

WORLD PLACER JOURNAL

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World Placer Journal - 2003 - Volume 3 **Low-cost placer gold mining using fully mobile wash-plants**

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"A common error is to fail to pay as much attention to Wash-Plant mobility as to % gold recovery."



MOBILE MINING ON TOSON TERRACE...

Successful test mining of the Toson Terrace placer by Cold Gold Mongolia Ltd, the key being FULLY-MOBILE SCREEN & WASH-PLANT. Built in New Zealand and a big success in Mongolia. The wash-plant is moved to the placer, and so there is no trucking of the placer at all - a huge cost saving. [CLICK TO VIEW](#) the special article by Danny Walker.

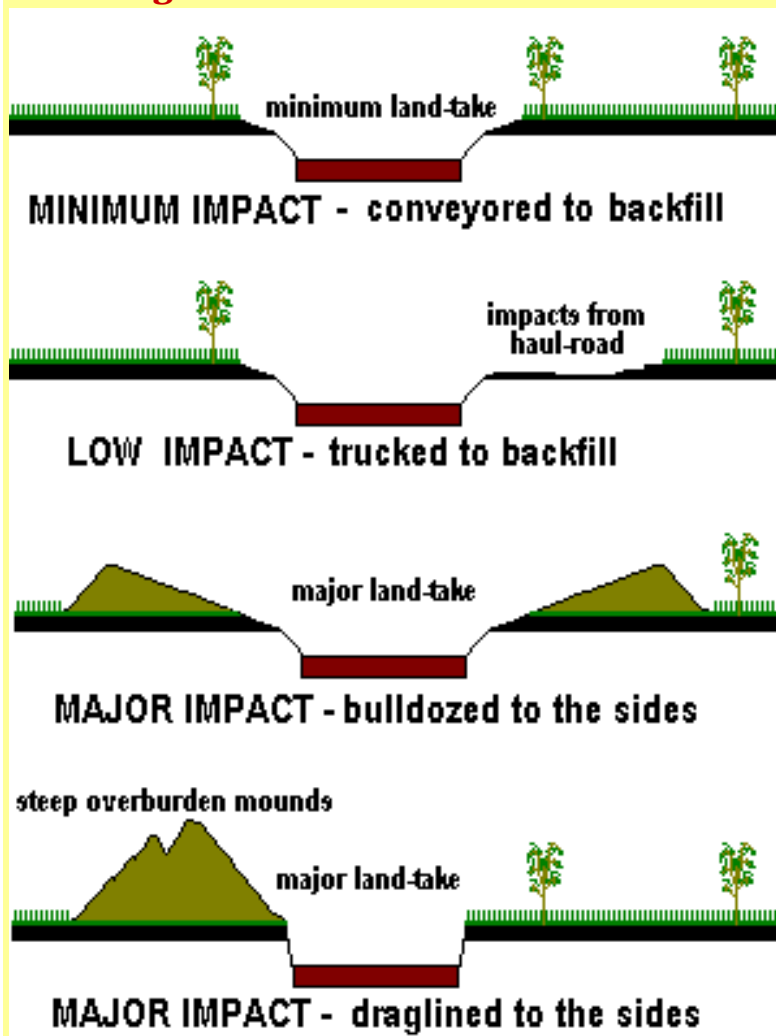
ABSTRACT

The profitability of placer gold mining operations is determined by more factors than many placer miners recognise until too late. This study is based upon field visits to 60+ placer gold mines in Mongolia, 5 in China, 2 in Kyrgyzstan and desk study of placer gold mines in Alaska, USA, South America, Africa, New Zealand and Australia. The study covered commercial operations processing >40m³/hour up to many hundreds of m³/hour. The study revealed a 'rule' whereby placer mines divide fairly readily into 3 classes:

a) Mines with Static Wash-Plants - very low-cost wash-plants with all pay-gravel trucked to them. These mines are profitable due to very low capital costs and low labour costs. However gold recovery is generally low, environmental impacts are high, and the cost of trucking ultimately proves to be a limiting factor. Such mines typically have many stoppages, but are still profitable.

