Responses to Questions and Comments

Application to amend the global certificate of approval - Offsetting Program for Wetlands, Bodies of Water and Riparian Settings (Condition 2.1)

Your Ref.: 3214-14-042

Goldcorp Canada Ltd., Éléonore

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GENERAL APPROACH OF THE OFFSETTING PROGRAM

QC-1.

The proponent shall specify the connection between the knowledge acquisition project on wetlands currently in progress in Nord-du-Québec and to which it contributes financially and the offsetting project for wetlands, bodies of water and riparian settings which is the object of this application.

A-1. Goldcorp Canada Ltd. Éléonore (hereinafter GCL Éléonore) is not a partner and has not made a financial contribution to said knowledge acquisition project on wetlands for Nord-du-Québec.

However, note that the investments required for the implementation of this offsetting plan will be considerable, including seed collection (when possible), multi-phase planting, corrective actions, inventories for assessment of QH gains and annual reports. The very preliminary estimates already show that revegetation alone will be double the cost for conventional revegetation by hydro-seeding with herbaceous plants. It is estimated that these costs could range from ± $9,000/ha to approximately $15,000-$20,000/ha. If it is considered that the total of the areas to be reclaimed is around 400 ha, this could involve an increase in reclamation costs to $4.4 M for revegetation alone. Obviously, when the detailed offsetting plan will be carried out (after approval of the offsetting plan) and the first revegetation tests are conducted, it will be possible to have a better idea of the actual costs. Adjustments may be made to maintain the offsetting costs at a level comparable to the offsetting costs for similar projects in northern Québec, while ensuring the required QH gain.

To allow the administrator to better follow the investments associated with the offsetting plan, GCL Éléonore proposes to present in the annual report a follow-up of the expenditures realized and planned for implementation and follow-up of the offsetting plan.

QC-2.

For the offsetting program submitted by the proponent, the scale considered is limited to the mining project. The proponent shall indicate if it considered using a larger scale that would have included the Wemindji community and traplines and, if such is the case, why the larger scale was not the preferred option.

A-2. The priority of the offsetting program submitted by GCL Éléonore is offsetting of the traplines impacted directly by the Éléonore Mine's activities. The program affects three (3) traplines (VC22, VC28 and VC29). It extends along the road to the mining site (approximately 60 km), and on the mining site itself.

It is important to mention that the development of the Wemindji territory is relatively recent and limited, offering few disturbed sites to be reclaimed. Nonetheless, research was conducted to identify other sites conducive to offsetting in the territory:

- Consultations were held with the tallymen and the families for the three traplines impacted (VC29, VC28 and VC22, which have a total area of approximately 6000 km^2). Trapline VC22 under the responsibility of Ronnie Georgekish, between km 0 and 6 of the road; Trapline VC28 under the responsibility of Isaac Visitor, between km 6 and 52; Trapline VC29, under the responsibility of Angus Mayappo, which includes the mine and the adjacent road segment (km 52 to 70). The tallymen of these three territories were consulted several times on these questions.
- A series of field visits were conducted, accompanied by the different tallymen, in summer 2017. Each of the sites to be reclaimed along the road was visited: sand pits, quarries, former winter roads. On that occasion, the reclamation options were discussed for each site. During these interviews, they were also questioned about the possibility of other sites they knew and that would need to be cleaned up, improved or reclaimed.
- A consultation workshop on offsetting projects was held on November 6, 2018 at the Éléonore Cree Cultural Centre, attended by the tallymen and their families of the traplines affected by the mining project, two representatives of the Cree Nation Government (CNG) and several Éléonore employees. The full report is available on request. The objectives were to consult with those affected about the type of project and the species that would be planted at the 21 reclamation sites in the first phase. On that occasion, the question of other reclamation options for the territory was raised again.
- Phone calls or face-to-face interviews were held in 2017 with various local stakeholders to survey them about the presence of potential sites to be reclaimed: Marc Dunn, Director, Environment of Niskamoon, Damas Arseneault, Supervisor of Eeyou Lumberjack and Johnny Mark, Director,

Environment of Wemindji. They gave the same answer: there is no site at Wemindji that requires ecological reclamation.

- Exchanges were also held with Hydro-Québec representatives, including email exchanges between May and September 2017 with Benoit Gagnon (Project Manager, Environmental Assessment, HQ) and Robert Lussier (Environmental Advisor, HQ). The objective was to know if there were sectors requiring reclamation in the La Sarcelle sector. The answer obtained was that everything HQ had to reclaim had been done and that no site remained to be reclaimed in the region.

Throughout these territories, apart from the sectors impacted by GCL Éléonore, no degraded site suitable for the offsetting project was identified. For these reasons, the sites associated with construction of the road and the mine were identified as the most suitable sites to carry out the offsetting program.

INVENTORY AND CHARACTERIZATION OF WETLANDS AFFECTED BY THE PROJECT

QC-3.

The wetlands, including the ombotrophic bogs, are composed of an assemblage of vegetation associations, distributed according to various gradients. To support the assessment of ecological value, the vegetation associations inventoried in the wetlands that will be impacted must be described, accompanied by their cartographic location. As applicable, this will allow the proponent to highlight the vegetation associations harbouring floristic richness of interest or that may influence the assessment of ecological value.

A-3. The floristic study of the bogs conducted by Arseneault and Fenton (2012) of the Université du Québec en Abitibi Témiscamingue (UQAT) does not mention any vegetation association, except for micro-habitats, as described in the following table excerpted from Arseneault and Fenton (2012).

Table 1: Compilation of micro-habitats typically present in the bogs with a typical species per habitat (taken from Arseneault and Fenton, 2012)

Habitat		Espèce typique
Mare, trou d'eau		*Calliergon stramineum*
Butte	Haut	*Sphagnum fuscum*
	Côté	*Sphagnum capillifolium*
	Bas	*Sphagnum cuspidatum*
Rochers		*Grimmia apocarpa*
Sphaignes vivantes		*Mylia anomala*
Sphaignes moribondes		*Riccardia latifrons*
Arbres vivants		*Ptilidium pulcherrimum*
Matière organique en décomposition		*Pleurozium schreberi*
Matière ligneuse en décomposition		*Anastrophyllum hellerianum*
Matière minérale exposée (sable argile)		*Polytrichum juniperinum*
Excréments		*Splachnum sp.*
Zones ombragées		*Cephaloziella rubella*
Zones ensoleillées		*Sphagnum magellanicum*

Let us now cite Golder 2008 (note that station 10, mentioned in this study, is not part of the bogs impacted): *[TRANSLATION] "The ombotrophic bogs are also fairly similar in the study area. They are mainly composed of heath, as well as sphagnum and sedge. Diversity is very low, except for the station 10 bog, which stands out for its greater abundance of species... …However, in all the bogs inventoried, no orchid was observed. This may be a sign that the setting is poor and less conducive to the presence of dragon's mouth orchid (Arethusa bulbosa). Among the bogs visited, some are mostly composed of heath. This leaves little room for the establishment of herbaceous species, including special-status species.* "

Let us cite the impact assessment (Golder, 2010), which undoubtedly is the most in-depth study of the area of the mining project in terms of biodiversity: *[TRANSLATION] "Large expanses of uniform open bogs sometimes create structured bogs with non-oriented ponds (Buteau et al., 1994) along the Opinaca River."* These are bogs that have not been impacted. "Smaller bogs, generally drier and more wooded, are also abundant throughout the study area. The topography of mounds and troughs contributes the local distribution of vegetation groups" (Figure 1).

