

# WORLD PLACER JOURNAL

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## World Placer Journal - 2004 - Volume 4. Progress towards a global BAT for placer gold mining

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***"BAT reduces operational costs and increases profitability. Rather than restoration of derelict mine sites, BAT ensures rehabilitation is continuous, integral with the mining ."***

### ABSTRACT

The placer industry is fragmented and conservative. Impacts can be severe but no global environmental guidelines exist.

The aim of the present study is to initiate a global Best Available Techniques (BAT) for placer gold mining. The author has reviewed placer mining and washing equipment and methods gathered worldwide, and made observations on more than 100 placer gold mines in Mongolia.

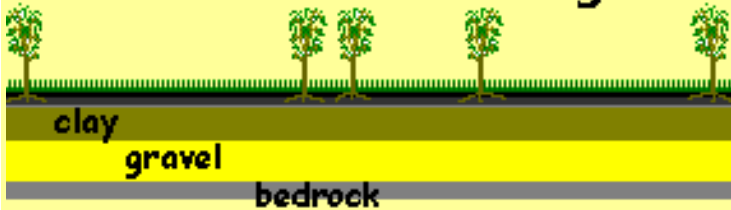
For a global BAT for placer gold mining, the following high risk activities need to be eliminated (% in brackets refer to placer gold mines in Mongolia):

- a) dredging in a flowing river channel (0%);
- b) failing to conserve topsoil (99%);
- c) overburden in 'temporary' dumps (98%);
- d) bulldozing overburden to the sides (20-30%);
- e) use of low % gold recovery systems (98%);
- f) <90% gold recovery during drilling (30-60%);
- g) resource not based on economics (100%);
- h) abstracting water directly from rivers or wells with little attempt to recycle (80%);
- i) settling ponds too simplistic (80-90%);
- j) use of process chemicals (2-3%);
- k) wash plants use water monitors that demand excessive water and large settling ponds (80-95%);
- reclamation delayed until after mining (99%).

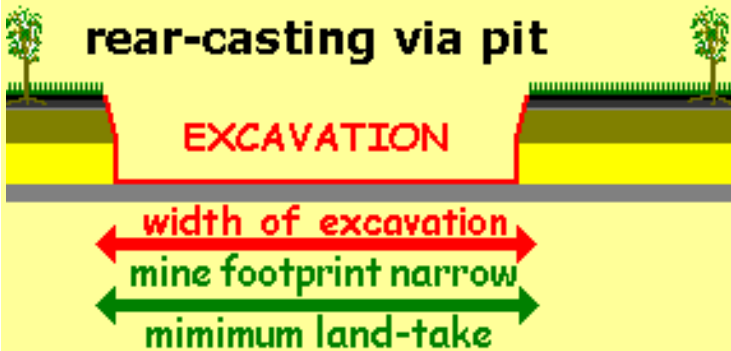
To create a global BAT for placer gold mining, the following progressive features are considered to be essential:

- a) topsoil stripped and re-spread within 24 hours, so conserving soil fertility, soil moisture, soil invertebrates,

## before start of mining



## rear-casting via pit



## rear-casting via edge



## after rear-casting



### REAR CASTING IS BAT...

Rear casting is a feature of efficient placer gold mines that can rear-cast easily because they use a fully-mobile wash-plant that keeps moving forward as the mining face advances. Rear-casting also required the tailings pond to double-up as a water recycling storage reservoir and - remarkably - for the tailings pond also to move forward with the wash-plant. The compactness of the footprint is remarkable, and distances are short to permit single handling of overburden and topsoil with continuous rehabilitation.

seed bank, fungi etc.;

b) overburden stripped and re-spread within 24 hours by single handling, so eliminating 'temporary' mounds of spoil;

c) wash-plants fully mobile, directly receiving pay gravel from the mining machine (e.g. hydraulic excavator or dredge) so eliminating trucking of pay gravel. Examples of a mobile wash plant are a floating wash plant (on a pontoon or dredge) or a land-based skid-mounted or wheeled trailer mounted wash-plant that is light enough to be moved quickly several times a day to keep up with the mining operations;

d) wash-plants always recover at least 85% of the gold content of the pay gravel fed to them;

e) when dredging or pontooning, fine tailings are spread on top of the washed coarse tailings to create a naturalistic fining upward soil profile; and

