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March 25, 2019

New Brunswick Department of Environment and Local Government
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Attention: Ms. Cassandra Colwell
Project Manager, Environmental Impact Assessment Branch

RE: Hammond River Holdings' Response to Technical Review Committee (TRC) Questions and Comments Round #3 – Proposed Upham East Gypsum Quarry, EIA Registration Document File No. 4561-3-1508

Hammond River Holdings Limited (Hammond River Holdings) has reviewed and addressed the comment provided by the Technical Review Committee (TRC) in its letter dated March 13, 2019 for the Proposed Upham East Gypsum Quarry Environmental Impact Assessment (EIA) registration document (registered on November 2, 2018).

QUESTION FROM TRC:

The following question was provided to Hammond River Holdings by the TRC:

"23. Although the responses provided indicate that a compensation plan for the loss of regulated wetlands will be developed, can you please, at this time, propose mitigative actions, based on the results of the functional assessment, for the unmapped wetlands that will be lost as a result of the project?"

HAMMOND RIVER HOLDINGS' RESPONSE:

There are a total of 12 unregulated (unmapped, field-identified) wetlands and one regulated (mapped) wetland on the Project site. As detailed in Table 5.5.2 of the EIA registration, the Project will result in the direct loss or alteration of 10 unregulated wetlands and one mapped (regulated) wetland, along with their functions (i.e., through the development of the open pit and other site facilities/infrastructure). A total of 4.78 ha of wetlands on the Project site will be directly lost. Wetlands WL8 and WL9 are not expected to be directly affected by the Project.

It should be noted that one wetland (i.e., WL3) is mapped (regulated). The portion of WL3 that appears on the Project site has been delineated and functionally assessed in 2018. However, this wetland extends off of the Project site to a neighbouring property to the northeast of the site, and due to commercial confidentiality concerns, landowner

permission could not be obtained in 2018 to access this wetland in order to complete a delineation and functional assessment. Subject to landowner permission being obtained, the portion of WL3 that extends off the Project site will be delineated and functionally assessed through the WESP-AC protocol in 2019. The net direct loss of functions for this wetland will be addressed through the application for a watercourse and wetland alteration (WAWA) permit and a wetland compensation plan (to be submitted to the TRC for review), and indirect losses of wetland function will be addressed through follow-up and adaptive management.

Potential mitigation measures for net loss of wetland function that is expected to occur to the 10 unregulated (unmapped) wetlands have been developed below. These and other potential feasible mitigation measures will be considered for implementation, as appropriate and in consultation with NBDELG, as part of the Project or as follow-up and an adaptive management measure for net losses of wetland function that might occur. The potential mitigation measures below are organized by key wetland functions that were identified as part of the Wetland Ecosystems Services Protocol-Atlantic Canada (WESP-AC) functional assessment for the identified wetlands. It is important to note that not all of these mitigation measures may be implemented to address the loss of key wetland functions; the listing below is for measures that could be considered for implementation as appropriate. A site-specific evaluation of each wetland will be conducted prior to construction to determine the best mitigation measures for implementation for each wetland based on the planned development of the area it covers and the key functions it provides, with consideration provided for implementation of the mitigation measures.

Key functions and potential mitigation measures that could be implemented for the 10 unregulated wetlands that will be directly affected by the Project are as follows. It should be noted that mitigation measures other than those outlined in this letter may be developed and implemented as the Project design and plan develops, upon further consultation with NBDELG.

Key WESP-AC Wetland Functions #1 (Water Storage and Delay), #2 (Stream Flow Support), and #4 (Sediment Retention and Stabilization)

To mitigate the loss or alteration of the water storage and delay, stream flow support, and sediment retention and stabilization wetland functions, the following mitigation measures will be considered for implementation (as appropriate) as part of the Project:

- As discussed within the second round of TRC Responses dated February 22, 2019, a detailed water management plan is being developed for the site. This plan will factor into the management of the water on-site. An updated

conceptual site layout plan that has evolved since the preparation of the EIA registration document is attached. For ease of review by the TRC, we have overlaid the wetland layer for mapped and field-identified wetlands and watercourses on this updated site layout plan.

