Marine and Diadromous Fish

Species Listed on Schedule 1 (the official list of wildlife species at risk in Canada).

Species: Atlantic Salmon (*Salmo salar*) Inner Bay of Fundy Population

SARA Status and Listing Date: Endangered, 2002

Species Information:

The inner Bay of Fundy (iBoF) salmon is a genetically distinct, critically endangered population. Approximately 250 wild individuals are thought to remain. It is believed that these salmon migrate out of the Bay of Fundy along the New Brunswick coast into the Gulf of Maine, and return to the inner bay along the Nova Scotia coast. Inner Bay of Fundy salmon may be found near the project site from May through October. An Allowable Harm Assessment for this population has concluded that any human-induced mortality could jeopardize its survival or recovery. Low marine survival rates appear to be the primary limiting factor for the population, but the cause is not known.

Summary of Potential Effects and Mitigation Measures:

IBoF salmon could be affected by blasting, sedimentation, contamination and/or habitat loss associated with the project. For blasting, a set back distance of approximately 34m from the blast sites to possible fish habitat is expected to prevent a harmful overpressure from occurring in marine waters as a result of the blasts associated with this quarry. Because of the endangered status of iBoF salmon, DFO has recommended precautionary measures to prevent harm to this population. Specifically, DFO has recommended that the proponent increase the setback distance from the blast holes by three times when iBoF salmon may be present. This mitigation measures is expected to effectively prevent harm to the species.

The amount of marine habitat that is expected to be destroyed by this project is small in relation to available marine habitat in the Bay of Fundy and is not considered critical salmon habitat. The proponent will be required to develop and implement an approved fish habitat compensation plan. This is expected to effectively mitigate any negative effects that might occur as a result of habitat loss.

Given the release of contaminants and sediments in the amounts specified by the proponent in the EIS, adverse effects to inner Bay of Fundy salmon are unlikely. If the project proceeds, monitoring of contaminants and sediments should be implemented to ensure that releases do not exceed the amount which may have potential effects.

SARA Permit to be Issued: Not expected. DFO Science has determined that there is no allowable harm for this population, therefore it is not anticipated that permits will be issued to cause incidental harm to iBoF salmon. The proponent must prevent causing harm to this species through project design and effective mitigation measures.[1]

Species: Atlantic whitefish (*Coregonus hunstmani*)

SARA Status and Listing Date: Endangered, 2002

Species Information:

The Atlantic whitefish is an anadromous species, occupying nearshore waters while in the marine environment. The current distribution of the Atlantic whitefish is limited to a few watersheds in Mahone Bay (predominantly three land-locked lakes in the Petite Riviere system). The historical distribution included the Tusket River and adjacent marine embayments. It is unlikely that this species will be found in the vicinity of the project in the near future. If the Atlantic whitefish were to recolonize or be reintroduced into the Tusket, individuals could conceivably be found in or around the project area, but there is no evidence that whitefish ever occupied the immediate vicinity of the quarry.

Summary of Potential Effects and Mitigation Measures:

If present in the area, Atlantic whitefish could be affected by blasting, sedimentation or contamination. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting and restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. Given that it is unlikely whitefish will occur in the vicinity of the quarry during its lifespan, and taking into account the proposed mitigation, adverse effects to this species are not expected.

SARA Permit to be Issued: Not expected, as the distribution of the species does not currently to overlap with project activities.[1]

Species: Atlantic wolffish (*Anarhichas lupus*) Atlantic Pop.

SARA Status and Listing Date: Special Concern, 2002

Species Information:

Atlantic wolffish is a marine species found principally in the deep waters of the continental shelf on rocky or hard clay bottoms, and only occasionally on sand or mud. It is found anywhere from very shallow water to 500 m deep and is said to prefer depths between 100 and 150 m. There have been numerous landings recorded in the Bay of Fundy adjacent to the quarry, but the primary aggregations of this species are off Newfoundland. The population numbers tens of millions of individuals, and despite a declining population off Newfoundland, appears to be stable off Nova Scotia.

