

Via Email

February 22, 2023

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Greenfire Resources Operating Corporation

Cassels Brock and Blackwell LLP

Attention: Aron Mansel

**Attention: Jeremy Barretto
Liv Desaulniers**

Dear Sirs and Madam:

**RE: Request for Reconsideration of the Alberta Energy Regulator’s decision to issue a Class 1b Disposal Approval, dated July 19, 2022, to Greenfire Resources Operating Corporation (Greenfire)
Request made by Canadian Natural Resources Limited (Canadian Natural)
Approval No.: 13122A
Reconsideration No.: 1941491**

The Alberta Energy Regulator (AER) has considered the request under section 42 of the *Responsible Energy Development Act* (REDA) for a reconsideration of the AER’s decision to issue Approval No. 1322A (Approval). The AER has reviewed Canadian Natural Resources Limited’s (Canadian Natural) submissions and the submissions made by Greenfire Resources Operating Corporation (Greenfire).

For the reasons that follow, the AER has decided to exercise its authority under section 42 to reconsider the decision to issue the Approval.

The Reconsideration Request

Canadian Natural’s Submissions

On November 28, 2022 Canadian Natural requested a reconsideration of the AER’s decision to approve Greenfire’s application No. 1936402 and the issuance the Approval. Canadian Natural’s request is based on two grounds. The first ground is new information, which was not available at

the time the AER made its decision to approve the application and issue the Approval, is now available, and that the new information will lead the AER to revoke the approval. The second ground is that the AER failed to apply section 2(1)(a) of REDA and therefore committed an error of law.

Regarding the first ground, Canadian Natural submits that this new information demonstrates that its' wells and infrastructure will be adversely affected by Greenfire's disposal of Class IB fluids into the Clearwater aquifer. H₂S from the water injected in the disposal well will migrate into the Clearwater formation (Upper Mannville A) where Canadian Natural is producing gas with no H₂S content (sweet gas). Canadian Natural's closest wells to the disposal are approximately 950 metres and 1950 metres away from Greenfire's disposal well. In Canadian Natural's opinion, not all the H₂S in the water injected will dissolve in the aquifer and some of the H₂S will reach Canadian Natural's wells and eventually its facility located at 11-10-084-10W4 (11-10 facility). When H₂S mixes with the methane from Canadian Natural's gas, a portion of the H₂S will partition into the vapour phase and sour Canadian Natural's sweet gas. What percentage of that H₂S will be dispersed with the methane is not yet known, but Canadian Natural has made simulations to attempt to predict the H₂S content in its gas mixture.

Canadian Natural is concerned the proximity of the disposal well will pose safety risks to its personnel and contractors working at the Clearwater zone location, given the high H₂S content of up to 100 parts per million (ppm) being injected in the disposal well. Canadian Natural is concerned about meeting the requirements of the *Occupation Health and Safety Code* (Code), which requires employers to ensure its workers' exposure to H₂S is kept as low as reasonably achievable and not exceed the Code's prescribed occupational exposure limits. Canadian Natural submits the H₂S content of the disposal well is significantly higher than the exposure limits prescribed by the Code.

Canadian Natural is also concerned that migration of H₂S will cause a premature water breakthrough to its potentially impacted wells. It is concerned about the costs to repair and maintain its sweet gas infrastructure. Canadian Natural notes when H₂S combines with water it forms sulphuric acid, which is a corrosive acid, therefore once the sour water reaches Canadian Natural's wells, it will cause corrosion damage to the wells' tubulars, piping and associated equipment including the equipment at the 11-10 facility. Canadian Natural submits that chemical analyses of 2 disposed water samples that Greenfire submitted to the AER on May 12, 2022 contain a high sulphate content of 942-955 mg/litre. This high sulphate content will initiate the growth of sulphate-reducing bacteria. Bacteria also prefers to grow on iron (Canadian Natural's

infrastructure in the area is mainly steel). These two factors will increase the risk of souring Canadian Natural's infrastructure and reservoir.

