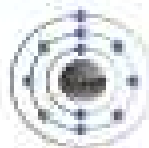


GROUNDWATER DESALINATION

Austin, Texas - Sept 2015

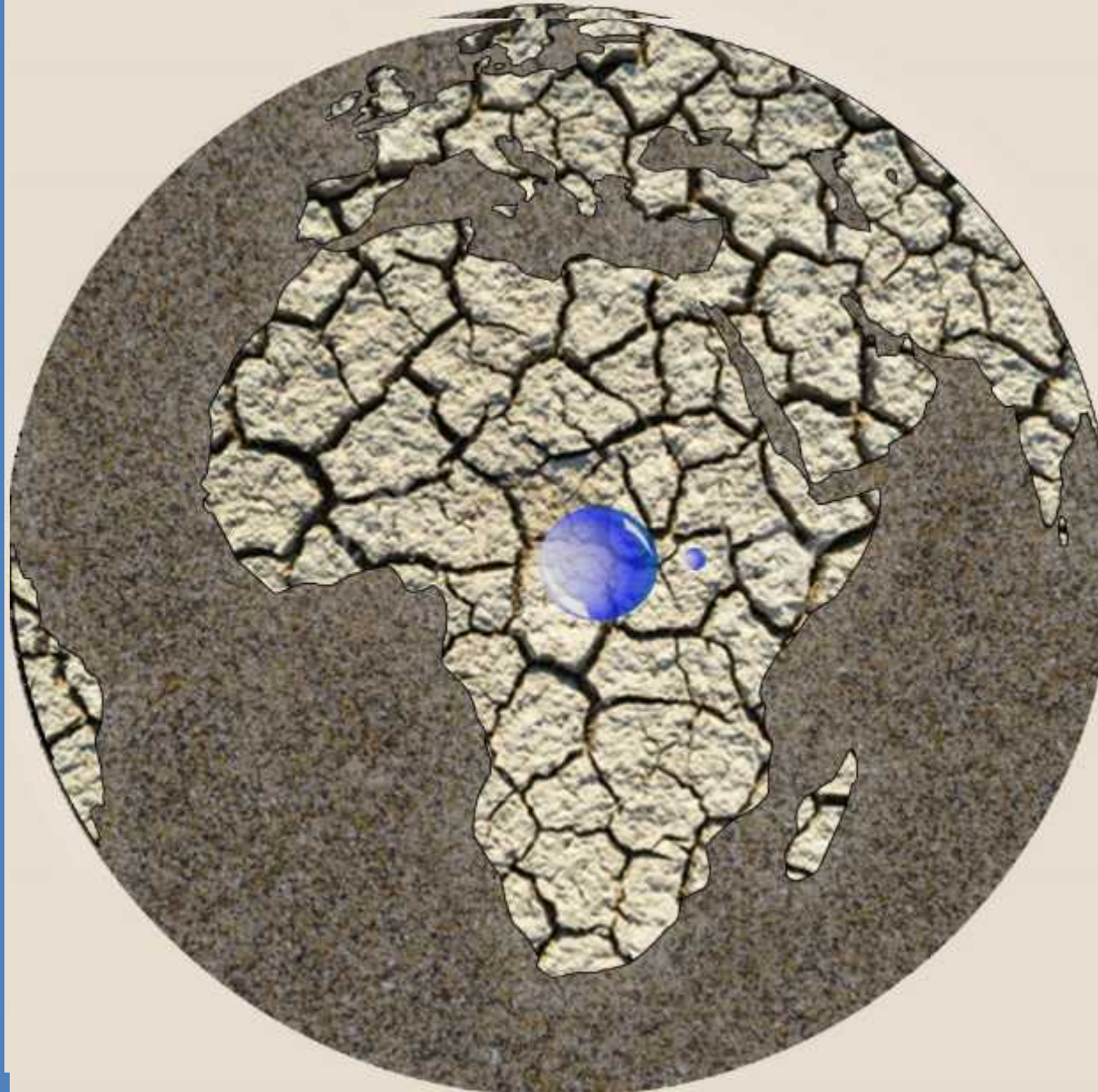
presented by
John Bewsey
Pr Eng, Pr Sci Nat, CE, C Sci.