Summary of Potential Effects and Mitigation Measures:

Individuals in the vicinity of the quarry could be affected by blasting, sedimentation, or contamination. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting and restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. Furthermore, the pathways of effects associated with this project are not

identified as limiting factors for this species, and the number of individuals likely to be found in the vicinity of the project is small in comparison to the size of the population. Given the above, adverse effects to this species are not expected.

SARA Permit to be Issued: No. SARA permits are not issued for species of special concern as the prohibitions do not apply to such species.[1]

COSEWIC Designated Fish Species Not Listed on Schedule 1

Species: Porbeagle Shark (*Lamna nasus*)

COSEWIC Status and Date: Endangered, 2004

SARA Status: GiC decision was not to list under SARA, 2006

Species Information:

The porbeagle is a pelagic, epipelagic, or littoral shark that is usually more common on continental shelves. The Bay of Fundy is within its Canadian range. According to COSEWIC, evidence indicates that the northwest Atlantic porbeagle population has declined substantially over the past half century. The primary human-induced limiting factor for this species identified by COSEWIC is fisheries removals.

Summary of Potential Effects and Mitigation Measures:

The porbeagle shark could be affected by blasting, sedimentation, or contamination associated with this project. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting and restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. It should be noted that elasmobranchs are probably less likely to be effected by blasting than finfish because they lack a swim bladder. Furthermore, the pathways of effects associated with this project are not identified as limiting factors for this species. Given the above, and that the number of individuals found adjacent to the quarry would likely be very small compared to the total population size, adverse effects to this species are not expected.

Species Name: White Shark (*Carcharodon carcharias*) Atlantic Pop.

COSEWIC Status and Date: Endangered, 2006

SARA Status: Under consideration for addition to Schedule 1.

Species Information:

The white shark is widely distributed in sub-polar to tropical seas of both hemispheres, but is not frequently observed and captured in inshore temperate water over the continental shelves of the western North Atlantic. Very few records from the Bay of Fundy exist and white sharks are thought to visit the area only rarely. There have been

only 34 recorded captures in Canadian waters since 1874. Little is known about the population size or trends, although it is believed that the population is declining.

Summary of Potential Effects and Mitigation Measures:

If in the vicinity of the project, white sharks could be affected by blasting, sedimentation, or contamination associated with the quarry. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting, restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. Furthermore, the likelihood of a white shark occurring in the immediate area is low, elasmobranchs are probably less likely to be effected by blasting than finfish because they lack a swim bladder, and the pathways of effects associated with this project are not identified as limiting factors for this species. Given the above, adverse effects to this species are not expected.

Species: Shortfin Mako (*Isurus oxyrinchus*)

COSEWIC Status and Date: Threatened, 2006

SARA Status: Under consideration for addition to Schedule 1.

Species Information:

The Shortfin mako is a large, pelagic shark inhabiting temperate and tropical waters. They occur from the surface to 500 m depths and typically well offshore, but shortfin makos have occasionally been observed in littoral zones and could occur in waters around the quarry site. Some models indicate a decline in this population in recent years, while others suggest that the population has been fairly stable over the last two decades.

Summary of Potential Effects and Mitigation Measures:

If in the vicinity of the project, shortfin mako sharks could be affected by blasting, sedimentation, or contamination associated with the quarry. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting, restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. Furthermore, shortfin mako are not expected to regularly occur in the immediate area, elasmobranchs are probably less likely to be effected by blasting than finfish because they lack a swim bladder, and the pathways of effects associated with this project are not identified as limiting factors for this species. Given the above, adverse effects to this species are not expected.

Species Name: Blue Shark (*Prionace glauca*) Atlantic Pop.

COSEWIC Status and Date: Special Concern, 2006

SARA Status: Under consideration for addition to Schedule 1.

Species Information:

The blue shark is pelagic and is most commonly encountered offshore between the surface and 350 m. Blue sharks are occasionally encountered in the Bay of Fundy and their occurrence is possible in waters off the Whites Point quarry site. Some models indicate a decline in this population, but it is still one of the most abundant sharks in Canadian waters.