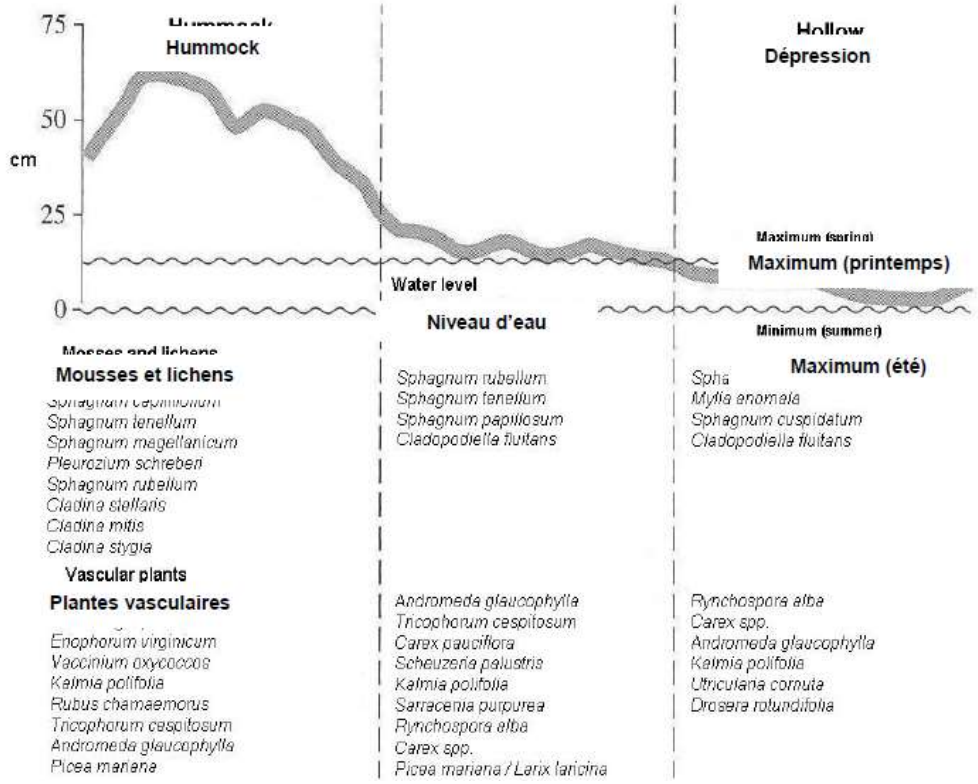

Figure 1 : Main vascular and non-vascular species colonizing different habitats of the bogs (taken from Golder, 2010)

This information shows that there are no vegetation associations harbouring floristic richness of interest that could influence the ecological value in the bogs impacted.

QC-4.

The proponent mentions that the absence of rare or threatened plant species reduces the ecological value of the bogs. However, the presence of wildlife species that are threatened, vulnerable or likely to be designated as threatened or vulnerable is not mentioned. The proponent will have to consider wildlife in the assessment of the ecological value of these habitats, whether by adapted wildlife inventories or by the use of existing data, as the case may be. In particular, there does not seen to have been a specific inventory of avian fauna in bogs MH59 to MH61, even though the olive-sided flycatcher and the rusty blackbird, two species at risk, are likely to nest there. The proponent will have to give further justification why, in the absence of a specific ornithological inventory for these bogs, it nonetheless considers that species at risk are absent. If the presence of wildlife species that are threatened, vulnerable

or likely to be designated as threatened or vulnerable is confirmed or strongly suspected, the proponent will have to adjust accordingly its assessment of the ecological value of the wetlands impacted.

A-4. In general, to influence the assessment of a setting's ecological value, it is not enough to observe a species at the regional level. This species must nest or feed in the bog concerned.

The olive-sided flycatcher (Contopus Cooperi) is a softwood forest species. In Wemindji, it is on the fringe of its range. This species was inventoried by Golder (2010) only in the black spruce-moss forest. It is likely to nest in this habitat and feed in the bogs. However, no observation during or after the impact assessment showed that this species was feeding in the bogs impacted by the mining site.

The rusty blackbird (*Euphagus carolinus*) was not observed during the various studies that led to the impact assessment (Golder, 2010). One observation in [TRANSLATION] "scrubland and other biotopes", made by Mousseau in 2002 (cited by Roche, 2007b) is mentioned in these studies. This observation was made in the context of studies on Hydro-Québec's account in the Opinaca Reservoir sector. However, no observation station was found in the Éléonore Mine study area. The closest station was found about 40 km from the study area. This species thus remains potentially present in the project area, but its presence has never been confirmed. Consequently, no observation proves this species is present in the study area, let alone that it was feeding in the bogs impacted by the mining site.

The avian inventories conducted during the impact assessment were considered sufficient by the authorities to authorize the project, when it was already known that these bogs would be impacted. It is no longer possible to conduct representative new inventories, given that almost all of the bogs to be offset have already been destroyed.

QC-5.

In the floristic study of the bog located in the footprint of the tailings storage facility, the invascular species *Cephaloziella rubella* and *Scapania irrigua* were inventoried. However, the varieties *sullivantii* and *rufrescens* of these respective species appear on the list of invascular species likely to be designated as threatened or vulnerable, published by the Centre de données sur le patrimoine naturel du Québec (December 2015). The proponent will have to specify if it is possible that these two subspecies at

risk are present in the wetlands impacted. If their presence is confirmed or strongly suspected, the proponent will have to adjust accordingly its assessment of the ecological value of the wetlands impacted.

A-5. The floristic study (Arseneault and Fenton, 2012) of the bog located in the footprint of the tailings storage facility was conducted before the start of construction of the tailings storage facility. During that period, the sullivantii and refrescens varieties did not have special status and, for that reason, identification of the variety was not required. The authorities then considered these inventories sufficient for the project authorizations, considering the regulations in force at that time. UQAT, which had conducted the 2012 floristic study, was contacted to find out if the samples collected were still available for identification of the variety. Unfortunately, after several moves on the university's premises, it has not been possible to find the Éléonore Mine samples to date. If the samples are found, the variety will be identified and, if required, the ecological value will be reviewed. It is no longer possible to conduct representative new inventories, given that almost all of the bogs to be offset have already been destroyed.

OFFSETTING PROJECT

QC-6.

Other projects in a similar sector (particularly Hydro-Québec's Eastmain-1-A power plant and Rupert diversion project) made it possible to draw certain conclusions in relation to the plant species chosen and the appropriate densities for revegetation of this type of setting. The proponent must indicate whether it consulted these results and how they were integrated into its own offsetting plan. If it did not conduct such a consultation, the proponent will have to take steps to use this type of data, which is already available and potentially applicable to its offsetting project.

A-6. During development of the offsetting program, an exchange of information was attempted with Hydro-Québec (HQ). Emails were exchanged between May and September 2017 with (Project Manager, Environmental Assessment, HQ) and Robert Lussier (Environmental Advisor, HQ). Despite several attempts and reminders, it was impossible to obtain any information from HQ. During the same period, GCL Éléonore conducted visits to certain sites reclaimed by HQ, particularly in the La Sarcelle sector. These sites were reclaimed by a

monoculture of green alders planted in garden-style rows. GCL's vision is to plant richer vegetation communities than green alder alone, for the following reasons:

- This type of monoculture does not allow gains in terms of biodiversity.
- The Crees consulted do not particularly appreciate this type of plant cover, which barely resembles a natural setting.

For these reasons, and the lack of cooperation, GCL did not pursue these efforts to receive information from HQ.

Moreover, GCL Éléonore has a different objective than HQ. HQ was only seeking to reclaim sand pits, which only involved rapid and stable revegetation. Green alder monoculture can achieve these objectives. For GCL Éléonore, the objective is to recreate habitats, which involves greater vegetation diversity and habitats favouring the return of animal species.

QC-7.

The proponent will have to indicate the potential sources of supply that will allow it to provide the necessary plant species to carry out its planting operation.

A-7. At this stage of the project, the sources of supply have not been established and several options are possible. After acceptance of the offsetting program and development of the detailed plans of the reclamation sites, it will be possible for GCL Éléonore to present the supply source in the annual report. However, the planting of germoplasms (seeds or cuttings) containing a northern genetic legacy and adapted to local conditions will be prioritized by GCL Éléonore. Moreover, if possible, certain species could be collected in the Eeyou Istchee James Bay territory and GCL Éléonore will assess the possibility of engaging contractors from the Cree communities, as applicable.

QC-8.

To increase the ecological value of the reclaimed sites, the proponent shall indicate if it considered providing for the planting of plant species at risk and/or integrating habitat projects for small wildlife at risk potentially present in these sectors. If so, it will have to provide a brief description of what is considered.

A-8. Compared to conventional reclamation, which is essentially monoculture, GCL Éléonore seeks a gain of biodiversity obtained by planting varied species or

even species absent from the immediate region (assisted migration). The objective of the proposed offsetting is to provide locally enhanced ecological services. It is possible that these new habitats will attract species at risk, but this is not the main objective of the offsetting program. GCL Éléonore does not envision planting special-status plant species at risk (great difficulty finding seeds) or creating habitats specifically for special-status wildlife species, but this remains an opportunity if the occasion arises.

QC-9.

The wildlife inventory data transmitted by the proponent does not make it possible to obtain a picture of the impacts of the offsetting plan on wildlife. The proponent is asked to conduct avian fauna studies, targeting the species at risk, integrating inventory stations on the sites that were targeted for the different phases of reclamation.

