

Analysis of the Mongolian Tanning Process and Wastewater Treatment

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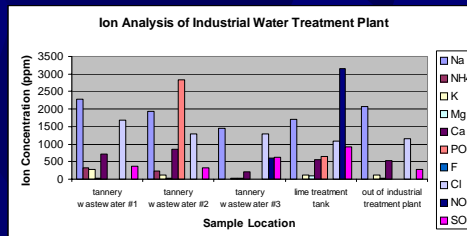
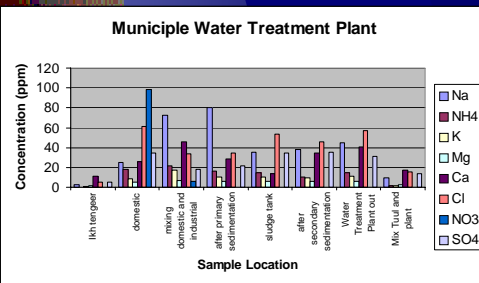
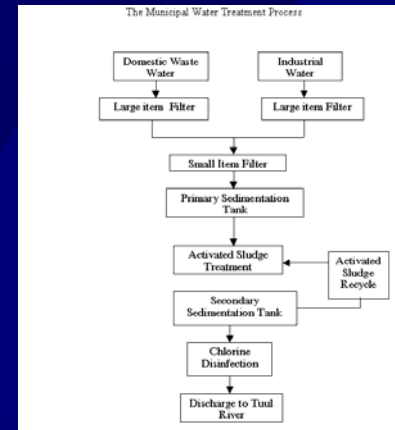
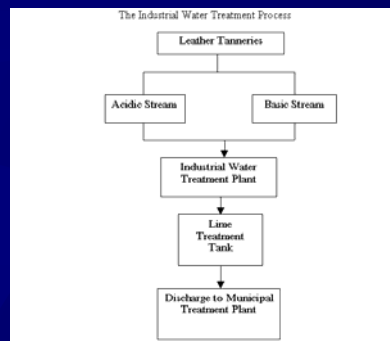
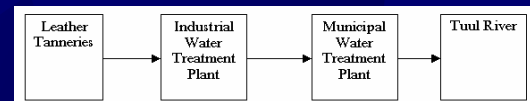
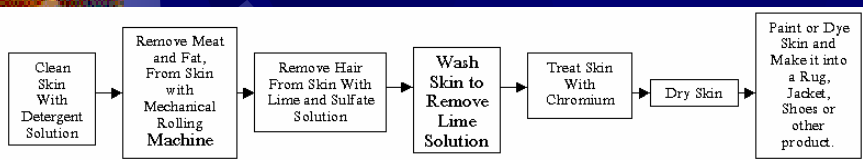
Abstract:

A study of the Mongolian tanning process and subsequent wastewater treatment was performed. The tanning of animal skins is an important industry in Mongolia. It was found that the current water treatment methods for the tannery wastewater are very poor and need improvement. The industrial water treatment plant is not properly removing chromium from the wastewater. There are several ways that the pollution from this industry can be reduced, improving the water treatment process, introducing a chromium recycle stream, and redesigning the tanning process to no longer use chromium.



The Mongolian Leather Tanning Process

Mongolian Water Treatment Methods



Chromium Concentrations	mg/L
new chromium tank	2208
used chromium tank	1271
#1 tannery wastewater	1.12
#2 tannery wastewater	0.65
#3 tannery wastewater	0.88
lime treatment tank	1.234
out of industrial treatment plant	1.747
into municipal plant	0.3
out of municipal plant	<.1
Tuul River	<.1

Location	pH	Cond (mS)
new chromium tank	2.94	>20
acidic skin softening tank	1.73	>20
defatting tank	9.9	3.18
cleaning tank	8.04	1.7
tannery wast water #1	7.42	3.8
tannery wastewater #2	11.6	7.8
tannery wastewater #3	12.1	9.98
flow out of industrial treatment plant	11.8	8

Recommendations:

- Educate tannery owners and workers about chromium pollution and convince them that it can be a serious problem
- Implement chromium recycle streams in the tanneries
- Improve the industrial water treatment process by acidifying wastewater to pH of 9 to increase chromium precipitation
- Use modern tanning methods that do not use chromium salts
- Improve tannery infrastructure to be able to reliably provide both an acidic stream and a basic stream to the industrial water treatment plant
- Encourage foreign development assistance for the tanneries and the water treatment plants