

Copper Mining Processes in Chile: learning from past impacts

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The Situation

- **Copper Mining is one of the most important economic activities in Chile**
- **Copper production has increased from ca. 700.000 metric tones in 1970 to more than 3 500 000 metric tones in 1996**
- **This production representing ca. 25 % of the world production returns every year more than U\$\$ 5 300 x 10⁶**
- **Copper mining is based mainly on 10 open or underground mines, spread along the Andes Mountains on the Atacama Desert**

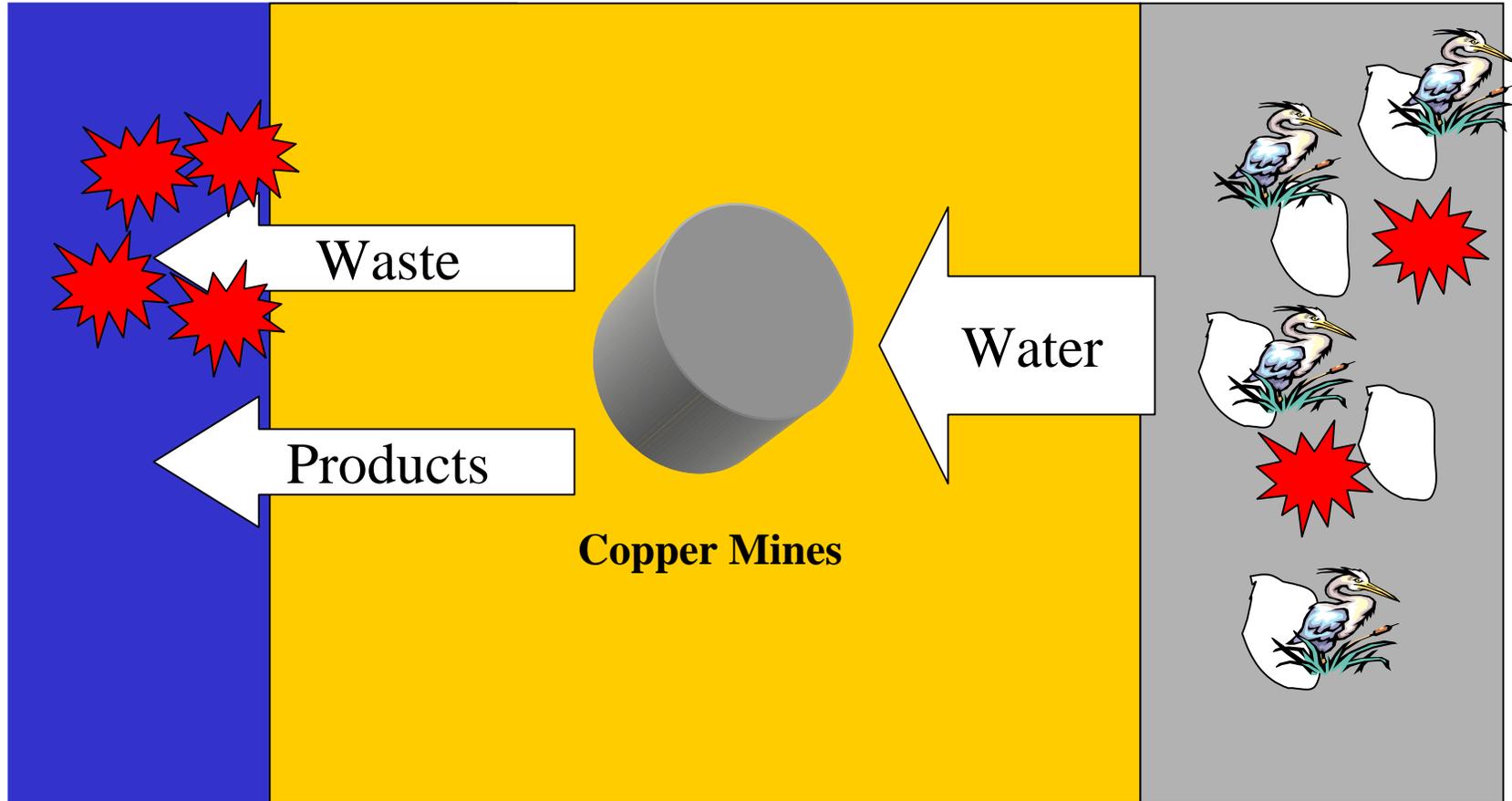


Copper Mining and the Environment in Chile

Pacific Ocean

Atacama Desert

Altiplano



History of Impacts

(El Salvador Copper Mine)