Summary of Potential Effects and Mitigation Measures:

If in the vicinity of the project, blue sharks could be affected by blasting, sedimentation, or contamination associated with the quarry. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting, restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. Blue sharks are not expected to regularly occur in the immediate area, and as elasmobranches, are probably less likely to be affected by blasting than finfish because they lack a swim bladder. Furthermore, the pathways of effects associated with this project are not identified as limiting factors for this species. Given the proposed mitigation measures, and that the number of individuals found adjacent to the quarry would likely be very small compared to the total population size, adverse effects to this species are not expected.

Species: Winter skate (*Leucoraja ocelatta*) Georges Bank-Western Shelf-Bay of Fundy

COSEWIC Status and Date: Special Concern, 2005

SARA Status: Under consideration for addition to Schedule 1.

Species information:

The winter skate is a bottom-dwelling species usually found on sand and gravel at depths less than 111 m. Concentrations of winter skate exist in the upper Bay of Fundy. It is therefore likely that winter skate could inhabit the Bay of Fundy waters adjacent to the Whites Point quarry site. This population appears to be relatively stable.

Summary of Potential Effects and Mitigation Measures:

Winter skate could potentially be affected by blasting, sedimentation, or contamination associated with the quarry. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting and restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. Furthermore, elasmobranchs are probably less likely to be affected by blasting than finfish because they lack a swim bladder and the pathways of effects associated with this project are not identified as limiting factors for this species. Additionally, the number of winter skate in the vicinity of the project is likely to be very small in relation to the total population. If recommended mitigation is fully implemented, adverse effects to this species are not expected.

Species: Striped Bass (*Morone saxatilis)* Bay of Fundy Pop.

COSEWIC Status: Threatened, 2004

SARA Status: Under consideration for addition to Schedule 1

Species information:

The striped bass is an andromous species that historically occupied three rivers in the Bay of Fundy: the Annapolis, St. John and Shubenacadie. Of these, only the Shubenacadie currently appears to support a spawning population. The Shubenacadie population appears to be stable. The extent of striped bass distribution is not thought to extend beyond a line from the Digby Gut to the mouth of the Saint John River. Therefore, occurrence in the immediate vicinity of the project is not likely.

Summary of Potential Effects and Mitigation Measures:

This species could be affected by blasting, sedimentation, contamination and/or habitat loss. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting and restricts releases of sediment and contaminants to the levels outlined in the EIS, the above noted effects are expected to be effectively mitigated. Given that the project is not within the known distribution of the species, and taking into account the proposed mitigation measures, adverse effects to striped bass are not expected.

Species: Atlantic Cod (*Gadus morhua*) Maritimes Population

COSEWIC Status: Special Concern, 2003

SARA Status: GiC decision was not to list under SARA, 2006

Species information:

Atlantic cod is a demersal fin fish occupying Canadian waters from the Hague Line to Baffin Island, including the Bay of Fundy. Juveniles tend to occupy heterogeneous nearshore habitats with three dimensional structure (e.g., eel grass, rocks, plants), while adults have less specific habitat requirements. According to COSEWIC, juvenile habitat is most likely to be critical and limiting for this species. Although the Maritimes population overall has declined by 14% in recent years, the Bay of Fundy is not at unprecedented levels and has shown improved recruitment since 1998.

Summary of Potential Effects and Mitigation Measures:

Atlantic cod could be affected by blasting, sedimentation, contamination and/or habitat loss associated with the project. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting, restricts releases of sediment and contaminants to the levels outlined in the EIS, and implements an approved habitat compensation plan, the above effects are expected to be effectively mitigated.

Species: American Eel (*Anguilla rostrata*)

COSEWIC Status and Date: Special Concern, 2006

SARA Status: Under consideration for addition to Schedule 1.