A-9. Offsetting will be performed on land strongly impacted by industrial activities and that barely resemble natural settings conducive to avian species as long as they are not reclaimed. All the sites targeted by offsetting are lands for which GCL Éléonore has a legal obligation of reclamation (Mining Act (M-13.1), Regulations respecting sand pits and quarries (Q-2 r.7.1), Regulation respecting the landfilling and incineration of residual materials (Q-2 r.19)). In the context of these reclamations, there are no requirements to conduct avian fauna inventories prior to the work, precisely because these settings are highly degraded and must be reclaimed.

For these reasons, GCL Éléonore does not plan to conduct additional wildlife inventories before starting reclamation/offsetting on the degraded sites. However, a documented assessment will be conducted on the potential presence of avian species at risk, depending on the habitat to be reclaimed. If work is scheduled during the nesting period of species potentially present, a prior field inspection will be conducted to confirm there is no nesting. If there is nesting special-status species, measures will be deployed to avoid disturbing this nesting.

QC-10.

Certain abandoned road sections (winter roads) will be reclaimed. The proponent refers to the Regulation respecting standards of forest management for forests in the domain of the State (RSFM). The RSFM is no longer in force and was replaced on April 1, 2018 by the Regulation respecting the sustainable development of forests in the domain of the State (RSDF). The proponent will have to confirm that the abandoned roads (winter roads) will be reclaimed in accordance with the standards in force, particularly those of the RSDF.

A-10. Error of reference on the part of GCL Éléonore, the RSDF will be considered and the work will comply with the RSDF.

QC-11.

Woodland caribou particularly use softwood forests with 10-25% density (Class L) and 26-40% density (Class D), with heavy lichen cover. The habitats targeted for this species are described in the offsetting plan as "dense softwood stands" and the planting density will be 4,000 seedlings/ha. The proponent will have to specify what density will be planted to ensure it obtains a mature forest of interest for woodland caribou. It will also have to give a brief presentation of the techniques it will use to encourage the establishment and growth of lichen in these habitats, in accordance with the existing literature.

A-11. First of all, it is important to specify that the woodland caribou is potentially present in the Éléonore Mine sector but has never been observed. However, woodland caribou are present at certain times during its migration. Also, when caribou habitats are in question, this involves the creation of predominantly coniferous habitats likely to meet caribou needs, also including habitats for other wildlife species, and different ecological services for the users of the territory. Despite what is indicated in the offsetting plan, the ideal planting density is not yet determined. The objective is to work more with the density sought and based on experience to determine the required planting density. A consultant has already been mandated to support GCL Éléonore in this regard.

Regarding lichens, GCL Éléonore does not undertake to grow them. According to a discussion with Nicole Fenton, Professor at the Université du Québec en Abitibi-Témiscamingue (UQAT) and specialist in vegetation biodiversity, bryophytes and spruce-moss forest dynamics, it is very difficult to grow lichen

and the process can be very long and arduous. At this stage of the project, GCL Éléonore does not anticipate a research partnership on growing lichen because the research priority will go to assisted migration.

QC-12.

The proponent shall describe the approach in which the offsetting proposal is included and present the various offsetting projects overall. However, since these reclamation projects are projected over variable time horizons, it is important that the COMEX be informed of the details of the projects in advance so that it can comment on them.

A-12. GCL Éléonore proposes to include an "Offsetting" subsection in the "Reclamation" section of the annual report. In this section, the planning of the subsequent year(s) and the follow-up of the work already accomplished will be presented.

QC-13.

Since assisted migration is a relatively new application concept, the proponent will have to specify whether this concept has already been applied in Nord-du-Québec or elsewhere and, if so, what are the main results allowing prediction of success in the current case. The proponent will also have to indicate whether the project could have been accomplished in partnership with researchers in this field so that the results are part of a knowledge development and acquisition approach.

A-13. Various Québec stakeholders were contacted and a literature review was conducted on assisted migration and the risks associated with this type of habitat project. The results of this review were taken into consideration in the development of the offsetting program. Indeed, depending on the associated risks, various precautionary measures are provided for and described in the offsetting program. Since this technique is fairly new, the success of this planting is not assured. For this reason, the assisted migration tests will be conducted on a very small scale to avoid having to reseed large areas in case of mixed results.

Also, it is planned to work in partnership with researchers to increase the technique's chances of success or at least improve knowledge of the subject. For this purpose, GCL Éléonore has already taken steps with UQAT to establish a university research partnership on assisted migration, more specifically for cedar.

In addition, GCL Éléonore is currently working with a consultant, Viridis Terra International (VTI), which has experience in assisted migration and which is interested in doing applied research and development in collaboration with university teams.

Several examples of research projects in relation to assisted migration across Canada, presented below, show the extent of implementation of this technique.

Although assisted migration is a fairly new approach, several Canadian provinces have already deployed research programs and guidelines on this subject. In Québec, the misadaptation risks are managed by using seed transfer functions developed in the past and knowledge of the climate conditions of the places of origin and travel of the seed sources. Efforts have already been in place for several years for black spruce and jack pine. Indeed, since 2009, the "northern" class seeds of certain black spruce seed orchards have been planted farther north (southern limit and median of the spruce-moss forest) than their place of origin (according to verbal communication with André Rainville, F.Eng., M.Sc., retiree and former researcher with the Direction de la recherche forestière). Moreover, for the past 15 years, the needs for black spruce seedlings have moved south and north of the 50th parallel. Thus, according to the transfer models accounting for climate change (Beaulieu et al., 2004), northward movements have been extended farther. Finally, the jack pine sources, based on the Mátyás and Yeatman model (1992), are already planted 0.5° to 1° latitude farther north than their origin. The assisted migration of white spruce and black spruce is being deployed according to the models of Beaulieu et al. (2004) and Rainville *et al*. (2014) in order to identify, for the 2050 horizon, the first-generation orchards most inclined to misadaptation and those with the best performance potential according to the climate forecasts. This will ensure production of these two species in the context of climate change.

A research project begun in 2011 in collaboration with the MFFP and Université Laval has the purpose of specifically studying assisted migration of white spruce (Lamhamedi et al., 2017). An experimental device completely dedicated to assisted migration thus was installed between 2013 and 2015 at nine planting sites throughout the Province of Québec. Each site consists of seedlings from the eight seed orchards most commonly under the Québec reforestation program. These new tests will allow simulation of the climate gradients equivalent to 5.8°C and the transfer of seeds with eight genetic sources from seed orchards.

According to Natural Resources Canada: “In an assisted migration trial in Claremont, Ontario, led by Natural Resources Canada and the Ontario Ministry of Natural Resources, six hardwood species were gathered from four different seed sources and replicated five times. Species and seed sources were selected from locations approximately 500 (Pennsylvania), 900 (Kentucky) and 1,400 (Tennessee) kilometres south of the Claremont planting site, using one local seedzone as a control. Trials such as these and older forest genetics trials are increasingly being used to help address the many questions raised by assisted migration.” (NRC, 2020).

QC-14.

Since some mint species are recognized as invasive, the risk that *Mentha canadensis* will become invasive at the projected reclamation sites will have to be described, as well as the measures to be applied to prevent this problem, as applicable.

A-14. It is recognized that mint can rapidly invade gardens if it is not controlled adequately. However, it does not appear in the Global Invasive Species Database (ISSG, 2020), nor on the List of pests regulated by Canada (CFIA, 2020), nor in the recent work by Claude Lavoie (2019) on Québec’s 50 most invasive species. In a natural setting, where competition is stronger than in a garden, the risk of invasion is limited. This useful species was selected by the tallymen with the intention of developing it locally, especially if it becomes abundant. Let us remember that all species subject to assisted migration will be planted in small quantities initially to observe their adaptation potential.

QC-15.

Concerning the borrow pits (quarries and sand pits), Section 8 of the offsetting plan mentions that it is possible that certain measures set out in the Regulation respecting sand pits and quarries are not followed to the letter. Note that the Regulation respecting pits and quarries was amended on April 18, 2019. In its example, the proponent indicates that the Regulation specifies that: "Every project referred to in paragraph c of section 37 must be designed to prevent water stagnation. Except for the part that serves to ease slopes according to section 38, such artificial body of water must be at least 2 m in depth at its shallowest point."

This wording is no longer present in the new Regulation (Chapter Q-2, r. 7.1). It would therefore be appropriate to clarify and specify how certain measures of the new Regulation would not be followed to carry out offsetting projects.

A-15. Error on the part of GCL Éléonore; all the measures of the new regulation will be followed to carry out the offsetting project.

SAND PIT R-34-A

QC-16.

