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Successful gold dredging in severe winters

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"The Bucket-Line Dredges have more than 30 years of successful winter dredging in Mongolia between them. The dredges are designed to operate at temperatures as low as minus 25C..."

ABSTRACT

In most regions of the world, all-year-round mining by gold dredges is straightforward. However the climate of Mongolia is sharply continental, causing the summers to be hot and the winters very cold. Ulaanbaatar has the dubious distinction of being the world's coldest capital city in winter.

ICE SURROUNDS THE BUCKET-LINE...

Thick ice surrounds all metal by the bucket-line, requiring vigilance and sometimes ice masses need to be knocked free. 24-hour working stops complete icing over.

MONITORING THE BUCKET-LINE...

The crew of the Bayangol Dredge have a clear view of the bucket-line at all times.

The author conducted field visits to examine the winter operations of large Siberian-built gold Bucket-Line Dredges: 3 in the Tuul Placer of the Zaamar Goldfield and 1 in the Bugant Goldfield. The dredges have excellent winterisation, being enclosed in a metal envelope and have central heating via a hot-water system driven by an on-board coal-burning boiler, rather than using the on-board electrical supply. An on-board coal bunker is more reliable than the electrical supply via the grid, and permits heating during mid-winter shut-down. Hot water and superheated steam is used for cutting ice free that might compromise the movement or safety of the dredge. Large ice masses build up near the bucket-line, and are knocked free from time to time.

The Bucket-Line Dredges have more than 30 years of successful winter dredging in Mongolia between them. The dredges are designed to operate at temperatures as low as minus 25C. The deeper water remains unfrozen and so permits movement and remains available as process water.

Dredging stops close to the end of December, in time for the crews to celebrate New Year in Russia. The dredges might be able to continue operating for a further month before the ice thickens too much. This merits assessment as it would increase gold production and profits. A limitation may be the winter performance of Draglines used to clear the





GIANT ICICLES ON THE OVERSIZE STACKER...

The oversized stacker at the rear of the Bayangol Dredge is enclosed and centrally heated, yet giant icicles form where the oversized tumbles out.

overburden from the dredge path. If a Cutter Suction Dredge removed the overburden, then all-year-round gold production may be feasible.

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FLOAT ICE AHEAD OF THE DREDGE...

Even though thick enough to walk on or to drive a truck across, the Bayangol Dredge cuts a path through it.

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