Species information:

The American eel is a catadromous panmictic species that is widely distributed in fresh waters, estuaries and coastal areas of the western north Atlantic, from near the equator to Greenland. Its Canadian range encompasses all accessible fresh water, estuaries and coastal marine waters connected to the Atlantic Ocean of Canada. American eels could be found traveling through coastal waters adjacent to the quarry. The occurrence of American eel in the streams immediately adjacent to the Whites Point quarry site is unlikely due to their small size and poor accessibility from the Bay of Fundy. Abundance of American eels has declined precipitously in the Great Lakes and Western St. Lawrence, probably due to in large part to dams, but there has not been a similar decline in the Maritimes Region.

Summary of Potential effects and Mitigation Measures:

American eels could be affected by blasting, sedimentation, contamination and/or habitat loss associated with the project. Marine habitat is not thought to be limiting for this species, and the amount of habitat affected by this project is extremely small in comparison to available marine habitat for eels. Effects of blasting, sedimentation and contamination on American eel are likely to be similar to those on other fish species occurring in the area. If the proponent follows DFO's recommendations regarding set backs and procedures for blasting, restricts releases of sediment and contaminants to the levels outlined in the EIS, and implements an approved habitat compensation plan, the above noted effects are expected to be effectively mitigated.

Marine Mammals and Turtles

Species Listed on Schedule 1 of SARA

Species: North Atlantic right whale (*Eubalaena glacialis*)

SARA Status and Date: Endangered, 2002

Species Information:

The North Atlantic right whale is a large baleen whale that occupies the Bay of Fundy from at least June to October, sometimes arriving earlier and/or remaining later. Grand Manan basin is considered an important aggregation area, and was recently identified by DFO Science as probable critical habitat for the species. Right whales are not commonly found in the immediate vicinity of the quarry. There are no recorded sightings in the 3 minute survey grid cells immediately adjacent to the site. Right whales are critically

endangered, with an estimated population of approximately 350 individuals. A recent assessment by DFO concluded that any human induced mortality to this species could jeopardize its survival or recovery.

Summary of Potential Effects and Mitigation Measures:

Vessel Strikes:

Right whales are known to be especially susceptible to vessel strikes. Collisions with vessels are one of the main sources of human-induced mortality for this species. Any increase in vessel traffic in the Bay of Fundy increases the risk of vessel strikes to right whales. Reducing vessel speed after leaving the shipping lanes should reduce the probability of mortality in the event of a vessel strike in the area between the quarry and the lanes, but will not necessarily reduce the likelihood of a vessel strike occurring. Regardless, a ship strike related to this project is more likely to occur before the vessel leaves the shipping lane, where whale densities are higher. The other mitigation measures proposed by the proponent (communicating with whale watch groups regarding presence of whales, patrolling the route to the quarry with a work boat, taking evasive action if whales are sighted) may reduce the likelihood of a vessel strike to some degree, but it is unclear by how much or how effectively these strategies can be implemented. Nonetheless, given the location of the quarry (outside the main aggregation area for right whales), the relatively small amount of vessel traffic expected, and taking into account the proposed mitigation measures, the potential for lethal vessel strikes associated with the quarry is considered low.

Shipping noise:

Increases in ambient noise associated with shipping may affect right whales' ability to use sound and/or respond to threats. However, the increase in shipping noise in right whale habitat associated with this project is expected to be minimal due to the relatively small increase in traffic and the location of the quarry. Nonetheless, monitoring of shipping noise is recommended if the project proceeds.

Blasting:

Based on the available modeling data, it is believed that physical harm to marine mammals could occur within 500 m of a blast. The proposed mitigation (monitoring a safety zone for marine mammals prior to blasting) is expected to substantially reduce the risk of a blast occurring while a whale is within a 500 m radius during good weather conditions. Given the location of the quarry and the frequency of blasting, physical harm to right whales is considered very unlikely if mitigation is applied rigorously. Although sound modeling beyond 500 m has not been provided, it is believed that behavioural effects to marine mammals could occur outside this zone. The ability of the proponent to monitor a safety zone larger than 500 m is uncertain, and therefore behavioural effects to right whales are considered possible. However, these effects would not necessarily be adverse. Harmful effects are considered unlikely, but the confidence associated with this conclusion is low. Monitoring a representative blast prior to the arrival of right whales would help to improve the confidence associated with these effects predictions.