The ecological inventory of the sites, presented in Appendix 4, describes the presence of a pond and a lower topography in the central section of the sand pit, constituting wetland reclamation potential. However, the project is limited instead to a dense coniferous plantation. Since condition 2.1 of the global certificate of approval requires offsets in relation to the project's impacts on the wetlands, the project of this type of setting should be prioritized when allowed by the conditions of the site. Thus, the proponent will have to review the proposed reclamation of Sand Pit R-34-A so as to develop a wetland or wetlands (potentially a marsh and a pond). This will particularly allow an increase in the diversity of plant and wildlife habitats. If this option is not possible for technical reasons, the proponent will have to justify it.

A-16. In the offsetting plan, it is written that "the refilling of the reclamation sites will be carried out in such a way as to retain water and avoid excessive drainage that could cause erosion and reduce the amount of water in the surface layers of the soil that will be necessary to feed the seedlings". The development of a marsh or a pond will be prioritized if allowed by the conditions for this sand pit. Let us remember that detailed plans for each reclamation site will be produced once the offsetting plan is accepted. Thus, a small wetland could be created in a sand pit intended for the target species Caribou and for appropriate species accompanying those associated with a softwood habitat.

Moreover, GCL Éléonore must specify that during the production of the detailed offsetting plans, the option of creating wetlands (with or without a pond) will always be assessed and prioritized, particularly in the case of former sand pits that were operated near the water table. As indicated above, these micro-habitats could integrate very well into a habitat provided for caribou or moose.

SAND PIT A-10

QC-17.

The ecological inventory of the sites, presented in Appendix 4, mentions that the sand pit has been reprofiled so as to create a wetland at the centre. However, the reclamation of the site mentions that a plantation for Canada geese will be developed without a pond due to the proximity of the road. The proponent will have to assess the possibility of developing a marsh-type wetland (without a pond) where the topography is adequate. The plant species to be planted will have to be chosen based on this type of setting.

A-17. A water accumulation is visible in the photo of Sand Pit A-10. However, given the sandy soil type, these accumulations drain rapidly. The assessment of the plant species to be planted will be performed based on the type of setting and the topography. At this stage of the project, it is planned to plant species tolerant of wet soil so as to form a small marsh without a pond.

SAND PIT A-01-A

QC-18.

A sand martin colony was identified in Sand Pit A-01-A. If it is still present during the performance of the reclamation work, at the time of the mine closure, the proponent will have to conserve this habitat. It will also have to specify what mitigation measures it plans to deploy to minimize the disturbances of the colony inhabiting this sand pit.

A-18. If the stand martin colony is still present at the time of reclamation of Sand Pit A-01-A, the habitat will indeed be protected.

Mitigation measures are already implemented to reduce the impacts of operation of the sand pits on this species:

- Maintain slopes less than 70° for the sectors in operation (not conducive to nesting);
- Conduct inspections during the nesting period; if nests are identified, the sector is barricaded and operation of the sector is stopped for the duration of nesting.

ROAD SECTIONS R-1 AND R-2

QC-19.

The southern portion of this road section, on both sides of the road, shows organic soil typical of a bog. The proponent will have to assess the possibility of restoring circulation of water in this boggy portion during reclamation.

A-19. This possibility will be assessed and prioritized during preparation of the detailed plans of the reclamation sites.

ROAD SECTIONS R-3 AND R-4

QC-20.

A hardwood plantation is projected in road sections R-3 and R-4. However, according to the ecological inventory of the sites, presented in Appendix 4, a watercourse flows between these two road sections. The reclamation of these two sites will have to provide for stabilization by revegetation of the riparian strips on both sides of this water course, in addition to the hardwood plantation. This can prevent any potential release of sediments to the watercourse.

A-20. The banks of the streams crossing road sections R-1 and R-2, as well as R-3 and R-4, are stable, because of riprap installed during removal of the culvert. However, riparian shrubs will be planted in the riparian strip to naturalize the bank. This will be covered by the detailed plan of this sector.

ROAD SECTIONS R-10 AND R-12

QC-21.

It is specified in Table 28, that road section R-10 will remain as parking for the boats. In this context, the proponent may not account for this area as offset (0.2 ha).

Likewise, for road section R-12, the proponent shall specify, as applicable, what areas will be maintained as boat ramps and vehicle accesses (Table 28), in order to remove them from the areas accounted for as offset.

A-21. This is indeed an error in the calculation of the reclamation areas. These road sections will be retained as access for the tallymen. These areas (14,000 m2) must be removed from the sites to be reclaimed. These adjustments will be

integrated into the QH calculations, which will be performed along with the work and follow-ups associated with the implementation of the plan.

It must be known, throughout the lifecycle of the mine, that adjustments of the areas to be reclaimed and the areas of the wetlands impacted will have to be reassessed and updated. Indeed, concerning the area to be reclaimed, it is likely that certain infrastructures, such as road sections or others, will have to be left in place to respond to a request from the users of the territory. On the other hand, wetland areas have been taken into account for offsetting when they are not yet impacted. For example, with the Éléonore Mine's current reserves, construction of Phase 4 of the tailings storage facility would not be required. If this phase is not constructed, the areas not impacted will have to be removed from the QH calculations to be offset.

Consequently, both the areas to be reclaimed and the wetlands to be offset will be reviewed annually and presented in tabular form in the annual report.

ROAD SECTION R-11

QC-22.

The proponent will have to confirm that the section regenerated as wetland will be maintained as wetland.

A-22. This segment will be maintained as wetland and this will be specified in the detailed plans that will be prepared. At this time, an assessment is being conducted to agree whether it is preferable to plant vegetation or whether it is preferable to leave the segment as is.

FOLLOW-UP AND SUSTAINABILITY OF OFFSETTING PROJECTS

QC-23.

To ensure sustainable reclamation, the follow-up program will have to target a long enough period. However, there is no precision regarding the minimum number of years of follow-up. The term [TRANSLATION] "throughout the lifecycle of the mine" is imprecise and does not allow follow-up of the sites that will be reclaimed in Phase 3, mine closure. The proponent will have to specify concretely the follow-up that will be done to ensure the success and sustainability of the reclamation. The follow-up will also have to include the assessment of the offset for the loss of carbon sequestration.

A-23. GCL Éléonore undertakes to do follow-up for a period of at least 10 years after the end of reclamation. According to the current mining plan, the closure of the Éléonore Mine is scheduled for 2025. Reclamation of the site should last 3 years. According to this timeline, follow-up of offsetting would be conducted until 2038, 10 years after the end of reclamation. If the lifecycle of the Éléonore Mine is extended after the increase in reserves, the year the follow-up ends will be adjusted according to the principle described above. As indicated previously, the periodic assessments will allow assessment of the progress of the QH gains and the need for adjustment. Also, given that certain sectors are ready to be reclaimed, it will be possible to develop and improve the revegetation methodologies before closure of the mine.

Although the offsetting plan raises the subject of offsetting the loss of carbon sequestration, it does not present any commitment to offset all of these losses. However, a theoretical assessment of offsetting will be performed based on the types of stands and their density.

QC-24.

Some sites targeted by the offsetting projects are located outside the mining company's mining titles. This could jeopardize the sustainability of the projects carried out. The proponent will have to describe the additional measures that will be applied and the related timeline to obtain the agreement and adherence to the project of the stakeholders, including the rights holders on these sites.

A-24. The mining titles (claims) are only rights for mineral exploration or mining. They do not give any rights to the surface of the territory. Anyone may apply for an intervention licence to the MFFP for construction of a camp, a power line, a road or any other activity unrelated to the mineral rights. The companies that hold claims are never informed if an intervention licence is requested. It is not possible to manage protection of the territory by agreements with the exploration companies, especially since the claims regularly change holders. GCL Éléonore undertakes to give written notice to the current holders of the claims where the offsetting will be done that these sites are targeted for reclamation to offset the loss of wetlands and that they must be protected. Also, explanatory signs will be installed at the site entrances for information.

QC-25.

In the follow-up program, the proponent will have to study the use of the sites by the different wildlife species every three years to assess the biodiversity gains. Indeed, since the objective of offsetting is to create favourable habitats for certain species and specific ecological services, it would be essential to follow the biodiversity gains with other indicators than the QH gain alone. The use of the reclaimed sites by the species of interest and priority species should appear among the indicators related to biodiversity gains in Table 33 of the offsetting plan. This use could be quantified by the presence/absence of wildlife species of interest or by different types of wildlife inventories.