- A berm will be developed surrounding the open pit to provide containment for runoff off and onto the site. The berm specifications will be developed and submitted to NBDELG following detailed design of the Project, as part of the application for the Approval to Construct. The berm is planned to be constructed of on-site topsoil and overburden with a natural seed mix cover.
- The water management plan is currently being developed for the site, and at a high level, consists of a plan for the collection of water from the quarry in a pit sump and the collection of runoff from the storage pad areas in the retention (settling) ponds. The water will be pumped into the retention ponds (discussed below). When the retention ponds are at or near capacity or during extreme weather events, water within the quarry would not be pumped to the retention ponds but rather contained in the pit sump until water levels in the ponds have receded to a suitable level to resume pumping.
- In addition to the pit sump at the bottom of the quarry, two retention (settling) ponds have been added to the design: the West retention pond (receiving runoff from Areas A and B of the quarry), and the East retention pond (receiving runoff from Area C of the quarry as well as from the access road and the West, Northeast, and Southeast storage pads). The retention ponds have been repositioned and subdivided into two sub areas to improve alignment with a topographic low on the property. The West retention pond will discharge into the East retention pond, providing additional retention capacity, with both retention ponds discharging to a common location into watercourse WC3. It is noted that the pit sump will now discharge to the retention ponds instead of being pumped directly into watercourse WC1.
- The orientation of the retention ponds has been optimized based on runoff calculations for the refined quarry footprint, storage pad areas, and LiDAR data.
- Construction techniques for the pit sump, retention ponds, and potential spillway structure(s) will follow the erosion, sediment and water control measures as outlined in the NBDELG's Watercourse and Wetland Alteration Technical Guidelines (2012).
- Hammond River Holdings will consider the naturalization of the retention ponds to include plantings of native vegetation where possible (i.e., more diverse and natural habitat characteristics that will aid in water storage).
- Proper erosion and sediment control measures (following the WAWA technical guidelines) will be properly installed where necessary around the gypsum storage pad and overburden/topsoil storage pads (upgradient of

wetlands/watercourses) and at the discharge points. They will be checked regularly, prior to and after storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent or receiving aquatic habitats.

The storage capacity of the open pit is expected to be large relative to the disturbed area such that there would be ample capacity in the pit sump to store water infiltrating into the pit. The design parameters for a water management plan are undergoing a more detailed review, and the findings will be submitted to NBDELG for review under the application for an Approval to Construct.

Key WESP-AC Wetland Function #3 (Water Cooling)

To mitigate the loss or alteration of the water cooling wetland function, the following mitigation measures will be considered for implementation (as appropriate) as part of the Project:

- Efforts will be made to maintain as much mature vegetation on-site as possible; in particular, existing treed buffers surrounding wetlands located on the southeastern and southwestern portions of the site will be maintained to the extent possible.
- Planting of native trees and shrubs will be implemented as a part of the reclamation and closure plan.

Key WESP-AC Wetland Functions # 5 (Phosphorus Retention), #6 (Nutrient Removal and Retention), and #7 (Organic Nutrient Transport)

The mitigation measures proposed for functions: #1 (Water Storage and Delay), #2 (Stream Flow Support), #3 (Water Cooling), and #4 (Sediment Retention and Stabilization) are expected to mitigate the loss or alteration of functions: # 5 (Phosphorus Retention), #6 (Nutrient Removal and Retention), and #7 (Organic Nutrient Transport). No other specific mitigation measures for these functions are proposed for consideration at this time.

Key WESP-AC Wetland Functions #8 (Fish Habitat), #9 (Aquatic Invertebrate Habitat), #10 (Amphibian and Reptile Habitat), #11 (Waterbird Feeding Habitat), and #12 (Waterbird Nesting Habitat)

To mitigate the loss or alteration of the fish habitat, aquatic invertebrate habitat, amphibian and reptile habitat, waterbird feeding habitat, and waterbird nesting habitat

wetland functions, the following mitigation measures will be considered for implementation (as appropriate) as part of the Project:

- Refer to mitigation for the loss/alterations of the above wetland functions (which influence aquatic habitat and fauna).
- Hammond River Holdings will consider the naturalization of the retention ponds to include plantings of native wetland vegetation, and where possible, stratified depths that offer more diverse and natural habitat characteristics favorable to encourage aquatic fauna growth and health.
- Naturalization techniques that lead to habitat characteristics favoured by aquatic fauna will be considered for implementation into the Project and the reclamation and closure plan for the site (e.g., native wetland/aquatic vegetation planting/seeding, in consultation with an experienced aquatic biologist), including during the phased development/closure of the quarry areas, where possible.
- In consultation with an experienced avian biologist, Hammond River Holdings will consider erecting nest boxes for species of waterfowl (e.g., wood duck) that may currently use the site (i.e., in pre-construction conditions) or could be attracted to the area post construction. These species will be confirmed during the spring bird surveys planned for spring and early summer (2019).

