

## Mining and It's Influence to the Watershed of Orhon River

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Mining and mineral resource development activities have been a key source of environmental and socio – economic impact to the Orhon river watershed for last 40 years. This paper identifies mines and areas of mineral resource development potential, existing information on their extent and observable environmental and socio – economic impacts, and models for effective regulatory control and land and watershed restoration.

Major mines and mineral processing facilities from the period of socialistic time were abandoned without consideration of reclamation or land restoration plans resulting in impacts to water resources riparian plants and fish.

The largest of these facilities in the Orhon river watershed include a copper – molybdenum complex at Erdenet; coal mines near Darkhan, and extensive placer gold operations along the Tuul River and other tributaries of the Selenga, for example gold mining complex near Zaamar on the Tuul river tributary of Orhon river which belong to the Selenge river watershed. The most extensive gold mine proposals in 2004 are hardrock operations at Boroo, which announced achievement of commercial production in March, 2004 and placer operations at Zaamar along a 50 km stretch of the Tuul River.

Impacts of mines and mineral processing detected in the Orhon river watershed include:

1. Increased sediment loads and associated habitat damage at gold operations;
2. acidic drainage at hard rock mines;
3. mercury pollution from the release of mining re-agents;

4. And damage to riparian areas including habitat for endangered sturgeon and taiman
5. Populations from riverbed disruption resulting from dredge mining methods.

Socio – economic impacts include boom and bust conditions at the town of Zakamensk due to the rise and fall of the tungsten – molybdenum operations; rapid population growth near the Erdenet and Zaamar mining complexes in Mongolia.

Mongolia have recently adopted legislation regarding management of mining and its impact. Compilation of baseline data from which impacts can be measured and inspection and enforcement mechanism are severely limited. Operations of international mining companies and those funded by international financing institutions are subject to international standards and norms identified in corporate or funding institution policy.

Effective application of international standards and norms is a objective of regional policy agencies and nongovernmental organizations. As metal prices rise and contemporary mineral exploration methods are applied to deposits identified during the socialistic era, interest and development of minerals is likely to continue to increase in the Orhon River watershed. Effective enforcement of exiting laws, application of international standards for pollution prevention, reclamation planning. And financial guarantees, and restoration program targeting inactive and abandoned mines are needed to minimize or eliminate impacts of existing facilities and future operations.