

WORLD PLACER JOURNAL

[VOLUME 1](#) [VOLUME 2](#) [VOLUME 3](#) [VOLUME 4](#) [AUTHORS](#) [EDITORS](#)

World Placer Journal - 2003 - Volume 3.

The world-class Tuul Placer in Mongolia

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ABSTRACT

Records of >2,400 boreholes in the Tuul Valley have been re-examined, allowing reassessment of the placers of the Zaamar Goldfield. The gold grade in the borehole logs have been re-plotted at 40cm intervals. The 'grand total' of boreholes in the main placers is in the order of 5-6,000. Examination of more boreholes is underway.

Every borehole was assessed to determine if it merited inclusion in the Economic Reserves. The economic cut-off was \$0.35 of income per TOTAL m³ mined (placer + overburden). The cut-off value of \$0.35 of income assumes a selling price of \$10 per gram of pure gold, after allowing for gold purity and after allowing for 95% gold recovery. The 95% refers to the 95% of the gold content as revealed by drilling, and therefore is 95% x (actual gold content MINUS losses during drilling MINUS losses during washing of the core samples).

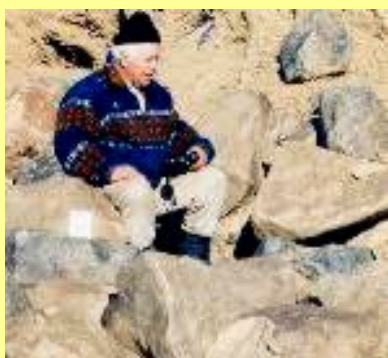
Special attention was devoted to determining if the main placers beneath the floor of the Tuul Valley are physically connected with each other. The conclusion is that indeed this is the case, at least for a remarkable 52km of the Tuul Valley. In recognition of the unity of the main placer, the term '**Tuul Placer**' is introduced.

The economic analysis of the >2,400 boreholes plus geological data shows that the Tuul Placer can be dredged profitably for the entire 52 kilometres of its known length. The Tuul Placer extends northwards from near the main Road Bridge where it is being mined by the [South Dredge](#) of Shijiir Alt downstream to the active mining of the [North Dredge](#) of Shijiir Alt. Immediately downstream of the North Dredge an acute pinch point constricts the Tuul's floodplain, but



OVERSIZE OF THE TUUL PLACER...

The typical size of oversize, easily dealt with by dredges and wash-plants. Notice the sub-rounded shapes typical of this braid-plain alluvial deposit.



GIANT OVERSIZE...

Gerrit Bazuin examining the largest oversize ever seen in the Tuul Placer. The sub-rounded blocks appear to have entered by rapid side-streams from the adjacent mountains,

The Tuul Valley has a "time-series" of alluvial terraces on its sides, with the modern floodplain being the youngest, and the terraces of increasing antiquity the higher they are on the valley sides. The highest terrace is therefore the oldest.

Therefore previous investigators consider that the the Tuul Placer beneath the modern floodplain is young, only slightly older than the floodplain itself.

But the present study show that, in some stretches of the Tuul Valley, the Tuul Placer strays underneath the lower terraces. Previously such anomalies were either overlooked or ignored, or the 'anomaly' was regarded as being a different placer, but such anomalies are now rather too numerous to be accounted for in this manner.

More extraordinarily, the Tuul Placer and the bedrock surface ('basement') show considerable vertical variations along the 52km length of Tuul Valley. Basement lows rather than being explicable as infilled old valleys as formerly assumed, are now seen to be self-enclosed rock basins 10-20m deep. Tectonism is the likely explanation, but the Tuul Valley has had almost no tectonism in historical times, and none of the terraces show any signs of tectonic deformation. This suggests that the Tuul Placer is *significantly older* than the sediments of the Tuul floodplain above it. Under this new hypothesis, a nearly planar discontinuity ('time gap') should be present separating the Tuul Placer from the floodplain sediments above it.

BELOW: LANDSCAPE OF THE TUUL PLACER ...

The Bayangol Dredge (left) is dredging southwards (left) leaving behind a broad expanse of mined out Tuul Placer (foreground). In the background (west) are steep slopes of rocks of Palaeozoic and Pre-Cambrian age, with the Tuul River at their base. The arcuate ribs of oversize (right) left by the dredge include red clay balls of Ulaan Placer of Neogene age and grey clay balls of presumed Cretaceous age. The Tuul Valley appears to have originated as a irregular rift valley in Neogene times as implied by the presence of the Ulaan Placer of Neogene age. The Tuul Placer may have formed in earliest Quaternary times from the first major temperate river system to use the rift as its axis.

the Tuul Placer passes through the constriction. Nearby the Tuul Placer rises westwards, presumably due to tectonics, beneath the West Terrace where it is being mined by Baganuur JSC and Ikh Temullel Ltd.

Downstream the Tuul Placer plunges into what was previously interpreted as being a concealed ancient valley. However boreholes show that this is a self-enclosed rock basin several kilometres in length. The Tuul Placer on the western border of this depression is shallow and economic.

Further downstream, the Tuul Valley snakes its way around the Big Bend, along with the Tuul Placer. An important splay of the Tuul Placer may continue north, but part continues downstream round the Big Bend where a shallow splay is being mined by Ikh Temullel Ltd beneath a terrace. Boreholes indicate continuity downstream with the placer beneath the Bayangol Alluvials currently being dredged by the [Bayangol Dredge](#) of Altan Dornod Mongol Ltd, and continuity with the placer beneath the Toson Alluvials where Monpolymet is assembling a dredge.

At the north end of Toson Alluvials boreholes show that the Tuul Placer continues uninterrupted around the left offset in the Tuul Valley. The Tuul Placer probably extends a further 10-20 kilometres further downstream (north) through Khos Khaas concessions to the Selenge Aimag border, but more drilling is required to confirm this northerly extension.

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Last modified: April 09, 2007



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