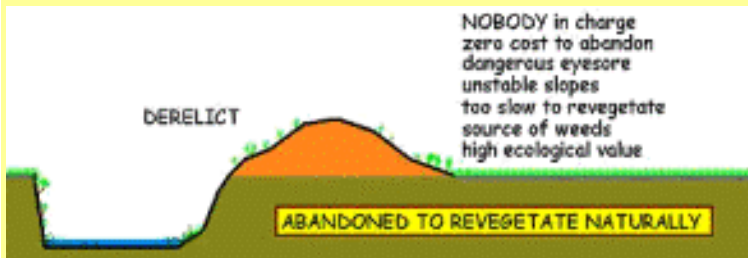
f) implementation of a full Environmental Impact Assessment (EIA), Environmental Protection Plan (EP1P); Environmental Monitoring Plan (EMP) and a continuous Mine Rehabilitation Plan.

Attention is drawn to the Yalbag Mine of Cold Gold Mongolia Ltd as a candidate for the proposed global BAT for placer gold mining in the Selenge watershed. This placer mine ([CLICK TO VIEW](#)) used completely mobile skid-mounted New Zealand trommels that achieved >90% gold recovery by hydraulic riffles, and replaced the topsoil quickly on top of washed coarse tailings and overburden as a continuous process with less than a 24-hour turnaround.

Therefore the proposed global BAT is demonstrated to be possible, practical, achievable and affordable.

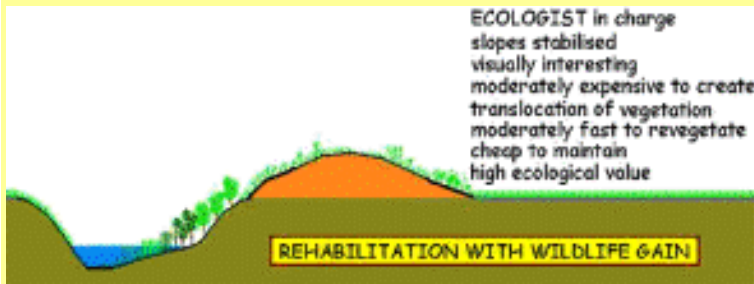
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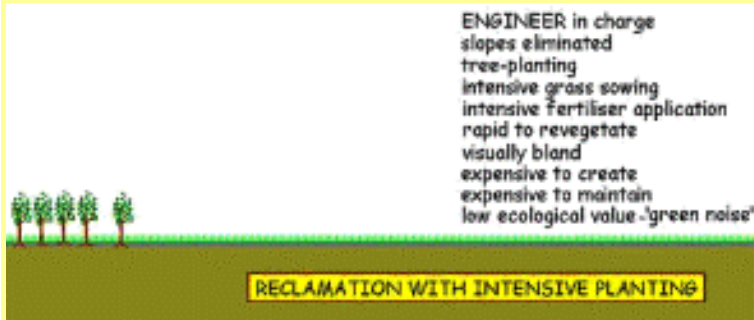
### DERELICT MINE SITE...

Not BAT, for although wildlife gain may be large, there are likely to be hazards and steep slopes.



### FRUGAL INTERVENTION...

This is BAT, being low-cost yet enabling wildlife gain to be maximised via diverse habitat mosaics. Re-vegetation may be slow, but the end result is a biodiversity better than can be achieved by intensive planting. A higher degree of naturalness and consequent biodiversity is attained by allowing the seral change of local species of plants and animals.



### INTENSIVE INTERVENTION...

BAT if - and only if - the very high cost is justified by the potential high land site value that might be created by such intensive intervention. Usually this is BAT only in intensive agricultural regions or in proximity to a town or city. There will normally be acute wildlife loss, rather than wildlife gain, and the low biodiversity may warrant the term 'green noise' as the site might only make sense to humans.

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