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RE: NWB 2BE-JAC – Twin Mining Corp. – Jackson Inlet Project

On behalf of Environment Canada (EC), I have reviewed the information submitted with the above-mentioned application. The following specialist advice has been provided pursuant to Environment Canada's mandated responsibilities for the enforcement of the *Canadian Environmental Protection Act*, Section 36(3) of the *Fisheries Act*, the *Migratory Birds Convention Act,* and the *Species at Risk Act*.

Twin Mining Corp. is proposing to renew their current water license to continue a mineral exploration program on the Brodeur Peninsula, in the area of Jackson Inlet. The proposed program would include reconnaissance mapping, drilling, trenching and mini-bulk sampling, soil sampling, and geological and geophysical surveys. The work will be supported from the existing 20-person camp located on the shore of Jackson River.

This project is occurring in a known Ivory Gull nesting area. Ivory Gulls were listed as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in April 2006 and are currently listed on Schedule 1 of the *Species at Risk Act* (SARA). Ivory Gull colonies may be susceptible to disturbance during the breeding season, and aircraft or human interferences could seriously jeopardize the breeding success of Ivory Gulls. The environmental assessment screening of this project completed by the Nunavut Impact Review Board (NIRB) included a number of terms and conditions which, if implemented, should help mitigate potential impacts of this project on Ivory Gulls. Environment Canada encourages the Nunavut Water Board to incorporate any relevant terms and conditions from the NIRB screening decision into the water license.

In order to facilitate our review of this application, EC requires the following information from the proponent:

- The coordinates of the proposed fly camp, stated to be located within 5 km of the main drill target. These coordinates should be sent as soon as possible in order to determine the fly camps location in relation of Ivory Gull nesting areas.
- Once available, the location of all drill sites, trenching and bulk sampling locations.

Environment Canada recommends that the following conditions be applied throughout all stages of the project:

- The proponent shall not deposit, nor permit the deposit of any fuel, chemicals, wastes or sediment into any water body. According to the Fisheries Act, Section 36(3), the deposition of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water, is prohibited.

- Given the period of occupation, EC does not anticipate that any ice-based drilling will occur. If the proponent decides to undertake ice-based drilling, EC should be contacted as further review may be required.
- Land based drilling should not occur within 30 m of the high water mark of any water body.
- The proponent shall take all appropriate measures to ensure that sedimentation does not occur during trenching activities. Measures should also be taken to help prevent erosion of exposed soils.
- Trenching activities should not occur below the high water mark of any waterbody. Any trenching/bulk sampling locations should be selected such that impacts to surrounding waterbodies are avoided.
- The *Canadian Environmental Protection Act* lists CaCl as a toxic substance. The proponent shall therefore ensure that if CaCl is used as a drill additive, all sumps containing CaCl are properly constructed and located in such a manner as to ensure that the contents will not enter any water body.
- Any sumps created for the disposal of camp sewage, grey water, or drill cuttings shall be located above the high water mark of any water body and in such a manner as to prevent the contents from entering any water body frequented by fish. Further, all sumps shall be backfilled upon completion of the field season and contoured to match the surrounding landscape.
- If an artesian flow is encountered, the drill hole shall be immediately plugged and permanently sealed.
- All fuel caches shall be located above the high water mark of any water body. Further, EC recommends the use of secondary containment, such as self-supporting insta-berms, when storing barreled fuel on location, rather than relying on natural depressions.
- **All spills** shall be documented and reported to the 24 hour Spill Line at (867) 920-8130.
- Environment Canada recognizes that timely disposal of camp waste - specifically food waste - is of critical importance to minimize safety risks associated with wildlife attraction. Timely disposal is usually achieved through burning. However, burning of waste products releases numerous contaminants to the air, many of them persistent, bioaccummulative and toxic (e.g. polycyclic aromatic hydrocarbons - PAH's - heavy metals, chlorinated organics – dioxins and furans). These contaminants can result in serious impacts to human and wildlife health through direct inhalation and they can also be deposited to land and water, where they bioaccumulate through food chains affecting wildlife and country foods. Therefore, burning should only be considered after all other alternatives for waste disposal have been explored.