A-25. Table 33 of the offsetting plan submitted mentions that follow-up of biodiversity will be done every three years and will serve to calculate the QH gains. However for reasons of optimization of the external mandates and cost control, the frequency of follow-up of the biodiversity gains could be adapted (upward or downward), particularly during the first few years of offsetting. The administrator may refer to section 3.2.1 of the offsetting plan to find the different parameters associated with the calculation of Quality, one of the two components of the QH indicator. Parameters, such as uniqueness, conservation value, hydrological characteristics, structural and specific diversity, rare, threatened and invasive species (wildlife and plant), disturbances, enhancement and ecological services are all integral parts of the calculation of the Quality index. Plant and wildlife inventories, including presence/absence assessments, will be conducted periodically, but the details are not yet established. These inventories will serve to assess their frequenting of the reclaimed sites. This is a key parameter of the QH calculation.

QC-26.

To assess the possibility (or risk) of future operation of one of the sand pits covered by the offsetting plan, it is important to analyze whether extraction potential remains and to what degree, if applicable.

The proponent shall provide the UTM NAD 83 coordinates of the sand pits and the associated number of the lease to mine surface mineral substances. It shall also provide photographs of the condition of each site before the beginning of the redevelopment work to assess the remaining potential.

A-26. Table 2 presents the coordinates (UTM NAD 83), the mining lease numbers associated with the different active borrow pits and a summary of the extraction potential. A photographic report is presented in Appendix 1. In general, the sand pits along the road offered very limited potential. The only sand pit that offered quality material is still in operation (R-30B). All the others, for which the leases have not been renewed, were either depleted or too close to the water table, or the substantial presence of boulders made operation very difficult and costly. Some were very little operated for these reasons. It is unlikely that these former sand pits will interest future users.

BNE: Non exclusive lease

BEX: Exclusive lease

Table 2: Coordinates, lease number and extraction potential of borrow pits

Nomenclature			Location:					Characteristic
Deposit type	Deposit name	BNE/BEX No.	Location (Km)	Sheet	Central coordinates of the deposit		Status	Extraction potential
					UTM Nad 83 Zone 18			
					North	East		
Sand pit	Borrow Pit A-01	BNE 38971	Éléonore site	33C09	5,840,998	422,187	Active	In operation
	Borrow Pit A-02	NA	Éléonore site	33C09	5,840,775	426,310	Reused	Depleted. Location of the core library
	Borrow Pit A-08	NA	57 + 500	33C09	5,840,988	430,644	To be reclaimed	Reserves depleted, near the water table or near a rocky outcrop
	Borrow Pit A-09	NA	53 + 200	33B12	5,843,187	433,987	To be reclaimed	Underexploited Very poor quality material - many rocks
	Borrow Pit A-10	NA	52 + 300	33B12	5,843,748	433,633	To be reclaimed	Reserves depleted, near the water table
	Borrow Pit R-30-A	NA	46 + 800	33C09	5,844,175	429,292	To be reclaimed	Reserves depleted, near the water table
	Borrow Pit R-34-A	NA	29 + 000	33C09	5,844,988	414,399	To be reclaimed	Reserves depleted, near the water table
	Borrow Pit R-36-C	NA	11 + 000	33C10	5,845,101	398,052	To be reclaimed	80% operated - Depleted Poor quality material - Many rocks
	Borrow Pit R-38-B	NA	4 + 000	33C15	5,846,565	392,429	To be reclaimed	50% operated - Depleted Poor quality material - Many rocks Requires a lot of effort to access the sand
	Borrow Pit R-40	NA	0 + 600	33C10	5,843,795	390,958	To be reclaimed	15-20% operated Poor quality material - Many rocks Requires a lot of effort to access the sand Difficult to access

Nomenclature			Location:				Characteristic	
Deposit type	Deposit name	BNE/BEX No.	Location (Km)	Sheet	Central coordinates of the deposit		Status	Extraction potential
					UTM Nad 83 Zone 18			
					North	East		
Sandpit	Borrow Pit R-30-B	BNE 37486	47 + 000	33C09	5,844,040	428,086	Active	Still in operation
	Borrow Pit R-36-B	NA	12+ 000	33C09	5,844,816	399,464	To be reclaimed	60% operated - Depleted Poor quality material - Many boulders Requires a lot of effort to access the sand
	Borrow Pit R-44	NA	16 + 000	33C09	5,844,011	402,927	To be reclaimed	60% operated - Depleted Poor quality material - presence of gravel and rocks Requests a lot of effort to access the sand; it is easier to use the material from the adjacent quarry
	DGR 25 O	NA		33C10	5,289,865	290,331	Retroceded	Retroceded to SEBJ*
	DGR 25 E	NA		33C10	5,830,192	290,784	Retroceded	Retroceded to SEBJ*
Quarry	C-01	NA	Éléonore site	33C09	5,840,594	423,943	Reused	Deplete because located on the perimeter of the Éléonore tailings storage facility
	C-02	BEX 1129	57 + 000	33C09	5,840,711	429,631	Active	Still in operation
	C-04	BEX 1153	28 + 000	33C09	5,844,373	413,539	Active	Aggregate piles present - Still in operation
	C-05	BEX 1097	16 + 000	33C09	5,844,011	403,237	Active	Aggregate piles present - used for road maintenance – Still in operation
	C-07	BEX 1125	6 + 000	33C15	5,846,550	394,417	Active	Aggregate piles present - used for road maintenance – Still in operation
	C-11	NA	47 + 000	33C09	5,844,485	427,863	Not operated	No reclamation necessary, never operated

* Société d'énergie de la Baie James (SEBJ)

QC-27.

The proponent particularly proposes the creation of an Indigenous and community conserved area (ICCA) to award protected status ensuring the sustainability of its projects. However, it is mentioned to the proponent that an ICCA does not have legal recognition in Québec, under the laws and regulations in force.

A-27. In the application for approval of the offsetting plan, GCL Éléonore also referred to s. 13 of the Natural Heritage Conservation Act (C-61.01). According to this section, the Minister has the power to protect natural settings. GCL Éléonore admits that it is important to preserve the sites where the offsetting will be carried out. However, this responsibility cannot be assigned to the proponent, because it has now power over management of the territory.

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Appendix 1

Photographic Report of Borrow Pits

OFFSETTING PLAN

Photographic Report of Borrow Pits

Last update
October 31, 2020

France Trépanier et Andrée Poirier
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1. General Information

The photographic folder of all of the borrow pits and their extraction potential is presented in this document. Appendix 1 presents two (2) location maps of the borrow pits.

2. Borrow Pits

The following section presents an executive summary of the observations documents during visits to the quarries and sand pits and sampling of the sand pits. The documentation comes from different field inspections conducted in 2019 and 2020.

On July 10, 2019, an inspection was conducted by Marjorie Bujold, Environmental Specialist for GCL, and Geneviève Pepin, Director of Sustainability and External Relations for GCL Éléonore. All of the borrow pits were inspected, except for C-02, which was in operation at the time of the inspection.

On June 27, 2020, inspection and sampling were conducted by Claude Marquis, Environmental Technician for GCL Éléonore, and William Fresser, Environmental Specialist for GCL Éléonore. A total of 5 sand pits were inspected and sampled: R-40, R-38B, R36C, R36B and R44. The objective of the inspection and sampling was to determine the particle size analysis of the surface layer of the site and the characterizations (e.g. presence of water, slope, soil type) of these sand pits.

On August 29 and 30 and September 23, 2020, inspections were conducted by France Trépanier, Consultant responsible for reclamation for GCL Éléonore, mostly accompanied by Alexandre Couturier, Project Manager for Viridis Terra International (VTI), Pierre Lafond, Agri-environmental Engineer for VTI, and Geneviève Pepin. All of the borrow pits were inspected, except for C-02, where work was in progress during this period. The objective of these inspections was to plan reclamation and offset with VTI.

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2.1. Sand Pit R-40

Location: km 0 + 600
Extraction potential:

- Underexploited (15-20% of the lease, Figure 1)
- The crushed rock pile present in Figure 2 was spread over 50% of the extracted area (Figure 3).
- Poor quality material, many rocks. Requires a lot of effort to access the sand (Figures 1 and 4).