b) Mines with fully-mobile Wash-Plants - much higher capital costs due to more demanding design and construction to minimise size and weight, and yet are still rugged. Typically the designers incorporate high % gold recovery systems. Gold recovery is high, and a hydraulic excavator feeds the Wash-Plant directly, without any trucking of pay-gravel. This is sustainable as the Wash-Plant is fully-mobile, being EASILY and QUICKLY moved every few hours, with only SMALL loss of production time. The Wash-Plant is light enough to be dragged on skids by the hydraulic excavator. Earth-moving equipment such as trucks or bulldozers is used but only for removal of the overburden. Such mines typically have high % gold recovery and operate for >20 hours a day without

WHAT TO DO WITH THE OVERBURDEN? New methods give immediate cost savings and safeguard the environment ...



Draglines cause major environmental impacts, by creating steep overburden mounds that are often left as derelict eyesores and consume a lot of land.

Bulldozing the overburden to the sides is almost as bad, often sterilising as much land as with a dragline. Not only are draglines and bulldozers bad for the environment, they are also inefficient, as all the material they moved has to be moved again!

Trucking the overburden to the mined-out areas is far less damaging to the environment, but trucking is expensive if distances are large, surmountable if there is a skid-mounted **Mobile Screen & Wash-Plant** kept very close to the mining face. The New Zealanders have led the way with this low-cost style of placer mining.

Pontooning is very easy if enough water is present and allows not only the New Zealand Mobile Screen & Wash-Plants to be punted, but even more cumbersome semi-mobile Wash-Plants (such as

stoppages. Such mines are highly profitable even with low grades.

c) Mines with semi-mobile Wash-Plants - these mines have high capital costs and typically have high % gold recovery systems. Gold recovery is generally high. Although a hydraulic excavator can feed the Wash-Plant this is possible for only part of the time, as the mining shifts away from the Wash-Plant. Some trucks are therefore used, and hence a new earth ramp has often to be built every time the Wash-Plant is moved. The Wash-Plant is not truly fully-mobile, being LESS EASILY and MORE SLOWLY moved, making it realistic to relocate every few DAYS or WEEKS when merry-go-round trucking becomes too expensive or when truck-loads decline. It is common to "not have enough trucks" to feed the Wash-Plant. The many hours required to move and restart the Wash-Plant results in a LARGE loss of production time. The Wash-Plant may be rather bulky and heavy to be dragged easily on its skids by the excavator. If mounted on a wheeled trailer, the trailer may bog down in soft ground, and the ground clearance of the trailer means that the Wash-Plant is now too high for direct loading from an excavator, although a wheeled hopper plus stacker unit can solve this. The weight and bulk of the Wash-Plant can be partially offset if the Screen and Wash-Plant are separate units, each on its skids, but this more than doubles the moving time, as the pipe-work and electrics of the 2 units must first be uncoupled and afterwards be coupled again. Earth-moving equipment such as trucks or bulldozers is again used for moving overburden. Such mines typically have high % gold recovery and should operate for >20 hours/day without stoppages, but are punctuated by frequent interruptions due to shortages of truck-loads, and longer interruptions while re-siting the Wash-Plant. Such mines are rarely profitable even with high grades.

A common error is to fail to pay as much attention to Wash-Plant mobility as to % gold recovery. A Fully-Mobile Wash-Plant is essential in order to be certain that the intended throughput of pay-gravel is actually achieved. A Semi-Mobile Wash-Plant is a recipe for probable failure, and typical symptoms are:

- Wash-Plant is on a wheeled trailer;
- Wash-Plant not moved hourly;
- Wash-Plant requires an earth-ramp;
- Trucks are used to move the pay-gravel;
- Trucking unable to supply enough pay-gravel;
- Stockpiling of pay-gravel anywhere at the mine; (Stockpiles lock up capital, and require expensive double-handling).

