Executive Summary of Submission of – Polaris Mine Long Term Limnology, Water Quality and Effluent Monitoring Program

January 22, 2018

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The Polaris Mine's Type A Water Licence was amended on March 19, 2015. It authorized both environmental and geotechnical monitoring programs for the site. Part H of the Licence requires the Licensee to submit to the Board for approval, a Long Term Limnology, Water Quality and Effluent Monitoring Program.

The Licence has detailed requirements for the water quality monitoring program, however the Licence requires the monitoring program to take into account the recommendations of the April 2013 Azimuth Report (that was submitted as part of the Licence application) and addresses recommendations received during the final technical review of the Application and submissions received at the Public Hearing (documented in the March 19, 2015 "Nunavut Water Board Reasons for Decision Including Record of Proceedings"). Azimuth Consulting Group has prepared an updated monitoring program in response to this requirement. The additions to the monitoring program relate to improving the Quality Assurance and Quality Control (QA/QC) protocols. The updated QA/QC plan now includes:

1. A single **field duplicate** sample will be collected from at least one sampling depth for all parameters as a 'blind' sample to test precision of the laboratory;
2. A **field** blank will be carried into the field and analysed for all but dissolved parameters. These are sealed bottles, filled with laboratory supplied DI water that are opened in the field and then sealed again. This is a test to ensure that there is no site-related contamination.
3. An **equipment blank** sample. This tests the sampling pump and tubing to determine if there is any risk of cross-contamination from the equipment. Laboratory supplied distilled water is used to flush the pump and tubing and once flushed, bottles are filled for analysis of Group 2 and 5 parameters.
4. A **travel blank** sample will be taken. This is a sample similar to the field blank except that bottles for non-filtered parameters taken into and out of the field and treated in the same fashion as a routine sample, except that the container is unopened. This is a test to ensure that contamination did not occur during transport, either before or after sample collection, while enroute.
5. Finally, the laboratory supplied distilled water will be used to fill 2 bottles and analysed for a number of parameters to ensure that the distilled water is 'clean'.

The updated monitoring plan is being submitted for approval prior to undertaking this year's required water quality sampling of both Garrow Lake and Garrow Creek.

Sampling of the water column of Garrow Lake is required to be done from the centre of the lake where the water is the deepest (monitoring Station 262-3). It is planned to conduct this sampling in the spring while the lake is still ice covered. Samples are to be taken from the following depths (metres below surface):

- Water just at the base of the ice (2 to 3 m), 5 m, 9 m, 10 m, 11 m, 12 m, 13 m, 15 m, 20 m, 30 m, and 38 m (near the lake bottom).

Water will be sampled for both total and dissolved metals in addition to pH, dissolved oxygen and total suspended solids. A Hydrolab (or similar instrument) will also be used to measure water temperature, oxygen content, conductivity, and salinity.

Sampling of Garrow Creek is planned to be done in late July after the snow adjacent to the stream channel has melted. The sample is to be taken at the same location as previous samples were taken so the data can be compared to previous data. The sample will be taken at the same time as the

geotechnical inspection of the site is done. Prior to sampling, field parameters will be measured using hand held test meters (pH, temperature, conductivity). The water samples will be collected by wading into the creek and collect in bottles by hand. Analysis of the creek water will include pH, hardness, conductivity, salinity, TSS, and total and dissolved metals. The full range of 30 different metals will be measured including all those regulated under the Metal Mining Effluent Regulations. For Garrow Creek the QA/QC procedures will include:

- Field duplicate sample consisting of a second complete set of water quality parameters collected at least 15 minutes apart from the original (i.e., field replicate). This will confirm results of the first sample and ensure that at least one sample is acquired in the event of a bottle breakage during shipping or analysis.
- A field blank will be carried into the field and analysed for all but dissolved parameters.
- A trip blank will also be taken into the field.

Results of the sampling programs will be reported to the Nunavut Water Board no later than March 31st, 2020.