



Fish Habitat Management System for Yukon Placer Mining

Water Quality Objectives Monitoring Report (2009)

Prepared by

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Water Quality Working Group**

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The Fish Habitat Management System for Yukon Placer Mining replaced the *Yukon Place Authorization* (YPA) in 15 Yukon watersheds on April 11, 2008. Founded on principles of adaptive management and incorporating a risk-based approach to decision-making, the system is intended to balance the objectives of a sustainable Yukon placer mining industry with the conservation and protection of fish and fish habitat supporting fisheries

Adaptive management recognizes that the effectiveness of any management system is hampered by a degree of uncertainty and lack of knowledge. It seeks to improve the system by monitoring the effects of management actions, in order to learn from the results. The Adaptive Management Framework for Yukon placer mining is complemented by traditional knowledge and water quality objectives monitoring, aquatic health monitoring and economic health monitoring programs. The results should provide new information and a rational basis for making any adjustments required to achieve the two management objectives.

The water quality objectives monitoring program is governed by the Water Quality Objectives Monitoring Protocol. The Protocol describes the locations, timing, frequency and methods employed during sampling, as well as the methods used to analyze sampling data. Precipitation data was collected from a variety of sources to assist in the interpretation of results.

The water quality objectives monitoring program relies upon both continuous sampling and grab sampling. Continuous sampling is performed by automated instruments that pump water from the creek or river at a preset volume and at precise times each day. Grab samples are taken by personnel at a selected location, depth and time. Normally the quantity of water taken is sufficient for all the physical and chemical analyses that will be done on the sample. Grab sampling is also performed during sampling “blitzes”, when single grab samples are collected from as many sites as possible within a short timeframe in order to get a snapshot of the water quality in a watershed over a 24 hour period.

Fifteen watershed-based authorizations replaced the YPA in the Yukon River Basin. These authorizations contain a three year phase-in schedule for the sediment discharge standards that apply to each placer mining operation in the Yukon. This phase-in period allowed mining inspectors and the Yukon Placer Secretariat enough time to ensure that each operator fully understood the new regulatory requirements, and to make the physical changes necessary to achieve and maintain compliance at their site. The phase-in schedule contains the following requirements:

In 2008 – Licensed placer miners would be informed about the operating practices required to comply with the new system for managing placer mining

activity under the *Fisheries Act*. Inspectors and the Yukon Placer Secretariat would ensure that each operator is aware of the specific changes required at his or her site.

In 2009 – All licensed placer miners must be oriented to the Design Target and Action Level detailed within the authorization pertaining to the watershed they are operating in and, must comply with a Sediment Discharge Standard for mine discharge of no greater than 2.5 ml/L, or the standard stipulated in their existing water use license, whichever is more stringent.

And in 2010 – All operations must be oriented to operate within the Design Target and Action Level, and must not exceed the Compliance Level stipulated in the table of Sediment Discharge Standards for Placer Mine Effluent (Schedule 2) for the habitat suitability classification and the watershed in which the mine is located.

In 2009 water quality objectives were monitored in the following watersheds: Yukon River North, 40 Mile River, Klondike River, Indian River, 60 Mile River, Stewart River, McQuesten River, Mayo River, White River, Yukon River South, and Big Creek.

With specific exceptions, cases where the water quality objectives were exceeded in 2009 can likely be attributed to rain fall, either localized or basin-wide. This increased the amount of surface runoff and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters.

Increases in the volume of sediment laden ground and surface water entering the system added to the amount of sediment in the monitored watercourses. The ability of the receiving waters to dilute these inputs of sediment was negated by the re-suspension of streambed material and by the further erosion of stream banks that occurs with the increased flows that are generated by these rain events. These events lead to an increase in total suspended solids concentration and a decrease in water quality.

In the Stewart River watershed, the water quality objectives were likely exceeded because mining waste water from two streams contained fine grained, colloidal material that is very hard to settle and is easily put into suspension.

A more detailed description of the monitoring results for all watersheds is contained in this report.