DOMINION DIAMOND

April 17, 2015

Mackenzie Valley Environmental Impact Review Board
200 Scotia Centre
P.O. Box 938
Yellowknife, NT
X1A 2N7

Attention: Chuck Hubert, Senior Environmental Assessment Officer

Re: EA1314-01 Jay Project, Additional information requests in preparation for technical session

Dear Mr. Hubert:

In response to the letter issued by the Mackenzie Valley Environmental Impact Review Board (MVEIRB), dated April 10, 2015, please find attached the following additional information request (IR) responses for the Jay Project:

1. Sensory disturbance to caribou (Assigned Document Code: DAR-MVEIRB-IR-108)

2. The A21 Pipe at the Diavik Diamond Mine and scheduling of development activities in the Lac de Gras basin (Assigned Document Code: DAR-MVEIRB-IR-109)

We look forward to addressing any further concerns as part of the Technical Sessions occurring next week April 20 to April 24.

Regards,

Richard Bargery
Manager, Permitting Jay Project
Dominion Diamond Corporation

Attach.

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Information Request Number: DAR-MVEIRB-IR-108

Source: Additional MVEIRB Information Requests from JoAnne Deneron

Subject: Sensory disturbance to Barren-ground Caribou

DAR Section(s): 12

Preamble (MVEIRB):

The Mackenzie Valley Review Board (Review Board) met on April 9, 2105 to review the status of the information request phase and to ensure sufficient information is available to maximize efficiencies at the technical session April 20-24.

One of the key issues with the Jay Project is impacts to caribou behavior, energetics and movement due to sensory disturbance, and potential mitigation options to reduce those impacts. Sensory disturbance is a response to stimuli from the project. Caribou have been present in large numbers in September and October, when the mine is visible from a distance at night. Discussions at the upcoming technical session will be more productive if the Review Board and parties have an understanding of 1) how far the mine can be seen from (the Review Board has that information already for sound), and 2) what options exist to focus light where it is needed while limiting light (and noise) pollution.

Request (MVEIRB):

a) Please describe or estimate the distance on the tundra from which light from current operations is visible at night.

b) Please describe possible mitigations for the Jay Project to reduce noise and light pollution that have been successfully implemented at Ekati or other industrial sites.

Response:

The light sources associated with the current operations may potentially be visible at nighttime from as far away as 30 kilometres (km) or beyond depending on the line of sight, topography of the area, and weather conditions. However, the amount of light that reaches areas surrounding light sources is directly dependent on the viewing angle and reduces with the square of the distance from the light sources (i.e., the amount of light reaching a given area decreases rapidly with distance from the source). Light trespass and sky glow are the parameters used to assess the potential changes in light levels attributable to a project according to the Illuminating Engineering Society of North America (IESNA) and International Commission on Illumination (CIE) guidelines. Light trespass can be described as the amount of light or illuminance that strays from its intended purpose onto neighbouring areas. Sky glow is the unwanted illumination of the night sky due to the scattering and reflection of light rays.

The illuminance from light sources are used to establish the level of light trespass at points of interest surrounding a project according to the inverse square law described as follows:

$$E = \frac{I}{D^2}(\cos\theta)$$

Where:

E = illuminance at the point of interest (lm/m^2 = lux);

I = luminous intensity (candelas [cd]);

D = distance to POR (m); and,

θ = angle between the light ray and the normal to the surface of interest (degrees).

No scientific research could be found indicating how barren-ground caribou respond to anthropogenic sources of light. The current estimated zone of influence is 14 km around development and represents a change in caribou distribution relative to sensory disturbances emanating from the Ekati and Diavik mines (Boulanger et al. 2012). The estimated zone of influence accounts for the cumulative effects of all sources of sensory disturbance including light, noise, dust, smells, viewscape and presence of humans. Even if individuals are able to sense or perceive light, dust, noise, smells, and viewscape at distances greater than 14 km, changes in caribou distribution have been detected within 14 km. The Developer's Assessment Report (DAR) used a conservative 15 km zone of influence around all mining developments, including the Project, to maximize predicted changes to seasonal quality habitats.

