PORCUPINE GOLD MINES CYANIDE CODE CERTIFICATION

TRAINING | **HANDLING AND STORAGE** | **WORKER SAFETY**

THE INTERNATIONAL CYANIDE MANAGEMENT CODE

The **"International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide In the Product of Gold"** (Code) was developed by a multi stakeholder Steering Committee under the guidance of the United Nation Environmental Program (UNEP) and the then International Council on Metals and the Environment (ICME).

The Code is an industrial voluntary program for gold mining companies. It focuses exclusively on the safe management of cyanide and cyanidation mill tailings and leach solutions. Companies that adopt the Code must have their mining operations that use cyanide to recover gold audited by and independent third party to determine the status of Code implementation. Those operations that meet the Code requirements can be certified. A unique trademark symbol can them be utilized by the certified operation. Audit results are made public to inform stakeholders of the status of cyanide management practise at the certified operation.

The objective of the Code is to improve the management of cyanide use in gold mining and assist in the protection of human health and the reduction of environmental impacts.

GOLDCORP'S INVOLVEMENT

July 25, 2007 - The International Cyanide Management Institute (ICMI) accepted the application of Goldcorp Inc. to become a signatory to the International Cyanide Management Code. By becoming a signatory, Goldcorp has committed to following the Code's Principles and to implement its Standards of Practice, and to have verification audits of its individual operations conducted by independent third-party auditors within three years of their initial application, and every three years thereafter. The purpose of the verification audit is to evaluate an operation to determine if its management of cyanide achieves the Code's Principles and Standards of Practice. Operations will be certified if found in compliance with the Code, and will be de-certified if ICMI determines that they no longer comply with the Code.

HISTORY OF CYANIDE IN MINING

Cyanide was first used for gold extraction purposes in 1889 in New Zealand, resulting in a dramatic increase in gold recoveries. By 1892, six cyanidation plants were operating within that country. Recoveries within the operations improved from 40%-50% to 85% - 95%. Alternative complexing agents for gold, such as chloride, bromide, thiourea, and thiosulfate form less stable complexes and thus require more aggressive conditions and oxidants to dissolve the gold. This explains the dominance of cyanide as the primary reagent for the leaching of gold from ores since its introduction in the later part of the 19th century. Today, approximately 85% of the world's gold is produced through the cyanide leach process.

CYANIDE FACTS AND MYTHS

Facts

- Cyanide is a building block of DNA and is present in everyone's blood
- Fewer than four fatal cyanide accidents have occurred in North America in Mining, in over 100 years of cyanide use.
- 85% of the world's gold is produced through cyanide leach process
- Cyanide is contained in approximately 110 different plant families.
- Cyanide can be manufactured, stored, transported, used and disposed of in a safe manner.

Myths

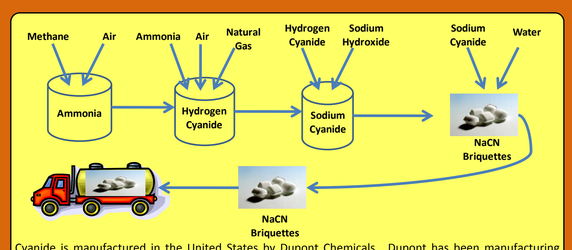
- There are many annual deaths from the use of cyanide in mining.
- Cyanide is merely a convenience in recovering gold from mined ores; other methods are comparably economical and efficient.
- Cyanide is radioactive
- Cyanide is a heavy metal.
- Cyanide is cumulative, carcinogenic and teratogenic.

CERFTIFICATION SCHEDULED FOR 2010!!!

DIALOGUE | **PRODUCTION** | **TRANSPORTATION**

LIFE OF CYANIDE

CYANIDE PRODUCTION

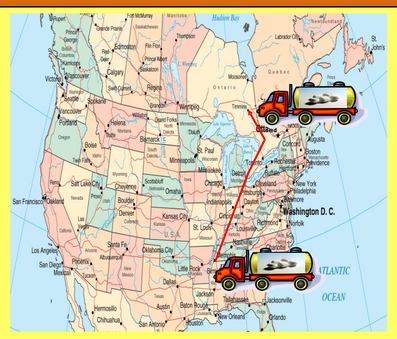


Cyanide is manufactured in the United States by Dupont Chemicals. Dupont has been manufacturing sodium cyanide for over 40 years. As required by the international Cyanide Management Code, Dupont Chemicals has been subject to certification.

