



Leading Green-Tech Company

DRINKING WATER & WASTEWATER TREATMENT

AFRICA CLIMATE RESILIENT INFRASTRUCTURE SUMMIT

Former UN Secretary General, Kofi Annan:

"Access to potable water in adequate quantity is a vital requirement for the survival, health and social economical development of all of humanity. Despite that, we keep on pretending that fresh water is an internal resource that can be found abundantly.
BUT THAT IS NOT THE CASE."



Important to Remember

- 1,000,000,000 of the earth's population has no faucets, rivers or lakes in their vicinity.
- One third (33%) of the world's population resides in regions where the water shortage is either severe or moderate .
- The demand for water **doubles** the rate of the population growth.
- In 25 years, the allocated amount of water per person be reduced in **half**.
- 80% of all diseases and more than 33% of all deaths in developing countries are caused by the consumption of polluted water.
- Only 20% of the world population enjoy the luxury of flowing water in each faucets

The Pollutants

- High Turbidity
- Low PH (Acidic Water)
- High levels of Cyanide
- High levels of Arsenic & other Heavy Metals
- High levels of Mercury
- High Conductivity
- High concentration of Fluorides
- High concentration of Iron
- High concentration of Salinity

The Ramifications

- Arsenic- heavy metals can have a direct impact on the health of the water drinker. When arsenic is found in water with concentrations that are higher than allowed by the potable water standards, the water becomes toxic for human consumption and is disqualified as drinking water. Arsenic causes cancer, destruction to the nerve system, damages to various body parts and more.
- Mercury- mercury exposure impacts the nerve system and can cause, among others, shakings, sleep deprivation, memory loss, headaches, sensory and motoric capability reduction, cognitive reduction, changes in behavior, tingling, obscured vision and a feeling of depression.
- Fluorides- fluorides in high concentrations causes damages to the teeth and bones
- The availability of quality water for drinking, bathing, irrigation, agriculture and fishery is reduced
- The cost of water treatment rises higher and higher as more pollutants are added to the water
- A high mortality rate due to poisoning!



The Sources of Pollutions

- Legal Mining
- Illegal Mining
- Lower grade agricultural activity, destruction of forests for mining and settlement
- Discharge of waste water from industrial zones and urban settlements
- Disposal of garbage from big settlements
- Bad sanitation



P2W

Overview

- Privately-owned.
- Established in 2005.
- HQ- HQ & Operation sites and regional management- Ghana (180), RSA USA, Russia.
- A leading water company, owner of breakthrough patented technology for treating the most hazardous contaminants in the industry, municipal and mining sector.
- P2W's approach for water treatment is green and probably one of the most sustainable processes in the market.



P2W Company

*This is How P2W Replaced the Need for Chemicals and
Membranes in the Treatment Process*



P2W's Breakthrough Process

Highlights

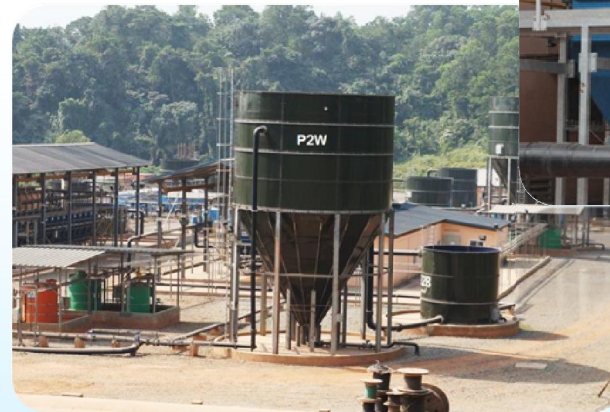
- Electrochemical process with **proven low** consumption of energy.
- **No chemicals** are added or involved in the treatment process.
- Capable of handling different contaminants **SIMULTANEOUSLY**.
- No membranes participate in the process – **no byproduct of brine**.
- Creates **less sludge** compared to other known technologies.
- Recovers water of **97% ratio**.
- **No lime**, chemicals or membranes participate in the removal of sulfates or in the reduction of conductivity.



*We preserve the environment
while saving lives*

5 Technologies – One System

- Heavy Metals Removal.
- Cyanide Destruction.
- Arsenic Removal.
- Conductivity Reduction
(sulfates removal without the use of membranes).
- Slurry Treatment.