Key WESP-AC Wetland Function #13 (Songbird, Raptor and Mammal Habitat)

To mitigate the loss or alteration of the songbird, raptor and mammal habitat wetland function, the following mitigation measures will be considered for implementation (as appropriate) as part of the Project:

- Refer to mitigation and closure measures for aquatic invertebrate, fish, turtle and amphibian habitat above.
- Efforts will be made to maintain as much mature vegetation (i.e., habitat for mammals and birds) on-site as possible; in particular, existing treed buffers surrounding wetlands located on the southeastern and southwestern portions of the site will be maintained to the extent possible.
- In consultation with an experienced avian biologist, Hammond River Holdings will consider erecting nest boxes for species of song birds (e.g., swallow nest boxes) that may currently use the site (i.e., in pre-construction conditions) or could be attracted to the area post-construction. These species will be confirmed during the spring bird surveys planned for spring and early summer (2019).

Key WESP-AC Wetland Function #14 (Native Plant Habitat and Pollinator Habitat)

To mitigate the loss or alteration of the native plant habitat and pollinator habitat wetland function, the following mitigation measure will be considered for implementation (as appropriate) as part of the Project:

- Plantings/seeding of native flowering herbaceous vegetation will be incorporated into the re-vegetation plans for the Project where possible.

Key WESP-AC Wetland Function #15 (Public Use and Recognition)

To mitigate the loss or alteration of the public use and recognition wetland function, the following mitigation measure will be considered for implementation (as appropriate) as part of the Project:

- Site reclamation and closure will consider the desired future land uses of the site following completion of operations on-site. Opportunities for recreational use of the site for hunting, fishing, trapping, and gathering, as well as for other recreational uses that may be offered by the presence of a large water feature on-site following closure, will be explored and considered for implementation based on the agreed end land use goals identified in consultation with the local community and First Nations.

Potential Restoration of Some Wetland Functions Following Reclamation and Closure

Although a limiting factor for the siting of the open pit is the location of the gypsum resource, the Project has been designed to the extent possible to limit the footprint and to concentrate site facilities to the northern portion of the property as much as possible in order to reduce direct effects to unmapped wetlands that are interacting with Watercourse WC3. As discussed throughout the EIA registration document and TRC Response Round #2, the avoidance of Wetland WL3 and unmapped wetlands in the area of the open pit would render the Project unfeasible. As discussed throughout the sections above, a naturalization approach to the development of proposed site facilities (e.g., berms, retention ponds, and progressive reclamation of areas of the open pit) will be undertaken to facilitate the continuation of key natural wetland functions of the 10 unregulated wetlands, to the extent possible.

A reclamation and closure plan will be developed for the site and submitted as part of the application for a mining lease under the Mining Act. The reclamation plan will focus on the natural enhancement of the site to achieve a productive land use or return it to its original condition, to the extent possible. Furthermore, following Project closure, the

open pit will provide a surface water feature and aquatic habitat that may contribute/revive wetland functions lost as a result of the Project. Potential reclamation options could consider the conversion of the water retention ponds on-site and associated discharge to WC3 to include the re-establishment of wetland habitat on-site, including potentially the planting of cattails or other hydrophilic vegetation, or the development of a facultative engineered wetland. The progressive reclamation and the naturalization approach discussed above will be applied throughout the phased development/closure of the open pit to allow for natural processes (including wetland functions) to be kick-started as soon as feasible.

We trust this meets your present requirements. Should you have any questions regarding the above response/mitigation plan, please do not hesitate to contact the undersigned, at your convenience.