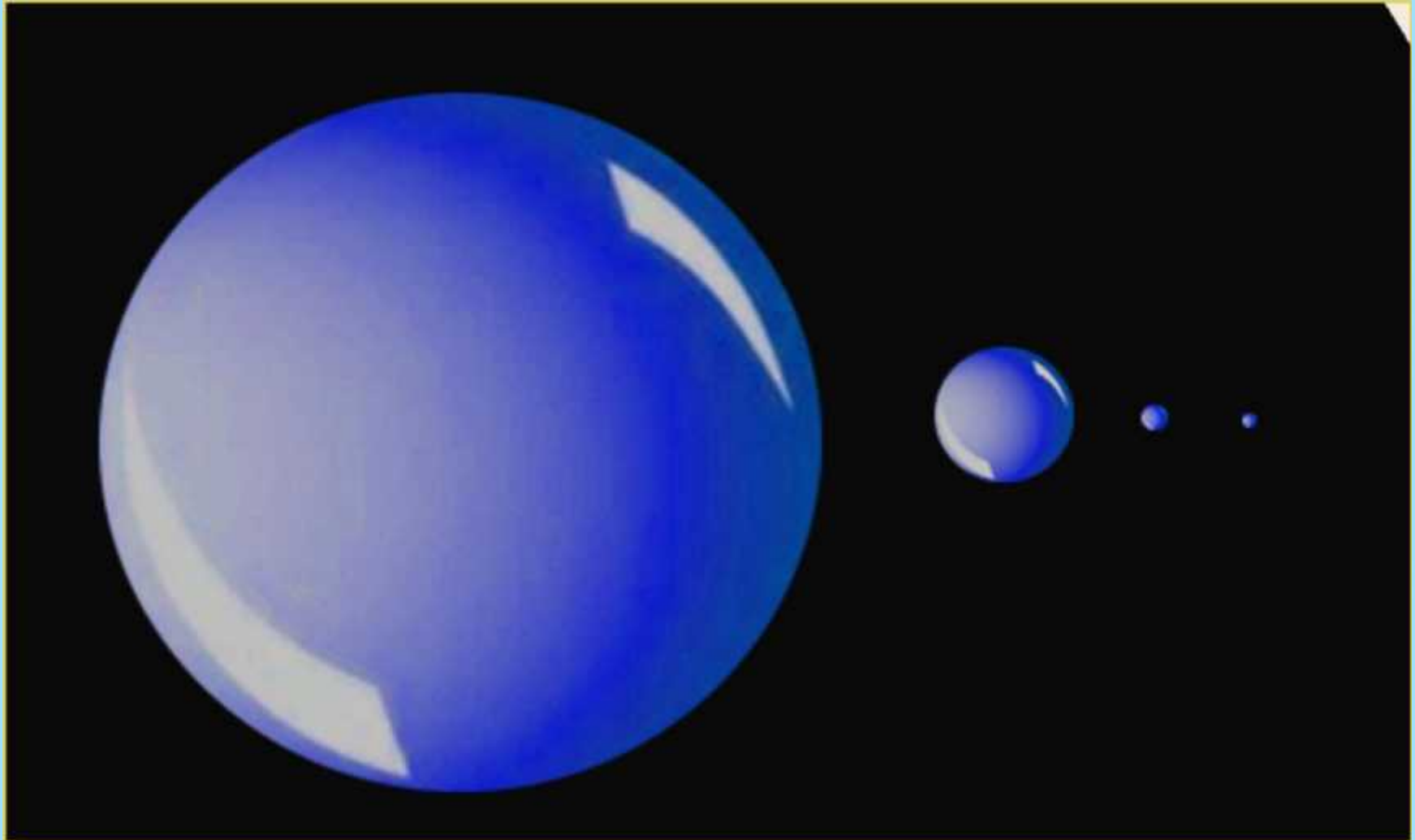
MAFES
MINING & MINING OPTIMIZATION SOLUTIONS