Sulfate reduction

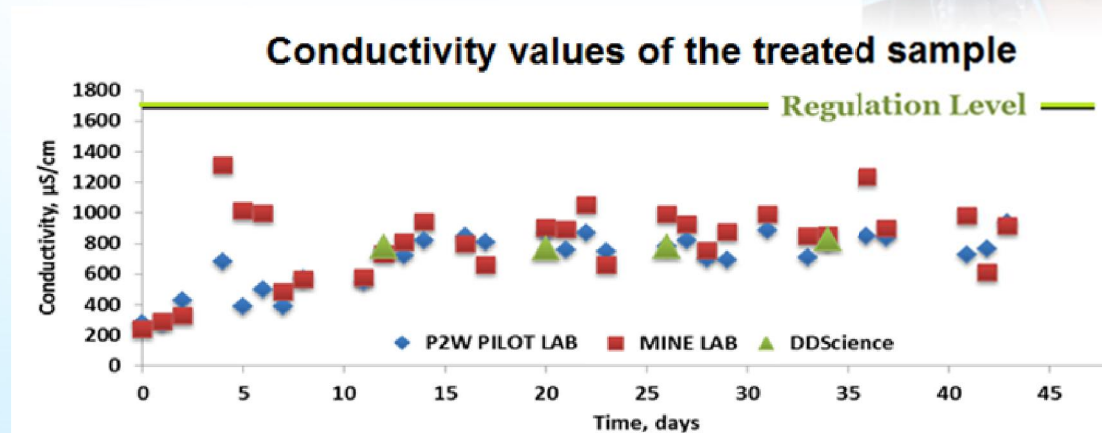
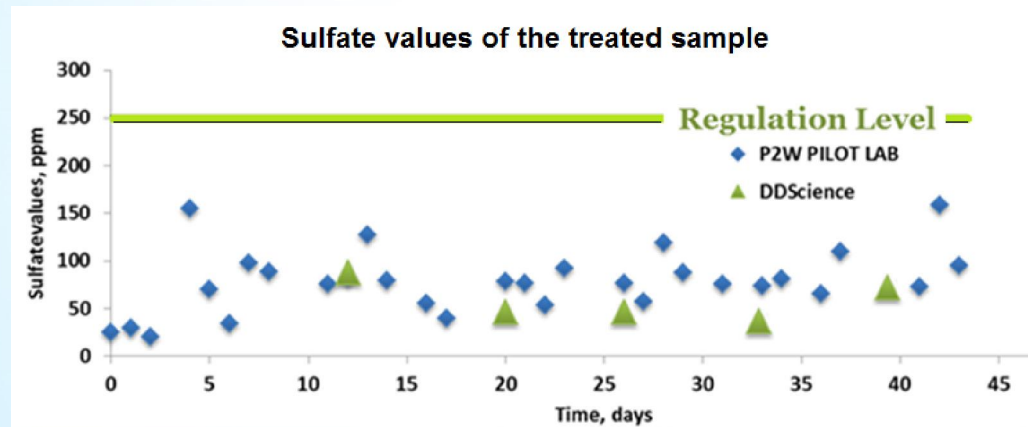
The Problem

- One of the more common contaminants present in waste water from mining activities are sulfates (SO_4)
- The discharge of sulfate enriched water into the environment can have a significantly negative effect on the natural flora and poses substantial risks to the arability of soils, which can severely restrict agricultural activities
- The exposure of the pyrites ($\text{FeS}_2(\text{s})$) to water, oxygen and mechanical activities, lead to the **AMD (Acid Mine Drainage)** phenomena. The AMD are characterized by extremely low pH , high levels of iron, sulfates and heavy metals



Sulphate Removal

Results from the Pilot at Randfontein, 2013



Business Model

CAPEX and OPEX

P2W design, construct and commission – CAPEX

P2W operation and maintenance – OPEX



AGA's Obuasi Gold Mine in Ghana

The Challenge

- To supply a system with the capacity to treat 250 m³/h of wastewater affected by mine activity, on a 24/7 basis.
- The mine required an immediate solution.

Major Contaminates:

- Heavy Metals.
- Arsenic.
- Conductivity.

**Commissioned 2012
24/7 Operation**



AGA's Obuasi Gold Mine in Ghana

The Challenge

- To supply a system with the capacity to treat 500 m³/h of wastewater affected by mine activity, on a 24/7 basis.

Major Contaminates:

- Cyanide.
- High level of SCN to be treated down to 2ppm.
- Heavy Metals.
- Arsenic.
- Conductivity.

**Commissioned August 2014
24/7 Operation**



GoldenStar Bogoso Ghana

The Challenge

- To supply 2 identical systems with the capacity to treat 275 m³/h each of wastewater affected by mine activity, on a 24/7 basis.

Major Contaminates:

- Cyanide
- High level of SCN
- Conductivity
- Heavy Metal
- Sulfate
- High COD

**Commissioned 2012
24/7 Operation**



P2W Patents



Heavy Metals Removal



Cyanide Destruction



Sulfate Treatment



Conductivity Reduction



Slurry Treatment process

Patent Publication #	Patent Title	Granted	
Publ. #: WO2009/133550	INTEGRATED ELECTROLYTIC AND CHEMICAL METHOD FOR PRODUCING CLEAN TREATED WATER WHEREIN CYANIDE SPECIES CONCENTRATION IS LESS THAN 1 MILLIGRAM PER LITER	GRANTED in South Africa	In process in Africa, Brazil and USA
Publ. #: WO2009/133550	SYSTEM FOR ELECTROCOAGULATIVELY REMOVING CONTAMINANTS FROM CONTAMINATED WATER		In process in Europe and USA



Thank you!
"Medassi"