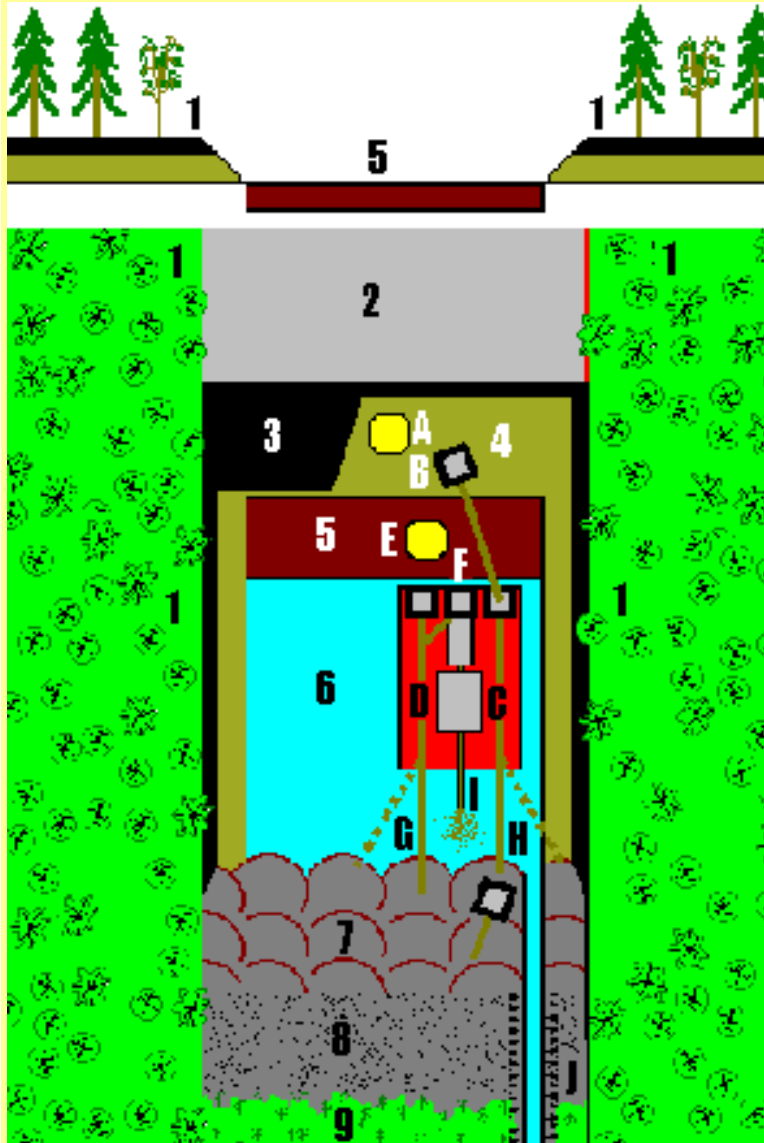
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heavy IHC jig systems) suddenly become truly mobile with impressive cost savings - trucks are no longer needed to transport placer.

Trucking can now be dispensed with altogether.