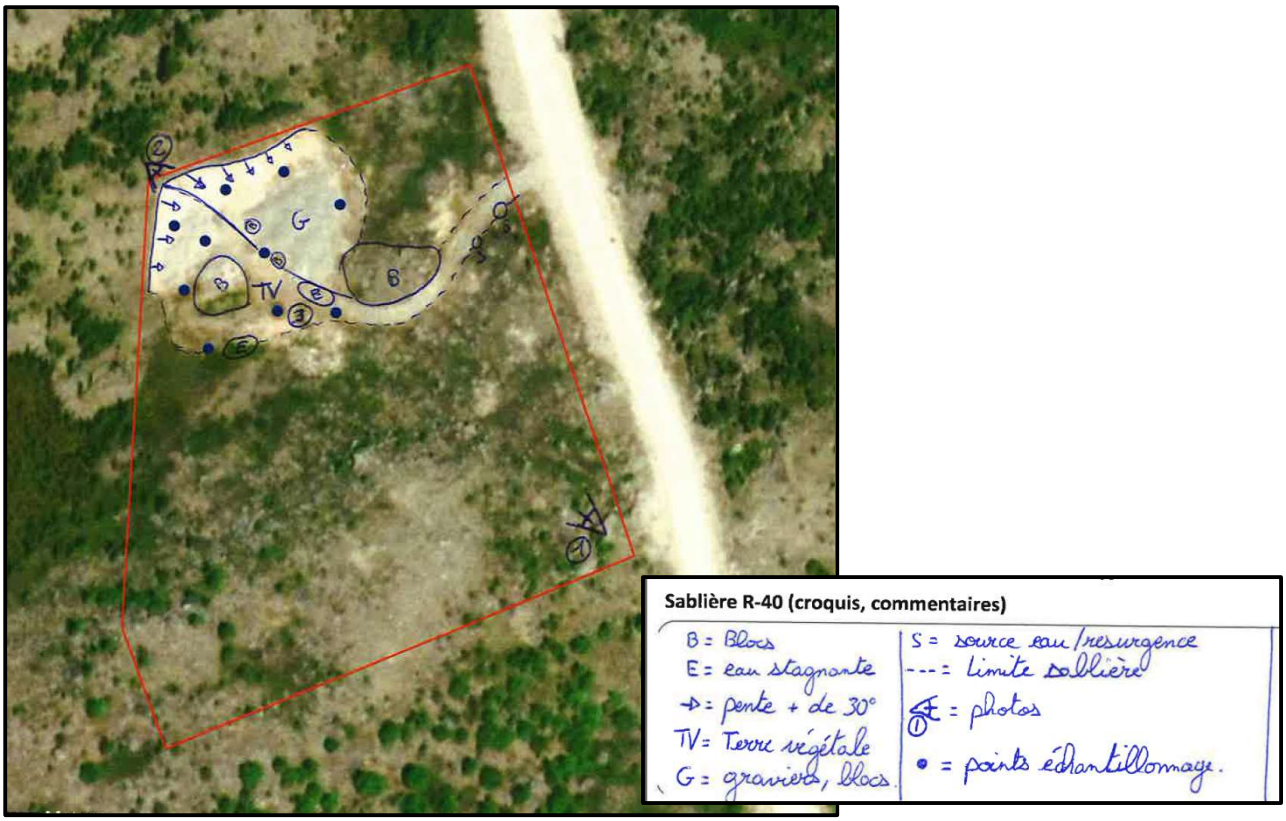

Figure 1: Aerial photo of Sand Pit R-40 and summary of the characteristics observed (Sand Pit Sampling Report, 2020-06-28)

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Figure 2: Crushed material stored at R-40 (Inspection, 2019-07-10)

Figure 3: Overview of Quarry R-40 after the crushed rock pile was spread (Sand Pit Sampling Report, 2020-06-28)

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Figure 4: Rock pile at R-40 (Inspection, 2020-08-29)

2.2. Sand Pit R38-B

Location: km 4 +000
Extraction potential:

- Sand pit operated for approximately 50% of the lease (Figure 5)
- Poor quality material, many rocks. Requires a lot of effort to access the sand (Figures 6 and 7).

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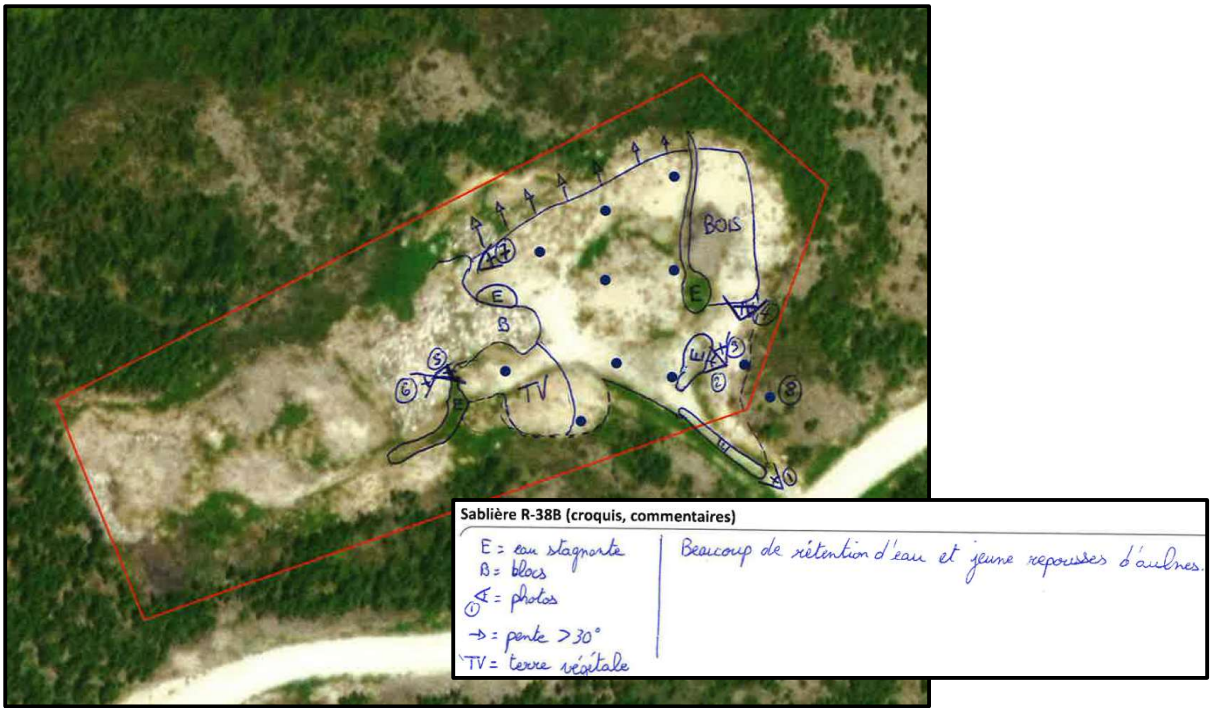

Figure 5: Aerial photo of Sand Pit R-38-B and summary of the characteristics observed (Sand Pit Sampling Report, 2020-06-28)

Figure 6 and Figure 7: Rock pile in Sand Pit R38-B (2019-07-29)

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2.3. Quarry C-07

Location: km 6 + 000
Extraction potential:

- Active quarry (BEX exclusive lease valid up to March 19, 2024)
- Significant presence of aggregate. Pit run pile coming from both sides of the road and crushed rock pile (Figure 8)
- Presence of a former road section to be reclaimed

.

Figure 8: Material present for future use (2019-07-10)

2.4. Sand Pit R36-C

Location: km 11 + 000
Extraction potential:

- Sand pit operated for approximately 80% of the lease (Figure 9)
- Poor quality material, many boulders. Requires a lot of effort to access the sand. Near the water table (Figure 10).
- Crushed rock piles were also spread over nearly 50% of the extracted area (Figure 11).

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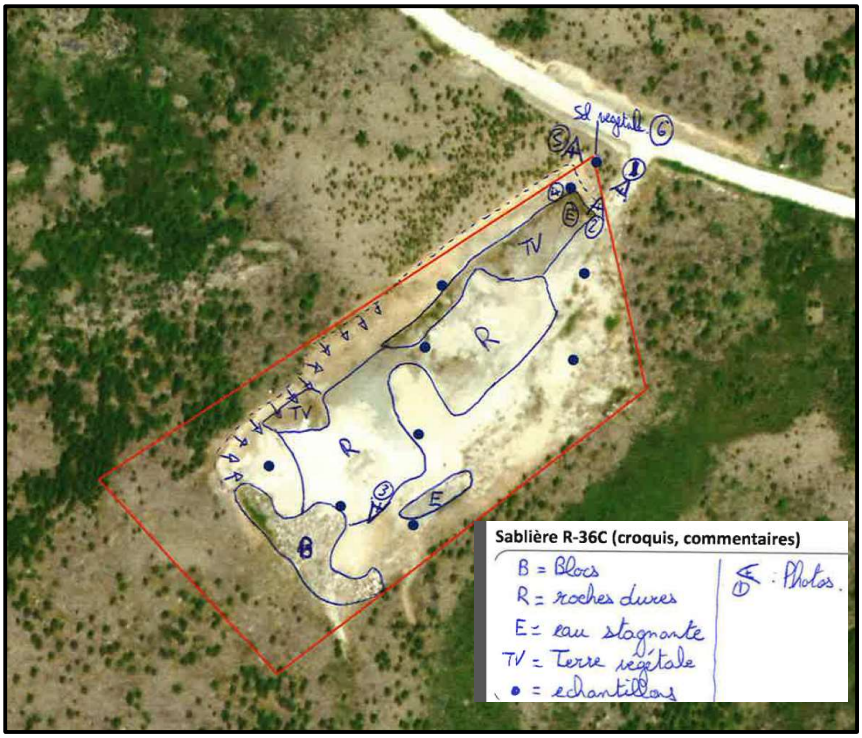