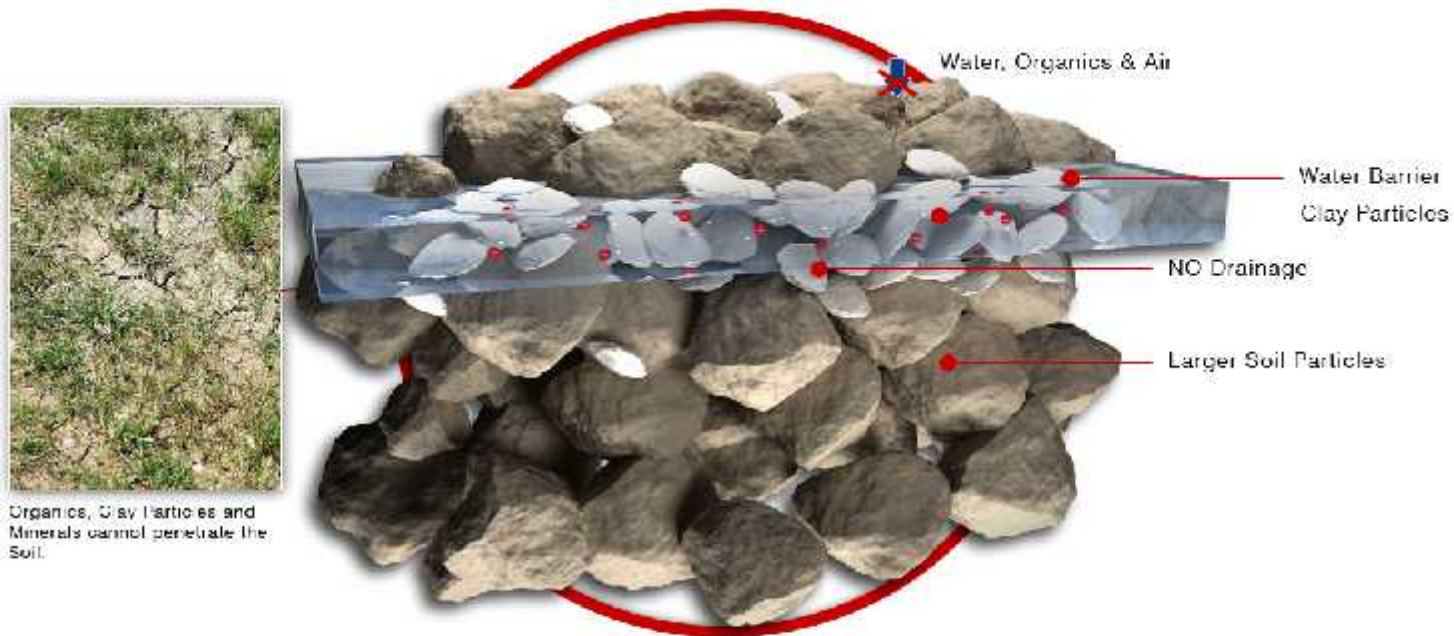
EARTH'S WATER RESOURCES



SOIL and WATER RESOURCES



The effect of sodium on clay particles in the soil



The Physical Structure of Soil

Sodium modifies the Soil structure by acting as a flocculant for Clay Particles which becomes an **Impermeable layer** stopping water, air and nutrient flow to the root zone



A Simple Solution

KNe[®]