This technology produces sodium cyanide (NaCN) by reacting hydrogen cyanide (HCN) and sodium hydroxide (NaOH). The reaction and crystallization steps are performed in a continuous vacuum crystallizer which takes advantage of the heat of reaction and simplifies unit operations. Equipment design and operating parameters control the decomposition ad polymerization side reactions to maintain a high quality finished product. The crystals in the process slurry are separated and partially dried with hot air in a combined rotary filter/dryer system. Drying is completed on the filter/dryer and the crystals are gravity conveyed to a briquetter system. The sodium cyanide is compacted into briquettes and excess product between the briquettes is removed in a rotary screener and recycled back to the briquetter system for re-compaction. Briquetted product is then placed in the package of choice: drums, bags, boxes or trucks.

Step #1

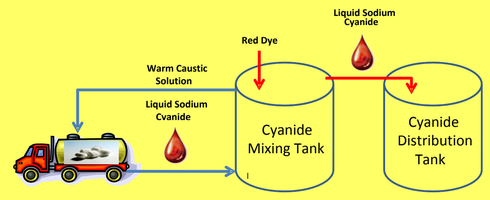
CYANIDE TRANSPORTATION



Sodium Cyanide Briquettes are loaded into tanker trucks in Memphis, Tennessee. The tanker trucks are made of stainless steel and are double-walled for added protection. The truck travels approximately 2000 kilometres to reach Porcupine Gold Mines. The truck always travels with two drivers and Porcupine Gold Mines is notified when the truck is in transit.

Step #2

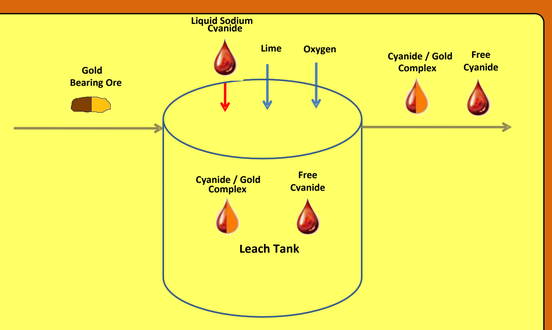
CYANIDE OFFLOADING AND MIXING



Sodium Cyanide is offloaded at the mill complex within the confines of a concrete pad. The offload process consists of re-circulating warm caustic solutions (pH 13) through the tanker truck until the briquettes have liquefied. Once the dissolution process is complete, sodium cyanide solution is transferred into the sodium cyanide distribution tank. Red dye is added to the solution to ensure cyanide can be readily identified in the event of a leak. An alkaline pH is always maintained to reduce the possibility of hydrogen cyanide generation.

Step #3

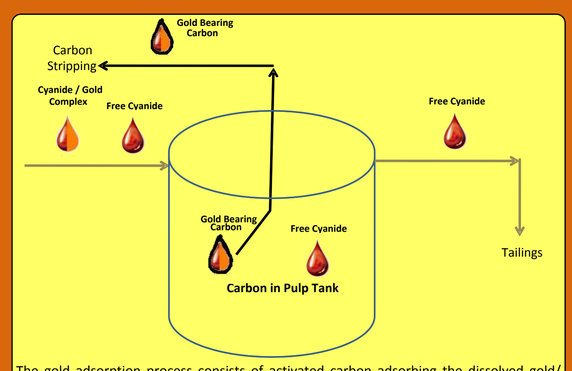
GOLD EXTRACTION



The gold extraction circuit (cyanidation) includes gold-bearing ore flowing through multiple tanks containing sodium cyanide lime and oxygen. In cyanidation, metallic gold is oxidized (oxygen) and dissolved in an alkaline (lime) cyanide solution. The oxidant employed is atmospheric oxygen, which, in the presence of an aqueous solution of sodium cyanide, causes the dissolution of gold.