Figure 9: Aerial photo of Sand Pit R36-C and summary of the characteristics observed (Sand Pit Sampling Report, 2020-06-28)

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Figure 10: Small water pond (monitoring of quarries/sand pits, 2020-08-29)

Figure 11: Graded sand pit and spread crushed rock (monitoring of quarries/sand pits, 2019-07-10)

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2.5. Sand Pit R36-B

Location: km 12 + 000
Extraction potential:

- Sand pit operated for approximately 60% of the lease (Figure 12)
- Poor quality material, many rocks (Figure 13). Requires a lot of effort to access the sand.

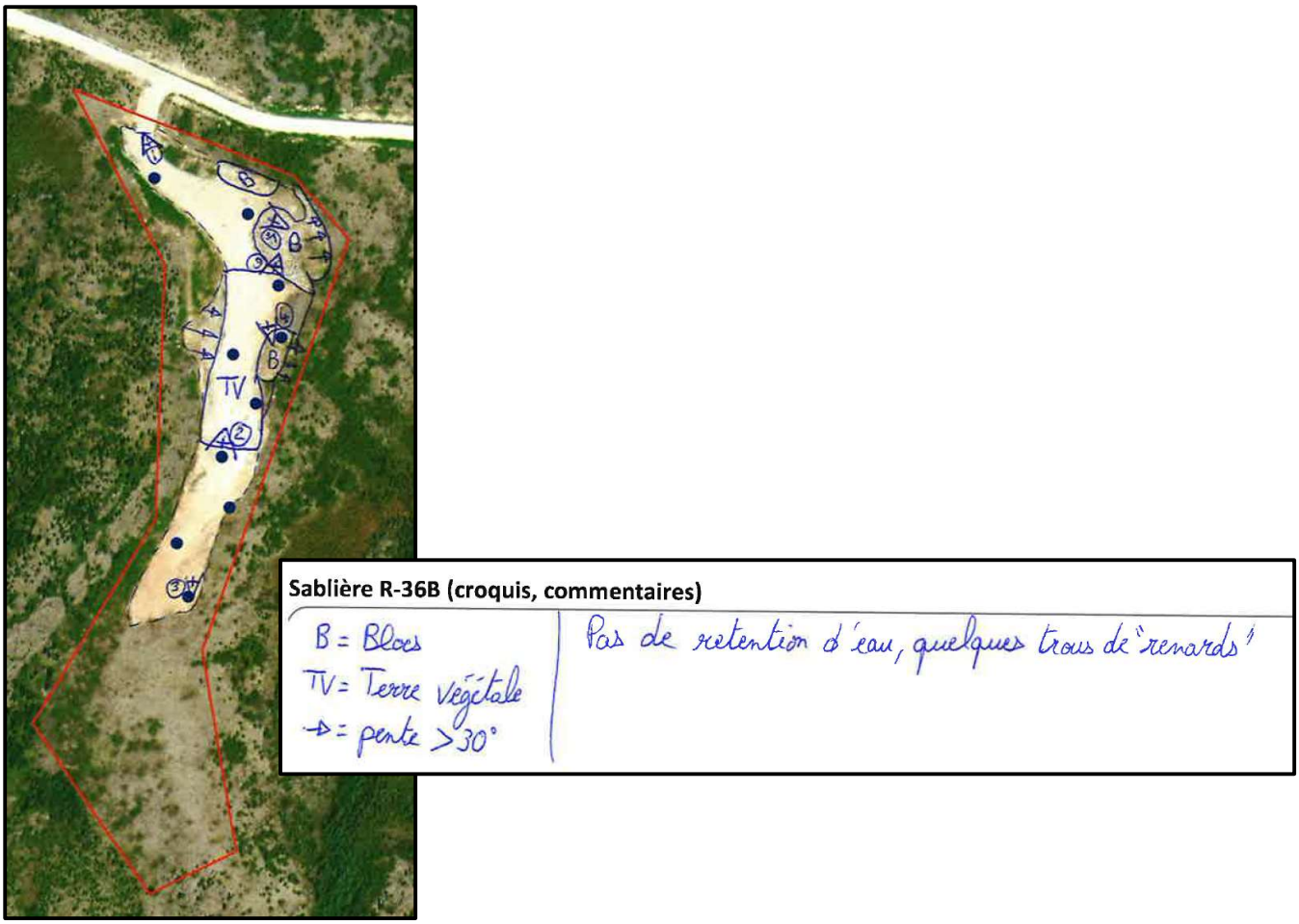

Figure 12: Aerial photo of Sand Pit R36-B and summary of the characteristics observed (Sand Pit Sampling Report, 2020-06-28)

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Figure 13: Presence of many rocks in Sand Pit R36-B (Sand Pit Inspection Report, 2019-07-10)

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2.6. Sand Pit R-44

Location: km 16 + 000
Extraction potential:

- Sand pit operated for approximately 60% of the lease (Figure 14)
- Medium quality material, presence of a large quantity of pebbles and coarse gravel (Figures 15 to 17).
- Requires a lot of effort to access the sand; it is easier to use the material from the adjacent quarry.

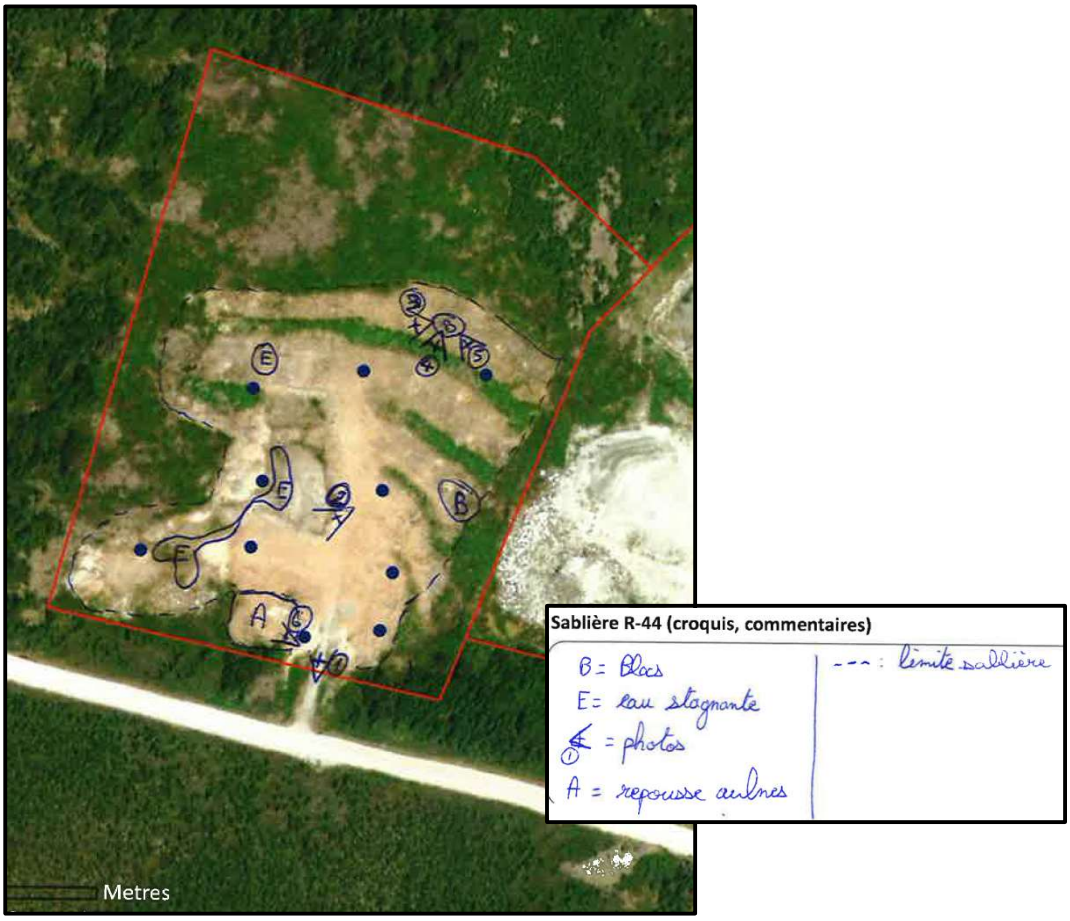

Figure 14: Aerial photo of Sand Pit R-44 and summary of the characteristics observed (Sand Pit Sampling Report, 2020-06-28)

