral title or group of mineral titles from which the rock or natural substance is mined,

(f) rock or a natural substance on private land that is used for a construction purpose, or

(g) rock or a natural substance prescribed under section 2 (2);"

Based on the definition in the Mineral Tenure Act, in my opinion, the substance that WHY proposes to remove at Record Ridge is an ore of metal (magnesium) that can be mined and is in the place or position in which it was originally formed. Therefore in my opinion it is a "mineral" according to the Act but not a mineral according to the IMA.

(4) In your opinion, what is the difference between serpentinite, serpentine and silica?

In my opinion serpentinite is a rock composed of one or more of the serpentine subgroup minerals.

In my opinion the serpentine subgroup is a set of 20 minerals, the most important of which are **antigorite**, **lizardite**, and **chrysotile**.

In my opinion silica is an oxide of silicon with the chemical formula SiO_2, commonly found in nature as **quartz**.

Letter from WHY to the BC EAO

Latterly I was also asked to comment on a letter that WHY sent to the BC EAO in February 2024. The letter states that silica is a mineral, which in my opinion is incorrect according to the IMA definition. The letter also states that "two of those silicates (**garnet** and **corundum**) do not manifest silica in their chemical composition as SiO_2." **Garnet** is a silicate mineral group, and any analysis of **garnet** will show considerable wt.% SiO_2. **Corundum** has the formula Al_2O_3, and therefore is not a silicate mineral

Respectfully submitted,

Lee A. Groat, Ph.D., P.Geo.
June 11, 2024

Appendix 1

In order to prepare my report I was provided with a link to the EAO consultation materials (https://engage.eao.gov.bc.ca/RecordRidge-PD) and the following attachments:

(1) WHY's application for permits under the Mines Act and Environmental Management Act, October 2023 (the "Mine Application");

(2) Appendix 3-B of the Mine Application (Mine Plan, October 2023);

(3) Appendix 3-C of the Mine Application (Pit Geotechnical Memo, December 2022);

(4) 2013 NI 43-101 Technical Report;

(5) 2022 NI 43-101 Technical Report;

(6) Appendix 3 of the Reviewable Projects Regulation, BC Reg 243/2019; and

(7) excerpt of the Mineral Tenure Act, RSBC 1996, c 292.

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