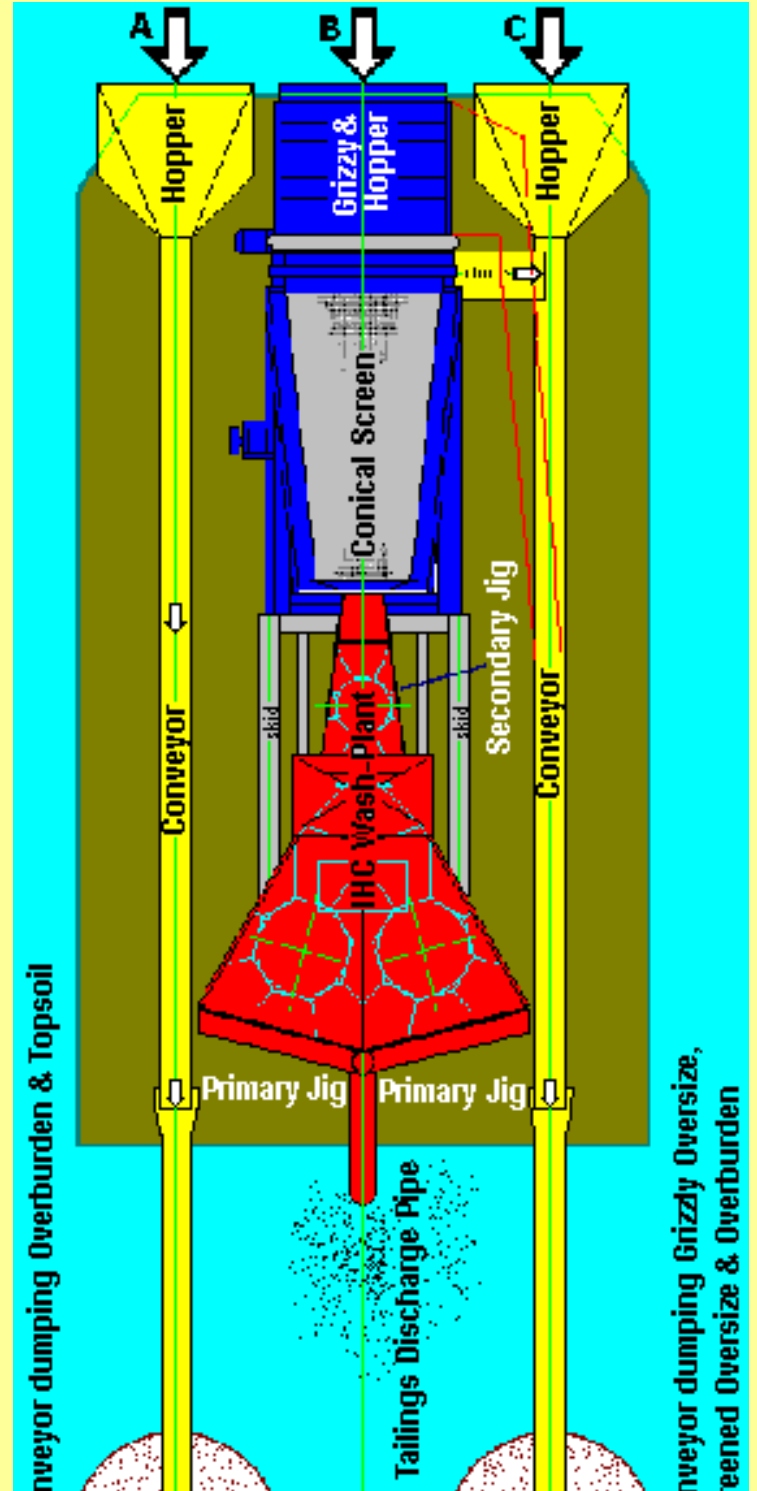
Pontoons have demonstrated the effectiveness of using conveyors for removing oversize to the rear of the Pontoon. Remarkably, until we focussed on the issue, nobody thought to go-the-extra-mile and consider using the same Pontoon as a 'stepping stone' for a 'bypass conveyor' to convey all the overburden and topsoil quickly and cheaply to the rear of the Pontoon.

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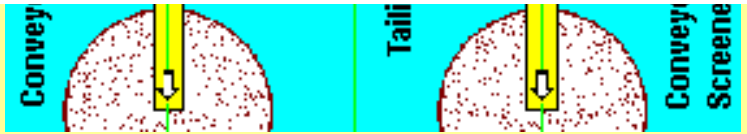


THE PONTOON 'STEPPING-STONE'... conveyors use the pontoon as a stepping-stone taking the overburden and topsoil to the freshly mined-out area at the rear of the pontoon.

Continuous rehabilitation is achieved, impacts are about as low as possible - and investment is



minimised and profits maximised as no trucks are required.



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