1938-1975

- Untreated copper mine tailings were routed to the Salado River bed and disposed directly onto the Shoreline of Chañaral = 150 million tones of waste

1975-1990

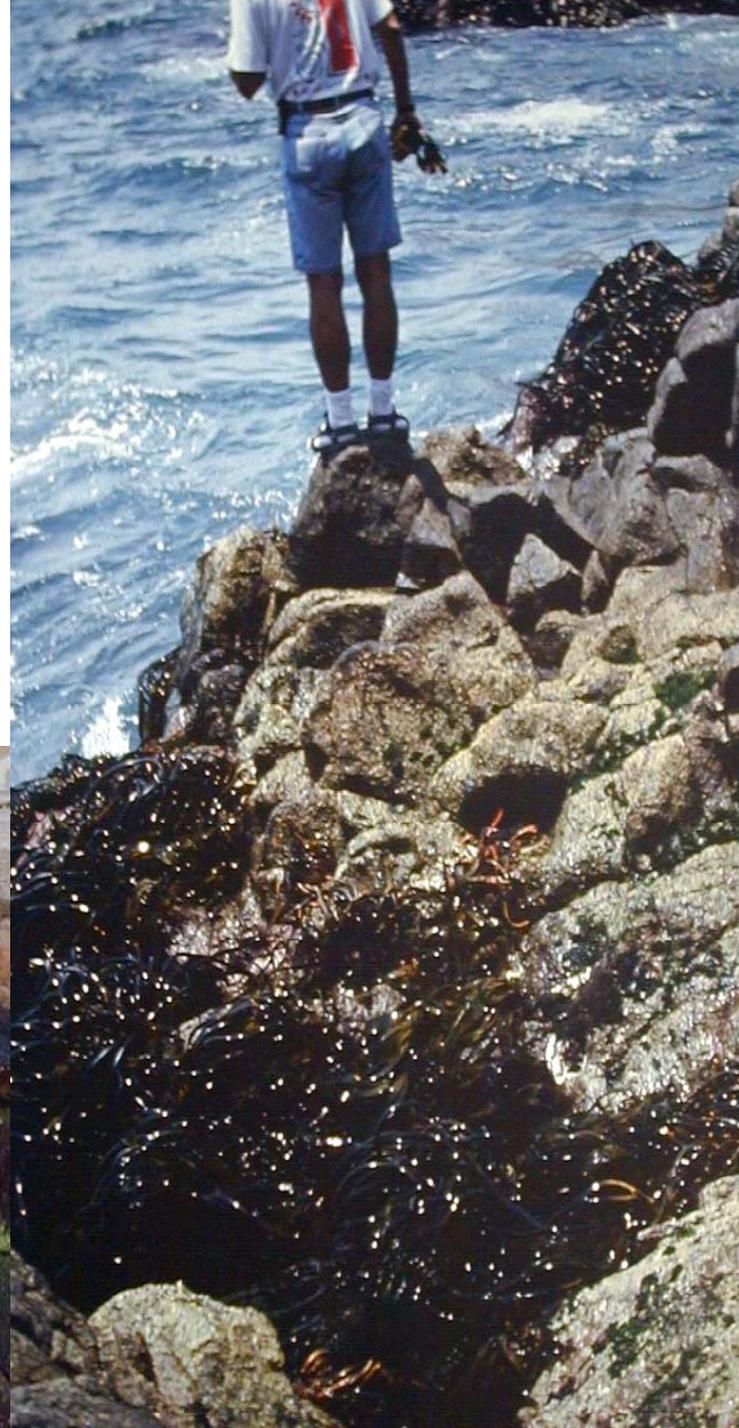
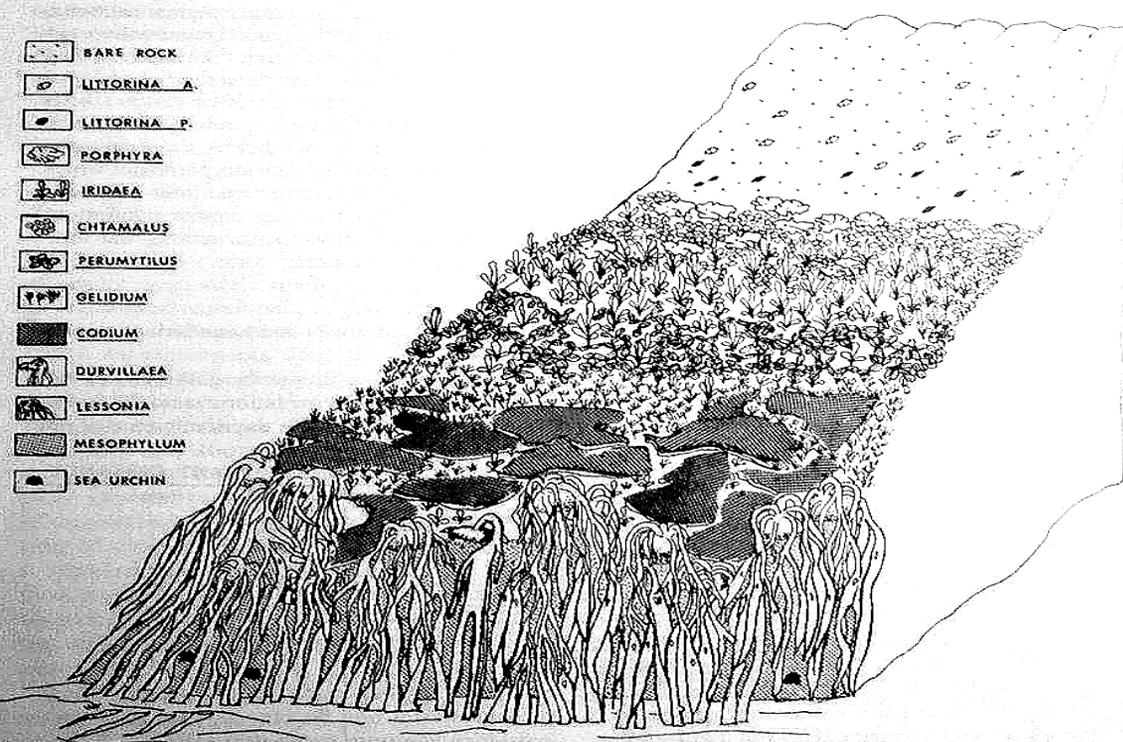
- The disposal site was moved 8 km north to a new location (Caleta Palito) = 126-150 million tones of waste