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Figures 15 and 16: Presence of a large quantity of pebbles and gravel (2019-07-10)

Figure 17: Presence of a large quantity of pebbles and gravel (2019-07-10)

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2.7. Quarry C-05

Location: km 16 + 000
Extraction potential:

- Crushed rock piles remain. Material from this quarry is still used for maintenance of the nearby road (Figure 19)
- Presence of rocks and blasted material (Figures 20 and 21)

Figure 18: Aerial photo of Sand Pit R-44 (Sand Pit Sampling Report, 2020-06-28)

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Figure 19 : Aggregate pile (2019-07-10)

Figure 20: Blasted material pile (2019-07-10)

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Figure 21: View of berms and rocks (2020-08-29)

2.8. Quarry C-04

Location: km 28 + 000
Extraction potential:

- Still in operation
- Enormous untapped blasting (Figure 22)

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Figure 22: View of untouched blasting (2020-08-29)

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2.9. Sand Pit R34-A

Location: km 29 + 000
Extraction potential:

- Empty sand pit, near the water table (Figures 23 to 25)

Figure 23: View of the central section with water accumulation (2020-08-29)

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Figure 24: View of the East section (2020-08-29)

Figure 25: View of the West section (2020-08-29)

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2.10. Sand Pit R30-B

Location: km 47 + 000
Extraction potential:

- Sand pit still in operation and presence of pebbles and rocks (Figure 26)

Figure 26: View of the sand pit and pile of pebbles and rocks to be used (2020-08-29)

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2.11. Sand Pit R30-A

Location: km 46 + 800
Extraction potential:

- No potential. Water table very close to the surface, water accumulation. (Figure 27)

Figure 27: View of Sand Pit R30-A and extent of water (2020-08-29)

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2.12. Sand Pit A-10

Location: km 52 + 300
Extraction potential:

- Empty sand pit, very close to the water table. Permanent presence of water (Figure 28)

Figure 28: General view of Sand Pit A-10 and extent of water (2020-09-23)

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2.13. Sand Pit A-09

Location: km 53 + 200
Extraction potential:

- Sand pit very underexploited
- Poor quality material, many rocks. Requires a lot of effort to access the sand. Several unsuccessful surveys were conducted to verify the quality of the materials (Figures 29 to 31).

Figure 29: Overview of Sand Pit A-09 and rocks (2020-09-23)

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Figure 30: Overview of Sand Pit A-09 and boulders (2020-09-23)

Figure 31: Overview of Sand Pit A-09 and rocks (2020-09-23)

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2.14. Sand Pit A-08

Location: km 57 + 500
Extraction potential:

- Sector South of the road: sand pit 100% extracted because of poor quality material. Seems empty because of rocky outcrops (Figures 32 and 33) and extracted down to the water table.
- North of the road: sand pit very underexploited because of poor quality material and water table very close to the surface (visible ruts) (Figure 34).

Figure 32: Overview of the South sector of Sand Pit A-08 and rocky outcrop on the right (2020-09-23)

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Figure 33 : Overview of the South sector of Sand Pit A-08 (2020-09-23)

Figure 34: Overview of the North sector of Sand Pit A-08 (2020-09-23)

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2.15. Quarry C-02

Location: km 57 + 000
Extraction potential:

- Still in operation

2.16. Sand pit A-01

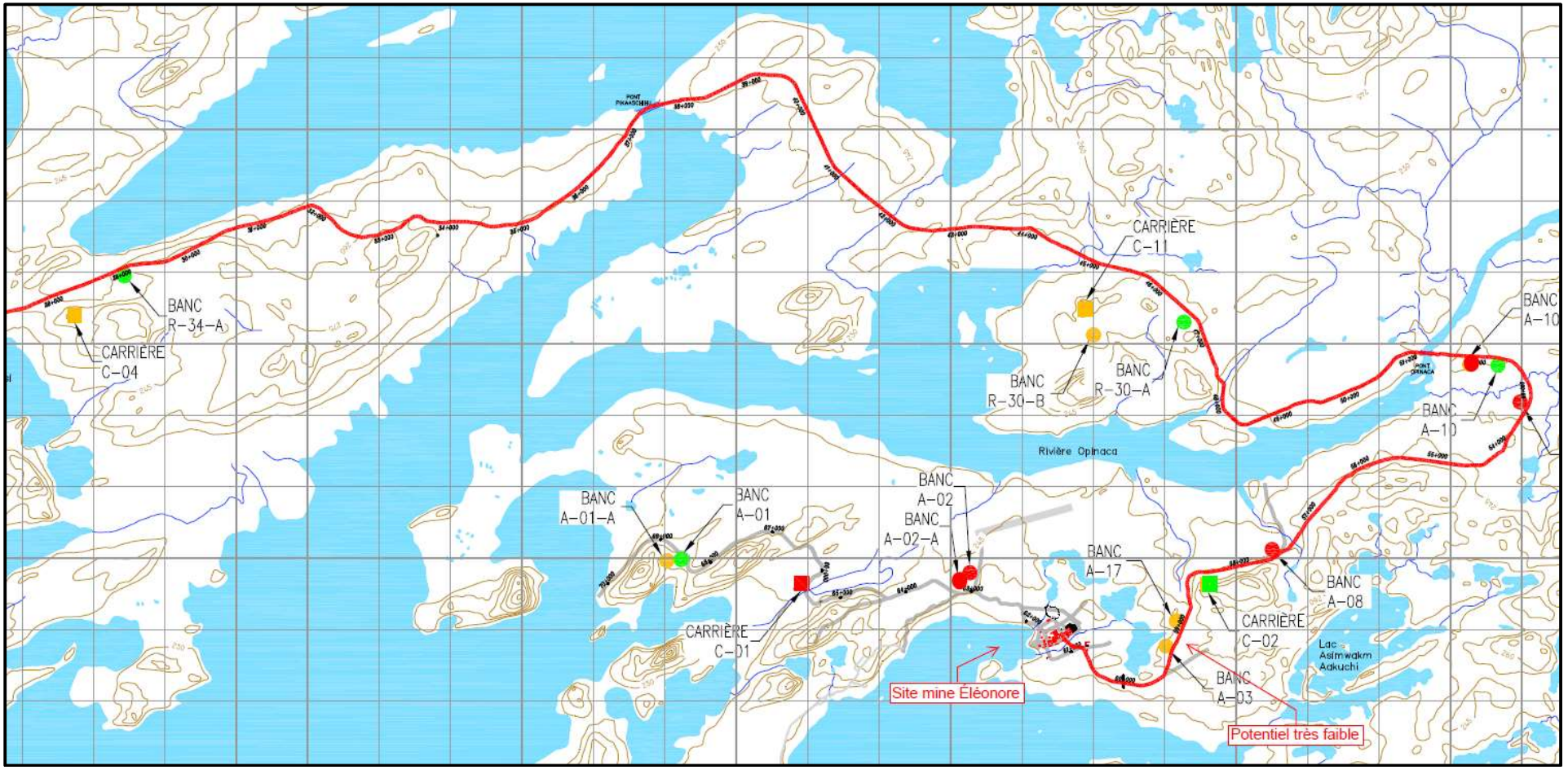
Location: km 57 + 000
Extraction potential:

- Still in operation

Appendix 1

Location Maps of Quarries and Sand Pits


CARRIÈRE
C-07
BANC
R-38-B
BANC
R-40
BANC
R-36-C
BANC
R-36-B
CARRIÈRE
C-05
BANC
R-44
Lac Kawasaydakml
Lac Wapakusi
Baie Wapakw
Réservoir Opinaca


BANC
R-34-A
CARRIÈRE
C-04
CARRIÈRE
C-11
BANC
R-30-B
BANC
R-30-A
BANC
A-10
BANC
A-10
Rivière Opinaca
BANC
A-01-A
BANC
A-01
BANC
A-02
BANC
A-02-A
BANC
A-17
BANC
A-08
CARRIÈRE
C-01
CARRIÈRE
C-02
Lac
Asimwakm
Adkuchi
Site mine Éléonore
BANC
A-03
Potentiel très faible