  A variety of incineration devices are available and selection of the most appropriate will depend on considerations of technical and economical feasibility for each situation. For large, permanent camps and/or operational facilities (e.g. diamond mines), installation of an incineration device capable of meeting the emission limits established under the Canada-wide Standards (CWS) for Dioxins and Furans and the CWS for Mercury Emissions is required (both the Government of Canada and the Government of the Nunavut are signatories to these Standards and are required to implement them according to their respective jurisdictional responsibility). For small, temporary camps the use of a modified burn barrel may be acceptable. The proponent should review the incineration options available and provide justification for the selected device to the regulatory authority.

  If burning is the only alternative available, the proponent should ensure that the waste is burned in a device that promotes efficient combustion and reduction of emissions, and that the amount of waste burned is reduced as much as possible. The use of appropriate waste incineration technology should be combined with a comprehensive waste management strategy (especially waste segregation) that is designed to reduce and control the volumes of wastes produced, transported, and disposed of.

  The Waste Management Plan Waste should consider and include:
  - Purchasing policies that focus on reduced packaging,

- On-site diversion and segregation programs (i.e. the separation of non-food waste items suitable for storage and subsequent transport and disposal or recycling).
- If incineration is required, ensure diligent operation and maintenance of the incineration device and ensure appropriate training is provided to the personnel operating and maintaining the incinerator.

The objective should be to ensure that only food waste and food-contaminated waste is burned (the use of paper, cardboard and clean wood as supplementary fuel is acceptable).

Used absorbent materials, oily or greasy rags, and equipment servicing wastes (such as used engine oil, antifreeze, hydraulic oil, lead acid batteries, brake fluid and other lubricants) should be safely stored and transported in sealed containers (odour free to prevent animal attraction) and safely transported to a facility that is authorized for the treatment and disposal of industrial hazardous wastes.

The Canadian Wildlife Service (CWS) of Environment Canada has reviewed the above-mentioned submission and makes the following comments and recommendations pursuant to the *Migratory Birds Convention Act* (the *Act*) and *Migratory Birds Regulations* (the *Regulations)*, and the *Species at Risk Act* (SARA).

The following comments are pursuant to the Species at Risk Act (SARA), which came into full effect on June 1, 2004. Section 79 (2) of SARA, states that during an assessment of effects of a project, the adverse effects of the project on listed wildlife species and its critical habitat must be identified, that measures are taken to avoid or lessen those effects, and that the effects need to be monitored. This section applies to all species listed on Schedule 1 of SARA.

Species at Risk that may be encountered	Category of Concern	Schedule of SARA	Government Organization with Expertise on Species
Ivory Gulls	Endangered[1]	Schedule 1	Environment Canada

[1] Designated as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in April 2006 and it is expected that the category of concern in SARA will also be changed from Special Concern to Endangered.

Ivory Gulls breed on the Brodeur Peninsula (also see attached fact sheet for more information).

Known Breeding Colonies on the Brodeur Peninsula

Latitude	Longitude
73º 32' N	87º 40' W
73º 32' N	87º 52' W
73º 39' N	87º 29' W
73º 39' N	87º 33' W
73º 37' N	87º 39' W
73º 38' N	87º 37' W
73º 34' N	87º 52' W
73º 29' N	87º 47' W
73º 28' N	87º 54' W
73º 18' N	88º 38' W
73º 18' N	88º 34' W
73º 16' N	88º 39' W
73º 31' N	86º 54' W
73º 39' N	87º 18' W
73º 19' N	87º 54' W
73º 25' N	86º 21' W
73º 25' N	87º 33' W

Ivory Gull colonies may be susceptible to disturbance during the breeding season. Aircraft or human interferences could seriously jeopardize the breeding success of Ivory Gulls.
In addition to being a listed species under SARA, Ivory Gulls also are protected by the *Migratory Birds Convention Act* and *Regulations*. Section 6 (a) of the Migratory Birds Regulations states that no one shall disturb or destroy the nests or eggs of migratory birds.