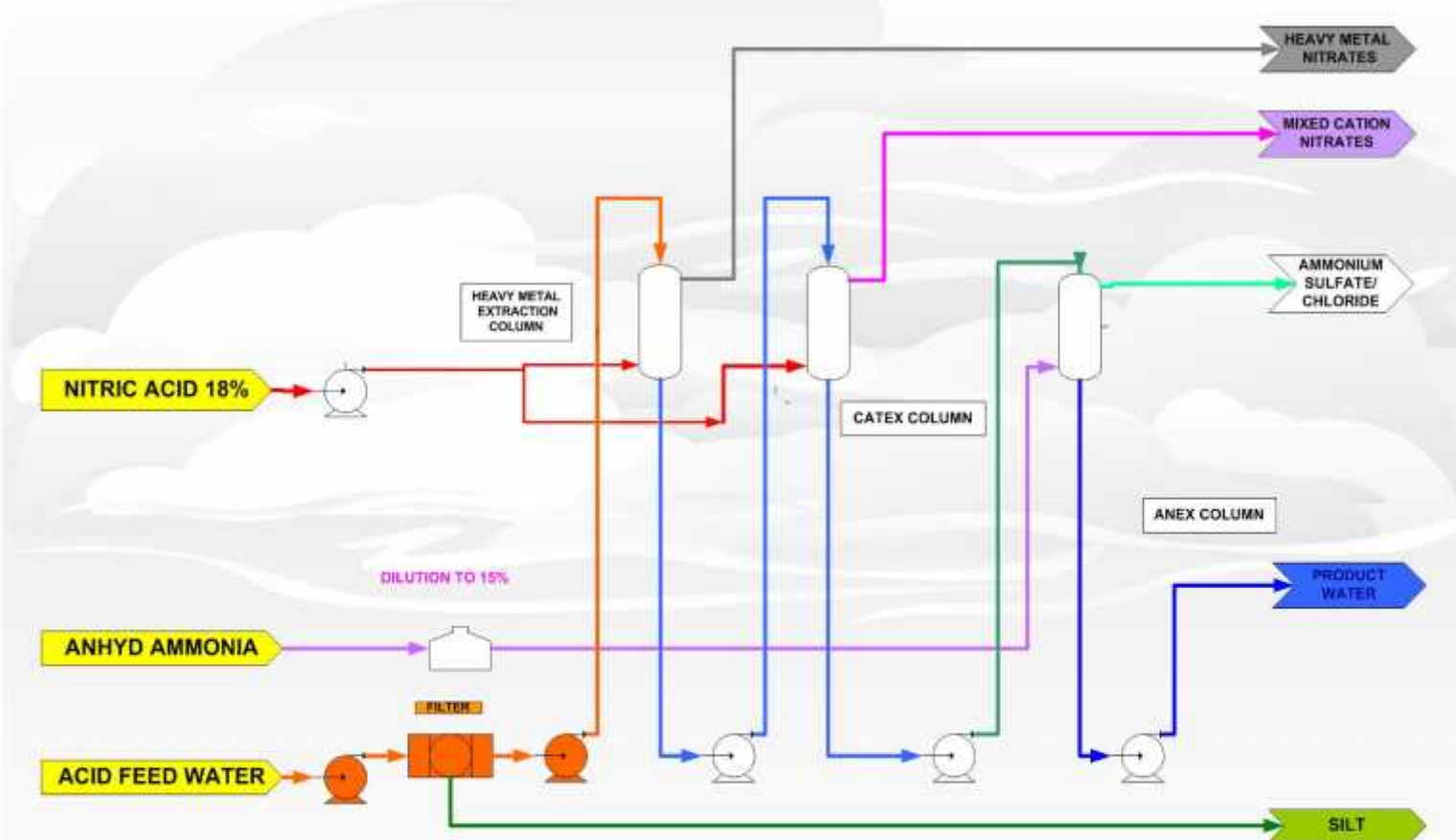
PROCESS

Potassium Nitrate ex-Waste
International Patent (WO 2012-042483)

Solves SODIUM, SULPHATE & CHLORIDE issues
Removes RADIO-ACTIVITY usefully.
Low Energy Requirement
Low Heavy Metal / Waste Dumping

Produces Valuable & Commercially Pure Products
POTASSIUM NITRATE, AMMONIUM SULPHATE, DOLOMITE, SODIUM CHLORIDE.