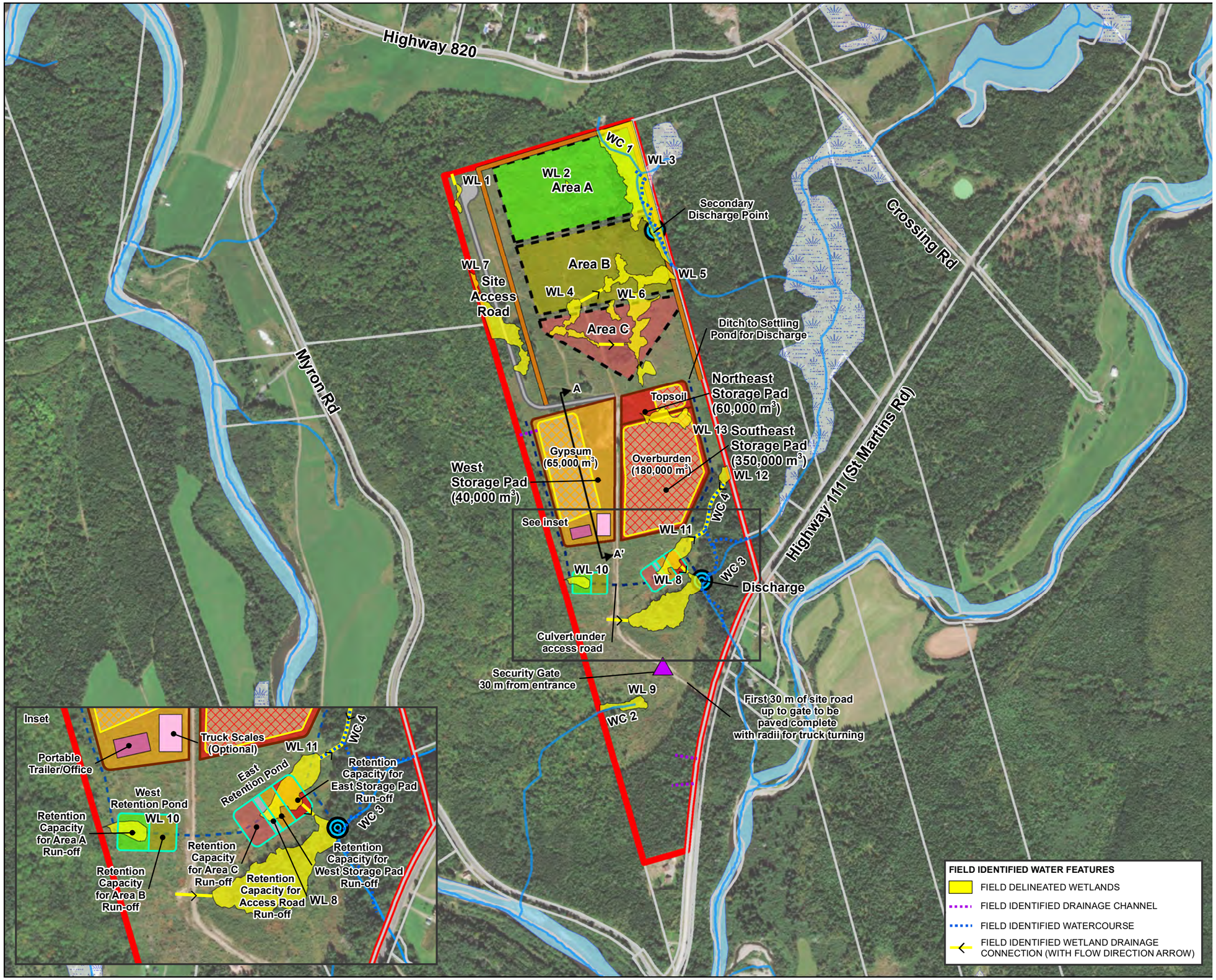
Sincerely,

DILLON CONSULTING LIMITED

Denis L. Marquis, M.Sc.E., P.Eng.
Associate

DLM:acs:bno

Enclosure



HAMMOND RIVER HOLDINGS LIMITED
PROPOSED UPHAM EAST GYPSUM QUARRY

CONCEPTUAL SITE LAYOUT PLAN
FIGURE 2.3.1

- PROPERTY BOUNDARY
- PROJECT DEVELOPMENT AREA
- WATERBODY
- WATERCOURSE
- REGULATED WETLAND

PROPOSED SITE FEATURES

- DITCH
- TRUCK SCALE (OPTIONAL)
- SITE AREAS
- DISCHARGE POINT
- SECURITY GATE
- PORTABLE TRAILER/OFFICE
- ACCESS ROAD
- STOCKPILE
- STORAGE PAD
- RETENTION POND
- CROSS SECTION
- QUARRY BERM CONSTRUCTED FROM TOPSOIL AND OVERBURDEN (OFFSET MINIMUM 7m FROM PROPERTY BOUNDARY)
- HATCHING INDICATES MATERIAL STOCKPILE AREA ON TOP OF STORAGE PAD

0 50 100 200 m

SCALE 1:8,500

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING LIMITED, CANVEC
SERVICE LAYER CREDITS: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISS TOPO, OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

MAP CREATED BY: BQS
MAP REVISED BY: JNH
MAP CHECKED BY: AS
MAP PROJECTION: NAD_1983_CSRS_New_Brunswick_Stereographic

FILE LOCATION: \\DILLON.CA\DILLON_DFS\FREDERICTON\FREDERICTON CAD\CAD\GIS\188346 UPHAM GYPSUM QUARRY\MXD

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