Environment Canada recommends:

- The primary mitigation measure should be avoidance. The proponent should avoid contact with or disturbance to each species.
- No project activities should be done within 2 km of any known colonies of Ivory Gulls (see list above) and any other observed groups (colonies) of Ivory Gulls.
- Any aircraft used in conducting project activities should maintain a horizontal distance of 2 km and a vertical distance of 610 m from any known colonies of Ivory Gulls (see list above) and any other observed groups (colonies) of Ivory Gulls.
- The proponent should record the locations and frequency of any observations of Ivory Gulls and note any actions taken to avoid contact or disturbance to the species. Any observations should be forwarded to Mark Mallory (Seabird Biologist, Canadian Wildlife Service, Environment Canada, Box 1714, Qimugjuk Bldg. 969, Iqaluit, NU, X0A 0H0, Ph: (867) 975.4637 or mark.mallory@ec.gc.ca)
- Canadian Wildlife Service (in co-operation with other mineral explorations working in the area) is undertaking monitoring research on Ivory Gulls on the Brodeur Peninsula to better understand the effects of mineral exploration and helicopter disturbance on the nesting success of Ivory Gulls. Involvement in this monitoring program by Twin Mining Corporation would help meet the requirements of Section 79 (2) under SARA for monitoring. More information on this program can be obtained from Mark Mallory (contact information above) or Grant Gilchrist (Research Scientist, Canadian Wildlife Service, Environment Canada, National Wildlife Research Centre,1125 Colonel By Drive, Raven Road, Carleton University. Ottawa, Ontario. K1A 0H3, Ph: (613) 998-7364 or grant.gilchrist@ec.gc.ca)
- Question 9 of the Supplemental Questionnaire notes that “because of the scarcity of vegetation, wildlife is restricted to a small population of foxes, lemmings, ravens and seagulls.” It is likely that the seagulls observed in the project area are Ivory Gulls. The proponent is reminded that as per the NIRB screening decision, the locations and frequency of any observations of Ivory Gulls, as well as any actions taken to avoid contact or disturbance to the species are to be recorded and submitted to Mark Mallory with the Canadian Wildlife Service (see contact information above).
- Question 14 of the Supplemental Questionnaire states that the project will not have any impacts on local fish and wildlife habitats. Environment Canada disagrees with this statement, as aircraft or human interferences could seriously jeopardize the breeding success of Ivory Gulls. The Permittee should consult with EC to help identify other appropriate mitigation measures to minimize effects to Ivory Gulls from the project and for development of appropriate monitoring for Ivory Gulls. Information regarding an on-going monitoring program between the Canadian Wildlife Service and industry is detailed above.

If there are any changes in the proposed project, EC should be notified, as further review may be necessary. Please do not hesitate to contact me with any questions or comments with regards to the foregoing at (867) 975-4639 or by email at colette.spagnuolo@ec.gc.ca.

Yours truly,

Original signed by

Colette Spagnuolo
Environmental Assessment / Contaminated Sites Specialist

cc: (Stephen Harbicht, Head, Assessment and Monitoring, Environment Canada, Yellowknife)
(Myra Robertson, EA Coordinator, Canadian Wildlife Service, Environment Canada, Yellowknife)

Fact Sheet

Ivory Gulls (*Pagophila eburnea*)

Figure 1. Ivory gulls at an island breeding colony. Ivory gulls are identified by their pure white plumage and black legs (other gulls have gray wings and yellow or orange legs). Note birds sitting on nests constructed of moss.

Natural History:

The ivory gull is a small, white seabird which spends most of its life near ice (Fig. 1). It breeds on snow and windswept plateaus, ice-choked islands or nunataks surrounded by glaciers, and winters in pack ice. It feeds along floe edges and polynyas, and is often observed standing on elevated icebergs.

Ivory gulls feed on zooplankton and fish, and are well-known for their habit of scavenging from polar bear or Inuit kills of marine mammals.

Gulls arrive in the Arctic in late April, and begin to move to open water and south in September, although some may be seen in the Arctic much later. Birds arrive at breeding colonies in June, and remain there into August. Nests are constructed of available vegetation, and 1-3 eggs are laid.