SARA Permit to be Issued: Not expected. DFO Science has determined that there is no allowable harm for this species, therefore it is not anticipated that permits will be

issued to cause incidental harm to North Atlantic right whales. The proponent must prevent causing harm to this species through project design and effective mitigation measures.[1]

Species: Blue Whale (*Balaenoptera musculus*) Atlantic Pop.

SARA Status and Date: Endangered, 2002.

Species Information:

The blue whale is the largest extant marine mammal. They are rarely encountered in the Bay of Fundy, although they are known to visit the area occasionally in late May to mid June. It is believed that approximately 250 individuals remain in the Atlantic population. Given their critically endangered status, any human-induced mortality to this species could have population-level effects.

Summary of Potential Effects and Mitigation Measures:

Vessel Strikes:

Although blue whales are probably less susceptible to ship strikes than right whales, collisions with vessels are a known source of mortality for this species and are considered a "serious problem" by COSEWIC. The assessment of the effectiveness of mitigation measures discussed above in relation to right whales is also generally applicable to blue whales. The main difference in terms of the level of risk posed this species is that it occurs much less frequently in the Bay of Fundy. Taking this into account, along with the amount of vessel traffic expected at the marine terminal and the proposed mitigation, the likelihood of a vessel strike to a blue whale as a result of this project is low.

Blasting:

Physical injury to blue whales could possibly occur from blasting if an individual were to be located within 500 m of a blast. The discussion of mitigation measures above in relation to right whale is applicable. Given the infrequent occurrence of this species in the Bay of Fundy, and taking into account the proposed mitigation measures and the frequency of blast events, physical injury to blue whales from blasting is considered unlikely. The infrequent occurrence of the species in the project area also makes behavioural effects on blue whales unlikely. As with the other species mentioned in this section, initial blast monitoring would help to improve the confidence in effects predictions related to blasting.

SARA Permit to Be Issued: Unlikely. An allowable harm assessment has not been carried out for this species, but given the small population size the scope for allowable harm is likely to be very limited. The proponent must prevent causing harm to this species through project design and effective mitigation measures.[1]

Species: Fin Whale *(Balaenoptera physalus)* Atlantic Pop.

SARA Status and Date: Special Concern, 2006

Species Information:

Fin whales are large baleen whales that are commonly sighted in the Bay of Fundy from June to October, sometimes within the vicinity of the project area. Although the fin whale is a species of special concern, it is far more abundant than blue or right whales, with at least several thousand individuals occupying waters of Eastern Canada. The scope for harm to this species is therefore probably somewhat greater than for the other whales mentioned above.

Summary of Potential Effects and Mitigation Measures:

Vessel strikes:

Fin whales are struck by ships more frequently than other balaenopterids, primarily by vessels longer than 80 m travelling at speeds greater than 14 kts. The assessment of the risk posed by ship strikes and the effectiveness of mitigation presented above in relation to right whales is also generally applicable to this species, except that fin whales are more likely than right whales be encountered along the route between the shipping lane and the marine terminal. Nonetheless, given the level of ship traffic associated with the project and the proposed mitigation measures, vessel strikes to fin whales are unlikely.

Blasting:

Conclusions presented above in relation to right whale are also generally applicable to fin whale, except that fin whales are more likely to be encountered in the immediate vicinity of the quarry. Physical injury to fin whales could possibly occur from blasting if an individual were to be located within 500 m of a blast; however, given the proposed mitigation measures and the frequency of blast events, physical injury to fin whales from blasting is considered unlikely. Behavioural effects to fin whales may extend beyond 500 m from blast sites, and may not be effectively mitigated through visual observation of a 2500 m safety zone, but such effects would not necessarily be adverse. Harmful effects to fin whales are thought to be unlikely, but the confidence associated with this conclusion is low. Monitoring of an initial blast would help to improve confidence.