1990-present

- The disposal of untreated tailing waste was Banned
- The impacts on the shoreline and rocky intertidal Communities were analysed







The results of the Impacts analysis were considered into the Chilean Environmental Policy Law (1991-1994) and into the Environmental Mining regulations

-The regulations include:

Environmental Impact Assessments

Baseline

Major Impacts Predictions

Mitigative and/or compensative actions

Monitoring and surveys

Since then (1991) several new mining projects incorporated the regulations...

La Escondida Copper Mine

- Started in 1990
- Produce 932,699 metric tons/year (28% of the national production)
- Have an area of influence from the mountains to the sea
- Voluntary application of the environmental regulations given in the new Environmental Law

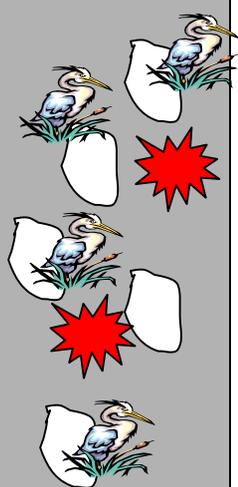


Monitoring



Copper Mines

Monitoring



Pyura stolonifera

- A tunicate widely distributed over the rocky intertidal communities of Australia and South Africa. In Chile it is found exclusively within the bay of Antofagasta**
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 - Almost half of the geographical range falls within the coastal area of Minera Escondida.**
 - It constitutes one of the important commercial resources in the bay area**
 - The EIA of la Escondida defined P. Stolonifera as a key indicator for the environmental quality status of the bay**
 - An extensive and intensive monitoring program of P. stolonifera population was established**
- = no impacts has been detected, more than 20 scientific publications were produced over four years, and 2 PhD Thesis were funded**
- A successful fishery management model was established**

from past experience....

The Future.....

- To continue with the Environmental Policy Law establishment process**
- To motivate and coordinate the relationship between Scientist, Private Initiatives and the government**
- To increase the information transfer between Environmental Managers and the Capitalists**