Estimated Population Size:

1980s 1800 birds counted; 2400 birds suspected
2002-2005 maximum 400 birds counted (approx. 80% decline)

The species is currently listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). However, surveys at breeding colonies, at sea, and on the wintering grounds, as well as Inuit traditional knowledge, all suggest that populations are declining.

Breeding Locations:

Ivory Gulls breed on Ellesmere, Devon, Seymour, Cornwallis and north Baffin islands (black dots on Fig. 2). Colonies are generally small, about 20 pairs of birds, but may get up to 200 pairs in some locations.

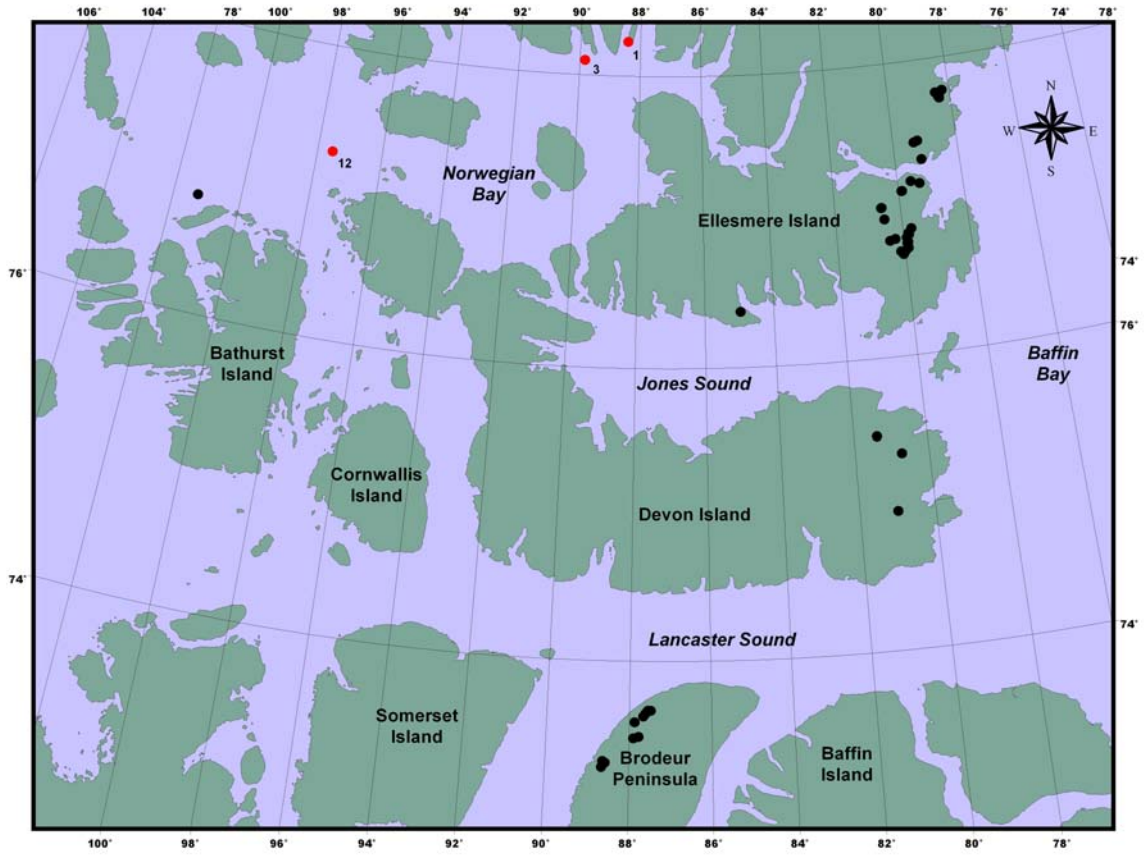

Figure 2. Breeding locations of ivory gulls in Nunavut, denoted by black dots (red dots are recent observations at sea).

Since the 1980s, many former colonies have been abandoned (Fig. 3), and recent colonies generally support fewer birds than colonies from 20+ years ago.

