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## Chidliak 2014 Baseline Environmental Program Summary

The Chidliak Project, owned and operated by Peregrine Diamonds Ltd. (Peregrine) is situated on Hall Peninsula, southeast Baffin Island, Nunavut approximately 120 kilometres (km) northeast of Iqaluit. Peregrine has completed environmental studies at the project site each year since 2009. Tetra Tech EBA Inc. (Tetra Tech EBA) was retained by Peregrine to conduct the 2014 studies to gain further understanding of the environmental baseline conditions to plan exploration activities so that potential impacts to the surrounding environment may be avoided or minimized, as much as possible.

Peregrine concentrates their exploration activities to a Priority Area; an area inland approximately 546 square kilometres (km<sup>2</sup>). Baseline environmental surveys were conducted from August 7 to 11, 2014 both within the Priority Area as well across a larger 3,083 km<sup>2</sup> study area. Mr. Amie Nashalik (from Pangnirtung) and Mr. David Willis, Peregrine's Lands Administrator assisted during the baseline studies. During this field event, the following six environmental studies were conducted:

### Surface Water Quality Sampling

Since 2009, water quality samples were collected during 14 separate field events. The 2014 surface water quality sampling program continued at the same locations as previous years as well as 15 new sampling stations. The same laboratory methods were maintained. A total of 28 water quality stations were sampled for routine water quality parameters, nutrients, total metals, total organic carbon, and oil and grease. The laboratory results indicated that all sampled parameters were within the Canadian Council of Ministers of the Environment for the Protection of Freshwater Aquatic Life (CCME FAL) guidelines at all sampling stations, except for pH and total Aluminum. These results are consistent with the water quality results from previous years, and are considered to be representative of natural background conditions.

### Camp Potable Water Quality Sampling

Potable water quality samples were collected from five locations within Discovery Camp to ensure the drinking water met the Canadian Drinking Water Quality guidelines for total coliforms, faecal coliforms, and *Escherichia coli* (*E. coli*). In 2014, the first time in five consecutive annual sampling events, potable water from one of two water tanks in Discovery Camp did not meet applicable guidelines. Prior to this sampling event, the disinfecting systems used in camp (UV filtration (Trojan UV Max) and bleach systems)) were proven effective. In 2014, the water tank that didn't meet guidelines relied on the bleaching system for disinfection, and therefore, misapplication of the bleaching procedure was likely the cause. Once receiving these results, Peregrine drained and cleaned the affected water tank prior to refilling, and reminded camp maintenance staff on the importance of following standard disinfection procedures.

### Aerial Caribou Survey

Since 2009, 12 aerial caribou surveys have been conducted within the Chidliak Project area. In 2014, an aerial caribou survey and a ground-based caribou vantage point survey were used to determine the distribution and relative abundance of caribou across the study area. The aerial caribou survey included 13 parallel transects, spaced 4 km apart. The caribou vantage point survey involved watching for caribou from six locations chosen by local hunters. No caribou were observed during these surveys. Results from the study area correlate with the Government of Nunavut Department of Environment (DoE) reported low caribou density estimates across South Baffin Island.

Peregrine staff and their contractors were on site from March 13 to April 18, 2014 and again from June 30 to September 10, 2014 (total approximately 3.5 months). During this time, no caribou were seen.

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## **Aerial Carnivore Survey**

Thirteen aerial carnivore surveys have been conducted since 2009. These surveys are most often conducted with the aerial caribou survey. No carnivores or their dens have been observed during these surveys; however, wolves and foxes have infrequently been observed and recorded by Peregrine staff and their contractors in past years. In 2014, Peregrine staff didn't see any carnivores, but one wolf track was reported.

An unconfirmed observation of a potential carnivore den south of Qamanialuk Lake, at least 20 km from the Priority Area was recorded. Carnivores can be sensitive to disturbance during their denning period and it will be important that this potential carnivore den site be evaluated in the next survey year.

## **Aerial Raptor Nest Reconnaissance Survey**

Over the ten aerial raptor and nest surveys have been completed within the Chidliak Project area since 2009. From these surveys, three cliff-nesting sites, previously occupied by Common Ravens, Rough-legged Hawks, Peregrine Falcons, and a Gyrfalcon have been documented and surveyed within the 3,083 km<sup>2</sup> study area. In August 2014 all known raptor scrapes and a stick nest weren't occupied. Since raptors show nest site fidelity and are sensitive to disturbances during the nesting season, a conservative 1.5 km set back distance is recommended near known active nests from early May to mid-August.

Over a 3.5 month period in 2014, Peregrine staff and contractors also observed two Gyrfalcons and eighteen Common Ravens.

## **Fish and Fish Habitat Surveys**

Two fish and fish habitat surveys have been conducted within the Chidliak Project area since 2009. In 2014, four lakes and four sites along the McKeand River were surveyed for fish, primary producers (periphyton and phytoplankton) and secondary producers (zooplankton and benthic invertebrates), and metal concentrations in fish tissues. In addition, a preliminary desktop study was completed to identify barriers to fish migration up the McKeand River (such as waterfalls or sections of the river with gradients greater than 20%).

Arctic Char (total of 73) was the only fish species captured. Their ages ranged between one and 19 years (n=30). Tissue mercury and selenium levels were above guidelines in several fish sampled in 2014. This includes six fish from Qamaniruluk Lake with tissue samples exceeding the mercury guidelines, and 24 fish tissue samples that exceeded selenium guidelines from each of the four lakes sampled. However, the average tissue mercury and selenium levels were comparable to other Arctic systems.

Primary and secondary producers present in the studied lakes and the McKeand River have relatively low densities and taxa richness. These findings are consistent with other Arctic habitats.

It is likely that each of the surveyed lakes support healthy populations of Arctic Char, and the McKeand River provides some foraging habitat for juvenile char and allows for dispersal. Currently, it is unknown if the McKeand River acts as a migratory corridor to anadromous char (a period of the life cycle in salt water) since there was insufficient data to determine if a permanent barrier to fish migration is present downstream. In order to better determine if barriers are present, downstream sections of the river should be visited in future years.