If the wells become sour and ultimately result in the souring of the 11-10 facility, Canadian Natural will be required to shut-in its wells resulting in financial losses to Canadian Natural and the sterilization of natural resources in the area. This will also lead to financial loss, in the form of royalty payments, to the province of Alberta. This reason alone is why this reconsideration request is in the public interest and why the Approval should be revoked.

Canadian Natural submits that the information it presented regarding the prejudice caused to its wells from the Approval constitutes new evidence not reasonably available at the time the AER issued the Approval and if accepted, would lead the AER to change the decision granting the Approval. Canadian Natural was never afforded the opportunity to argue its case and the AER's decision to issue the Approval was not informed by evidence of the prejudice to be sustained by Canadian Natural as a result of the Approval.

The second ground on which Canadian Natural seeks a reconsideration is that the AER erred in law when it issued the Approval. Canadian Natural argues that the Approval is not consistent with the AER's mandate. The safety risks posed by the Approval and the resulting sterilization of natural gas resources contravenes both the AER's statutory mandate under REDA and the purposes of the *Oil and Gas Conservation Act* (OGCA).

Canadian Natural submits the AER made a substantial error when it failed to correctly apply s. 2(1)(a) of REDA. Section 2(1) reads,

2(1) The mandate of the Regulator is

- (a) to provide for the efficient, safe, orderly and environmentally responsible development of energy resources in Alberta through the Regulator's regulatory activities, and
- (b) in respect of energy resource activities, to regulate
 - (i) the disposition and management of public lands,
 - (ii) the protection of the environment, and
 - (iii) the conservation and management of water, including the wise allocation and use of water,

in accordance with energy resource enactments and, pursuant to this Act and the regulations, in accordance with specified enactments.

Canadian Natural submits that because the Approval will result in the sterilization of Canadian Natural's gas wells and facility, several of the OGCA's statutory purposes outlined in Section 4 are contravened:

4(a) to affect the conservation of, and to prevent the waste of, the oil and gas resources of Alberta;

4(b) to secure the observance of safe and efficient practices in the locating, spacing, drilling, equipping, constructing completing, reworking, testing, operating, maintenance, repair, suspension and abandonment of well and facilities and in operations for the production of oil or gas or the storage or disposal of substances; and

4(c) to provide for the economic, orderly and efficient and responsible development in the public interest of oil and gas resources of Alberta.

Greenfire's Submissions

In its response submissions, Greenfire submits there are no extraordinary circumstances or exceptional or compelling grounds warranting the AER to exercise its discretion to reconsider the decision to issue the Approval. Canadian Natural never presented Greenfire with its position and technical arguments concerning safety risks to its personnel, the souring of the Clearwater Zone, and the pre-mature breakthrough in any correspondence it received between April 8, 2022 and June 29, 2022. Canadian Natural did not make any substantial effort to engage meaningfully and Greenfire remained unaware of Canadian Natural's technical concerns until they were raised to the AER.

Although Greenfire does not believe that this is the correct forum to refute the erroneous technical assertions made by Canadian Natural in its request, it provides additional details to reiterate further that disposal operations will not materially impact Canadian Natural's localized gas interests.

Greenfire notes that the H₂S content of the disposal fluid is less than 100 ppm, with the actual H₂S concentration in the disposal stream being well below 100 ppm. The reference water analysis results referenced by Canadian Natural are baseline samples taken from the Clearwater Formation before any disposal operations were conducted. They show that the Clearwater contained 942-955 mg/L of SO₄ (sulphate), not H₂S before any injection operations were conducted. Therefore, all subsequent consequences referenced by Canadian Natural are misplaced.

Greenfire disposes water into the existing reservoirs' water zone, not directly into the gas zone. Over time, the disposal water stream will increase the reservoir pressure, minimizing concerns about gas coming out of solution. Greenfire notes the disposal water stream contains no free gas after being processed at the central processing facility through separators, coolers, and atmospheric tanks. Injecting the water locally increases the reservoir pressure and further reduces the potential for gas to evolve out of solution. Additionally, the warm injected water will cool off in the existing cold reservoir, which further decreases the ability of the gas to evolve. The modelling done by Canadian Natural does not consider these facts.