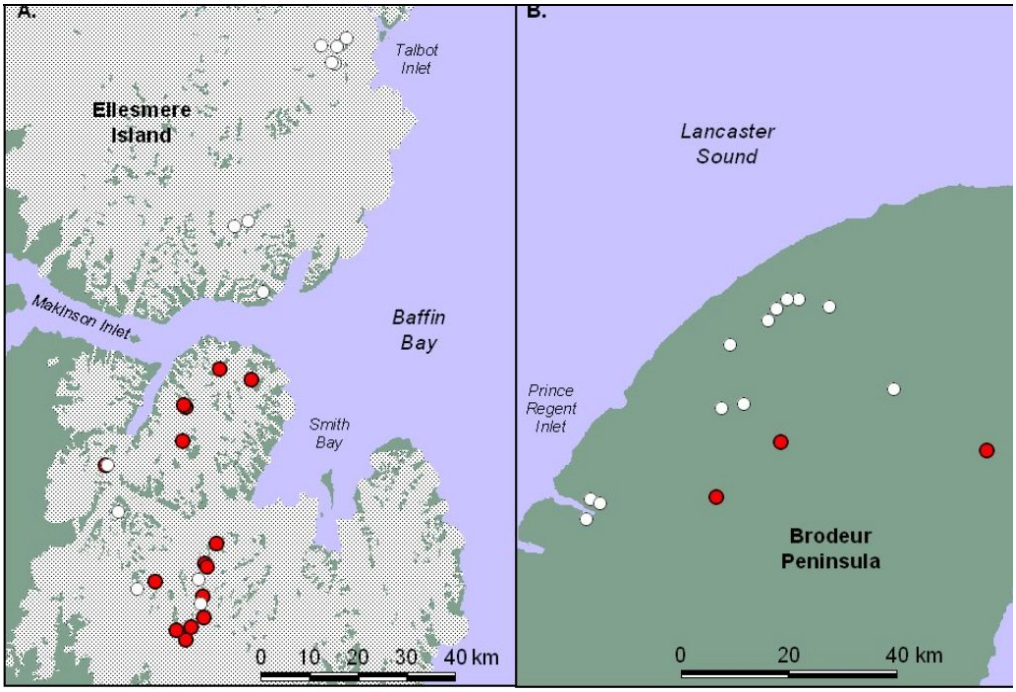

Figure 3. Former (white dots) and recent (red dots) colonies of ivory gulls on eastern Ellesmere Island (left panel) and the Brodeur Peninsula, Baffin Island (right panel).

On the Brodeur Peninsula, ivory gulls nest on flat ground (Fig. 4) but will generally jump into the air and circle their colony at the approach of an aircraft or predator. There are few if any other birds in this area, so white birds observed are undoubtedly ivory gulls.

Figure 4. Ivory gulls nesting on flat ground.

Wintering Locations:

Canadian ivory gulls are thought to spend the winter in the pack ice in Davis Strait, off of Labrador and Newfoundland. Some birds are observed near shore occasionally.

Threats:

Like many breeding seabirds, ivory gulls are susceptible to disturbance when at the breeding colony. As migratory birds, they are protected during the breeding season by the *Migratory Birds Convention Act* and *Migratory Birds Regulations*, which prohibit disturbance or destruction of nests and eggs. Some researchers have suggested that they are particularly vulnerable to disturbance from aircraft, although other scientists have suggested that they can tolerate minor or very infrequent disturbance.

At sea, these gulls are susceptible to pollution and disturbance at feeding areas, and they are also harvested in Greenland.

Future Considerations:

Ivory gull population size and trends are perilously low, and it is very likely that this species will be uplisted to *Threatened* or *Endangered* pursuant to the *Species At Risk Act* in the near future. That action will be associated with some restrictions on activities that can have a negative effect on the birds near ivory gull colonies. For that reason, it is essential that colonies be identified and avoided for the protection of the birds. Industrial activities near nesting areas should not proceed.

If a colony is spotted, we strongly recommend that the aircraft maintain a vertical distance of 610 m and a horizontal distance of 2 km from the location.

If ivory gulls are observed, please record the location and contact us:

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