Mitigation applied to sources of sensory disturbance, including noise and light, is provided in Table 12.3-1. Some examples of mitigation include: the use of existing Ekati Mine infrastructure for the Jay Project, which will minimize new sources of noise and light (and other sources of sensory disturbance); and modifications of traffic patterns on haul roads to reduce or avoid noise and lights (and other sources of sensory disturbance) associated with traffic, if necessary, to protect caribou on roads. Additional information on noise and caribou is provided in the response to DAR-MVEIRB-IR-98. Sources of fixed exterior lighting at the Ekati Mine are directed at working surfaces and headlights on vehicles at driving surfaces for safety reasons. This will also apply to the lighting for the Project.

References:

Boulanger J, Poole KG, Gunn A, Wierzchowski J. 2012. Estimating the Zone of Influence of Industrial Developments on Wildlife: a Migratory Caribou *Rangifer tarandus groenlandicus* and diamond mine case study. Wildlife Biol 18: 164-179.

CIE (Commission Internationale de l'Eclairage). 1997. Technical report: guidelines for minimizing sky glow. CIE 126:1997, ISBN 978 3 900734 83 1. Vienna, Austria.

IESNA (Illuminating Engineering Society of North America). 2000. Light trespass: research, results, and recommendations, IESNA TM-11-2000. Prepared by the Obtrusive Light Subcommittee of the IESNA Roadway Lighting Committee. New York: Illuminating Engineering Society of North America.

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Information Request Number:	DAR-MVEIRB-IR-109
Source:	Additional MVEIRB Information Requests from JoAnne Deneron
Subject:	The A21 Pipe at the Diavik Diamond Mine and scheduling of development activities in the Lac de Gras basin
DAR Section(s):	12

Preamble (MVEIRB):

The Mackenzie Valley Review Board (Review Board) met on April 9, 2105 to review the status of the information request phase and to ensure sufficient information is available to maximize efficiencies at the technical session April 20-24.

Diavik recently opted to pursue its A21 pipe which changes the number of current and potential projects impacting the Lac de Gras basin. Details about A21 and its predicted impacts to Lac du Gras are not on the Review Board's registry at this time.

Request (MVEIRB):

a) To assist with the cumulative effects assessment, please provide the A21 dike 2014 Design Report Update.

b) To help the Review Board and parties understand the potential cumulative effects to the Lac de Gras basin it would be helpful to have a Gantt chart outlining the timing of current or proposed pit development within the Lac de Gras basin. At a minimum, it should include the key construction dates for each pit (construction and dewatering, operation as an open pit, operation as an underground, closure) and key water pumping times (if pits are to be refilled with water, the date filling starts and finishes, when pumping from the pits to the Lac de Gras basin will start and finish).

Response:

a) The A21 Dike 2014 Design Report Update can be located at the following location on the Wek'èezhìi Land and Water Board site:

http://www.mvlwb.ca/Boards/WLWB/Registry/2007/W2007L2-0003/Reports/W2007L2-0003%20-%20Diavik%20-%20A21%20Dike%20Design%20Report%20-%20Jan%205_15.pdf

b) Information on pit refilling with and without the Jay Project is included in Appendix G of the Information Requests. Additional information for Jay Project components is provided in Table 109-1 below. There are no anticipated overlapping water withdrawal or additions. Note that the Ekati Mine water withdrawal/additions shown are not directly to/from Lac de Gras, but do occur within the catchment area.

Table 109-1 Conceptual Schedule For Pit Area Dewatering And Pit Back-flooding in Lac de Gras Catchment

	2015	2016	2017		2018		2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
EKATI MINE																						
mine operations																						
pit area dewatering	Lynx						Jay															
pit back-flooding								Lynx							Sable (RFD) could begin 2026					All remaining pits begin 2031		
DIAVIK MINE																						
mine operations																						
pit area dewatering				A21 (RFD)																		
pit back-flooding													all									

Notes:
This conceptual schedule is intended to be read in conjunction with Appendix G of Dominion Diamond's Response to Information Requests dated April 7, 2015.
Ekati Mine operations timeframe assumes approval of the Jay Project.
RFD = Reasonably Foreseeable Development; RFD project for the Jay Project Environmental Assessment.
Diavik Mine A21 pit area dewatering from DDMI 2015; Diavik Mine pit flooding timeframe assumed.

References:

DDMI (Diavik Diamond Mines Inc.) 2015. DDMI Comment Responses - A21 Dike Submission. Provided to Wek'èezhíi Land and Water Board. March 5, 2015.