Canadian Natural's concerns about the pre-mature watering out of the gas reservoir are aggrandized within its submission. As shown by Greenfire's data, there has been no material impact from injection operations that match any of the assumptions and opinions presented by Canadian Natural.

After 6 months of injection operations, Greenfire's pressure sensors in the Clearwater disposal zone show that the gas reservoir is not materially pressuring up as presumed from Canadian Natural's predicted water level rise. The pressure sensor installed in the gas zone shows no change in the pressure decline rate.

Since Canadian Natural's concerns about the impact of H₂S on personnel, current gas production, and infrastructure are based on incorrect assumptions or are already being realized, the concerns do not constitute exceptional or compelling grounds to justify reconsideration. Greenfire requests the AER dismiss Canadian Natural's reconsideration request.

Reconsideration

The AER has authority to reconsider its decisions pursuant to section 42 of the *Responsible Energy Development Act* (REDA). That section states:

The Regulator may, **in its sole discretion**, reconsider a decision made by it and may confirm, vary, suspend or revoke the decision. [emphasis added]

As indicated in section 42, it is at the AER's sole discretion whether to reconsider a decision made by it. That section does not provide an appeal mechanism to be utilized by industry or members of the public. Other provisions of REDA are available for that purpose. Given the appeal processes available under REDA, and the need for finality and certainty in its decisions, the AER will only

exercise its discretion to reconsider a decision in extraordinary circumstances and where it is satisfied that there are exceptional and compelling grounds to do so. Mere disagreement with a decision is not sufficient.

The question that arises is whether Canadian Natural has demonstrated that extraordinary circumstances exist that provide exceptional and compelling reasons for the AER to reconsider its decision to approve the application and to issue the Approval.

The AER notes that the new information provided by Canadian Natural was not available to or considered by the AER at the time the AER made a decision on Greenfire's application and issued the Approval. It is the AER's view that this new information is relevant to the AER's determination on Greenfire's application and if considered during a reconsideration, may lead the AER to change its original decision. As such, the AER has determined that there are extraordinary circumstances and an exceptional and compelling ground that warrants the AER conducting a reconsideration.

With regard to Canadian Natural's second ground, that the AER erred in law when it issued the Approval, it is not clear on the face of the decision that an error was made. Canadian Natural's new information must be considered before a determination whether the decision should be confirmed, varied, suspended or revoked can be made, and if varied, suspended or revoked, whether due to an error of law or due to new evidence before the AER. Therefore, the AER does not find that Canadian Natural's allegation of an error of law constitutes a separate ground on which the AER will conduct a reconsideration. Rather Canadian Natural's allegation of an error can be viewed as new information similar to the other information it has submitted, and may be considered during the reconsideration.

The AER finds the new information provided by Canadian Natural satisfies the exceptional and compelling grounds threshold pursuant to which the AER will, in its sole discretion, reconsider its decisions under section 42 of REDA. The AER has decided to exercise that discretion and will conduct a reconsideration of the decision to issue the Approval, with a hearing.

A reconsideration with a hearing will allow both Canadian Natural and Greenfire to submit evidence and test each other's evidence through cross examination, in order for the AER to determine under section 42 of REDA whether the Approval should be confirmed, varied, suspended or revoked.

In conclusion, the AER has decided to hold a reconsideration hearing in respect of Approval No. 13122A and will request the Chief Hearing Commissioner to appoint a panel of hearing

commissioners to conduct the hearing. The AER encourages Canadian Natural and Greenfire to continue sharing information in parallel to a reconsideration hearing to ensure safe and effective operations.

Sincerely,

<Original signed by>

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Principal Engineer

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Steve Thomas
Director, Oil & Gas Subsurface, Waste

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Michael Bevan
Senior Advisor, Water

cc: Lars Olthafer, Blakes, Cassels and Graydon LLP
Heather Sampson, Canadian Natural
William McClary, AER