Step #4

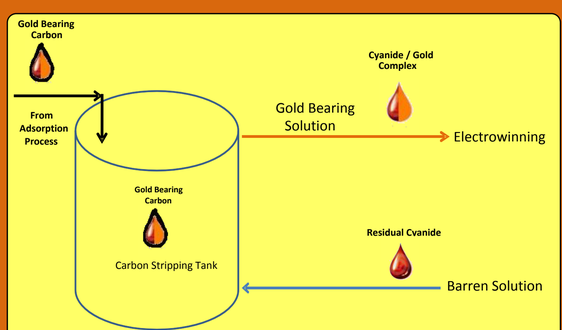
GOLD ADSORPTION



The gold adsorption process consists of activated carbon adsorbing the dissolved gold/ cyanide complex in an agitated pulp environment. PGM utilizes 6 carbon in pulp tanks each equipped with screens to ensure carbon remains with the desired tanks while allowing the gold process stream to flow through to tailings. Fresh carbon is added to the circuit based on inventory and reactivity levels.

Step #5

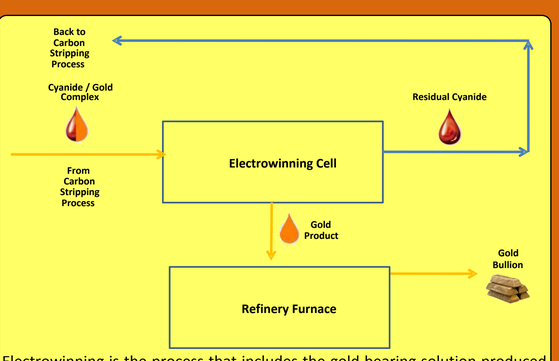
CARBON STRIPPING



Carbon stripping is a process by which warm solution (approximately 285 degrees) containing Sodium Cyanide and Sodium Hydroxide is pumped through the carbon stripping vessel, allowing the gold to desorb from the carbon. Fresh liquid sodium cyanide is added to the process to enhance the stripping process. Each stripping cycle equates to 8 tonnes of carbon and takes approximately 12 hours to complete.

Step #6

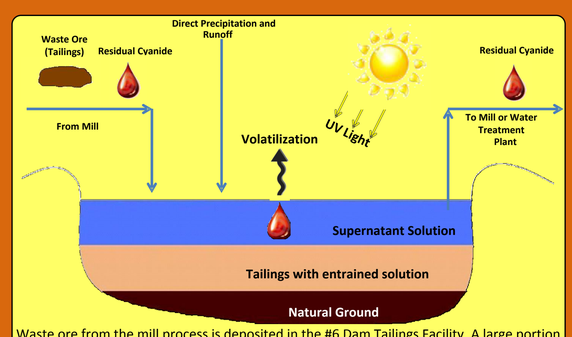
ELECTROWINNING



Electrowinning is the process that includes the gold bearing solution produced from the carbon stripping process flowing through a vessel containing electrodes (cathodes and anodes). Through the process of electron exchanges, the gold is deposited on the cathode. Any residual cyanide is pumped back to the carbon stripping process for further re-use purposes.

Step #7

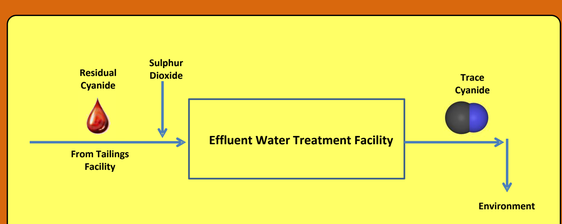
TAILINGS



Waste ore from the mill process is deposited in the #6 Dam Tailings Facility. A large portion of water in the facility is re-circulated back to the mill for re-use purposes. Cyanide within the tailings facility degrades naturally through a number of processes. Most Cyanide is degraded by volatilization of Hydrogen Cyanide. This results due to the fact that the pH is lowered through the segregation of solids and liquids, through a significant amount of rainwater and runoff addition and through the uptake of CO_2. Also, the facility allows for aeration processes to occur.

Step #8

EFFLUENT WATER TREATMENT



During the summer months, surplus tailing water undergoes a water treatment process before discharge to the environment. Cyanide in the tailings water is destroyed by means of a Sulphur Dioxide Cyanide Destruction System. The destruction process produces cyanate by oxidizing the free and cyanide-bound metal complexes. Under certain circumstances, copper sulphate and air are injected to serve as catalysts for the process. The remaining metals are precipitated through lime, ferric sulphate and flocculant additions. Before discharge, the effluent water is pH adjusted using Carbon Dioxide and EDTA (ethylenediaminetetraacetic acid) is added for toxicity reduction purposes.

Step #9

EMERGENCY RESPONSE | **OPERATIONS** | **DECOMMISSIONING**

CARE ACT THINK — SAFE ENOUGH FOR OUR FAMILIES