

Protocol for Identification of Physical Constraints to Settling Pond Design

Klondike Placer Miners Association

Non-Technical Summary

Various implementation protocols are being developed to support implementation of the new Yukon placer management regime. The new regime is intended to provide a balance between a sustainable placer industry and the conservation of important fisheries and their habitat. The new regulatory regime is intended to ensure that a sustainable industry continues to operate with improved conservation of fisheries and their habitat.

In cooperation with other agencies, the Klondike Placer Miners' Association has been tasked with developing a protocol for the identification of physical constraints to settling ponds in order to assist placer miners and regulators operating under the new placer regime.

This report discusses various physical constraints such as valley width, valley gradient, and the steepness of valley walls which would make the construction and operation of an off-channel settling pond either impossible or impractical. It also recommends minimum valley widths required to construct suitable mining and efficient settling pond facilities subject to constraints in the Canadian Dam Safety Handbook and recommended practices in the recent government/industry collaboration report "Yukon Placer Guidebook":

- 1) Valley floor gradient – It is impractical to construct settling ponds valley floor gradients exceeding 3% regardless of the valley width due to limited sludge storage. There would also probably be insufficient gravel available for cross dam and dike construction.
- 2) Settling ponds constructed in steeper (>3%) valley floor gradients and/or in series of long narrow ponds generally would not have sufficient retention time to settle fine solids effectively.
- 3) The minimum valley width required to construct effective settling ponds is about 72 meters in shallow overburden (4 meters), about 96 meters in deep overburden (10 meters), and about 120 meters in very deep overburden (18 meters).
- 4) If the valley walls are steeper than 15% for deposits with shallow overburden (4 meters), at least some of the overburden will have to be stored in the main valley and the minimum valley width required to construct effective settling ponds would be about 50% wider or about 108 meters for shallow overburden (4 m), about 144 meters for deep overburden (10 m), and about 180 meters for very deep overburden (18 meters).

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