SARA Permit to be Issued: No. SARA permits are not issued for species of special concern as the prohibitions do not apply to such species. [1]

Species: Leatherback Turtle (*Dermochelys coriacea)*

SARA Status: Endangered, 2002

Species Information:

The leatherback turtle is a large (up to 2 m) scale-less sea turtle whose distribution extends from the southern tropics to the far north. Leatherbacks visit Canadian waters annually in substantial numbers. However, very few leatherbacks have been sighted in the Bay of Fundy. Of the handful of sightings that have occurred in the bay, several were in the general vicinity of Whites Cove. The leatherback population is in decline globally, primarily due to impacts on southern nesting beaches, entanglement in lines, and ingestion of garbage.

Summary of Potential Effects:

Vessel strikes are not an identified threat to leatherback turtles. Little is known about the auditory capacity of this species, and therefore the effect of noise on leatherbacks is unknown. DFO has recommended that the guidelines for marine mammals and blasting also be applied in the case of leatherback turtles. However, monitoring a safety zone visually or acoustically for sea turtles is much more difficult than for marine mammals, and therefore the effectiveness of this mitigation is likely to be limited. Nonetheless, given the infrequent occurrence of this species in the project area, the likelihood of harmful effects to this species from blasting is thought to be low.

SARA Permit to Be Issued: Unlikely. There is scope for allowable harm to this species, and therefore a permit could be issued to cause incidental harm to leatherback turtles under Section 73 of SARA if the other relevant preconditions outlined in the Act were met. However, SARA permits are typically only issued where there is a reasonable likelihood of interaction with a listed species. In this case, the likelihood of a harmful effect is considered low, therefore it is unlikely that a permit will be issued. [1]

COSEWIC Designated Marine Mammal Species Not Listed on Schedule 1

Species: Harbour Porpoise (*Phocoena phocoena)* North West Atlantic Pop.

COSEWIC Status: Special Concern, 2006

SARA Status: Under consideration for addition to Schedule 1.

Species Information:

The harbour porpoise is one of the smallest cetaceans found in Eastern Canada, and is widely distributed in Canadian waters from the Gulf of Maine to Baffin Island. It appears that a distinct sub-population exists in the Bay of Fundy - Gulf of Maine, numbering close to 100,000 individuals according to 1999 data. Harbour porpoises are most often found in inshore areas, including harbours and embayments, and commonly occur along Digby neck. It is the cetacean species most likely to be found in the immediate vicinity of the quarry.

Summary of Potential Effects and Mitigation Measures:

Acoustic harassment is identified by COSEWIC as a potential threat to harbour porpoises. There is particular concern regarding potential habitat exclusion as a result of acoustic harassment in the Bay of Fundy. However, this concern relates primarily to acoustic harassment devices associated with aquaculture sites, which typically emit continuous or frequently recurring signals. Blasting and shipping associated with the quarry, by comparison, will occur relatively infrequently and are therefore not expected to exclude harbour porpoises from habitat. Physical effects to harbour porpoises could occur if individuals are located within 500 m of a blast, which is possible given the frequency with which this species occurs in the project area. The proposed mitigation measures, if implemented rigorously, should substantially reduce the risk of blasting occurring while harbour porpoises are within 500 m of a blast site. However, because of their small size, harbour porpoises may be harder to detect than other cetaceans. Behavioural effects to harbour porpoises could occur beyond 500 m. No mitigation is proposed for this species outside the 500 m safety zone. Behavioural effects would not necessarily be adverse, and given the abundance of harbour porpoises in the Bay of Fundy - Gulf of Maine, it is very unlikely that they would result in population-level effects. Vessel strikes are not a known source of mortality for this species.

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[1] SARA permits may be issued in the future if the status of a species changes, new species are added to Schedule 1, critical habitat is identified for listed species, or other changes in conditions warrant the issuance of a permit. Permits will only be issued if the pre-conditions outlined in the *Species at Risk Act* are met.