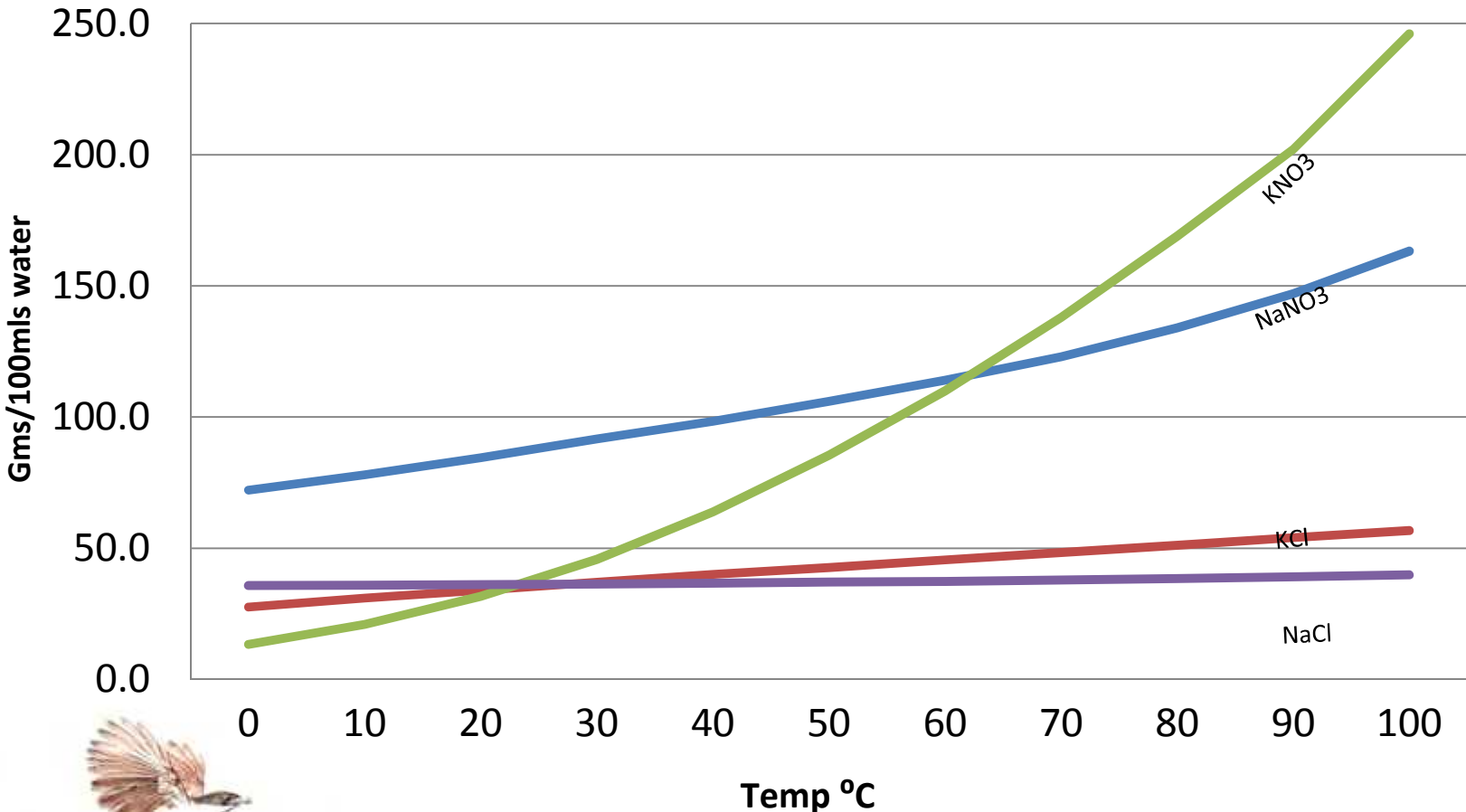
AMD IONEX FLOW DIAGRAM

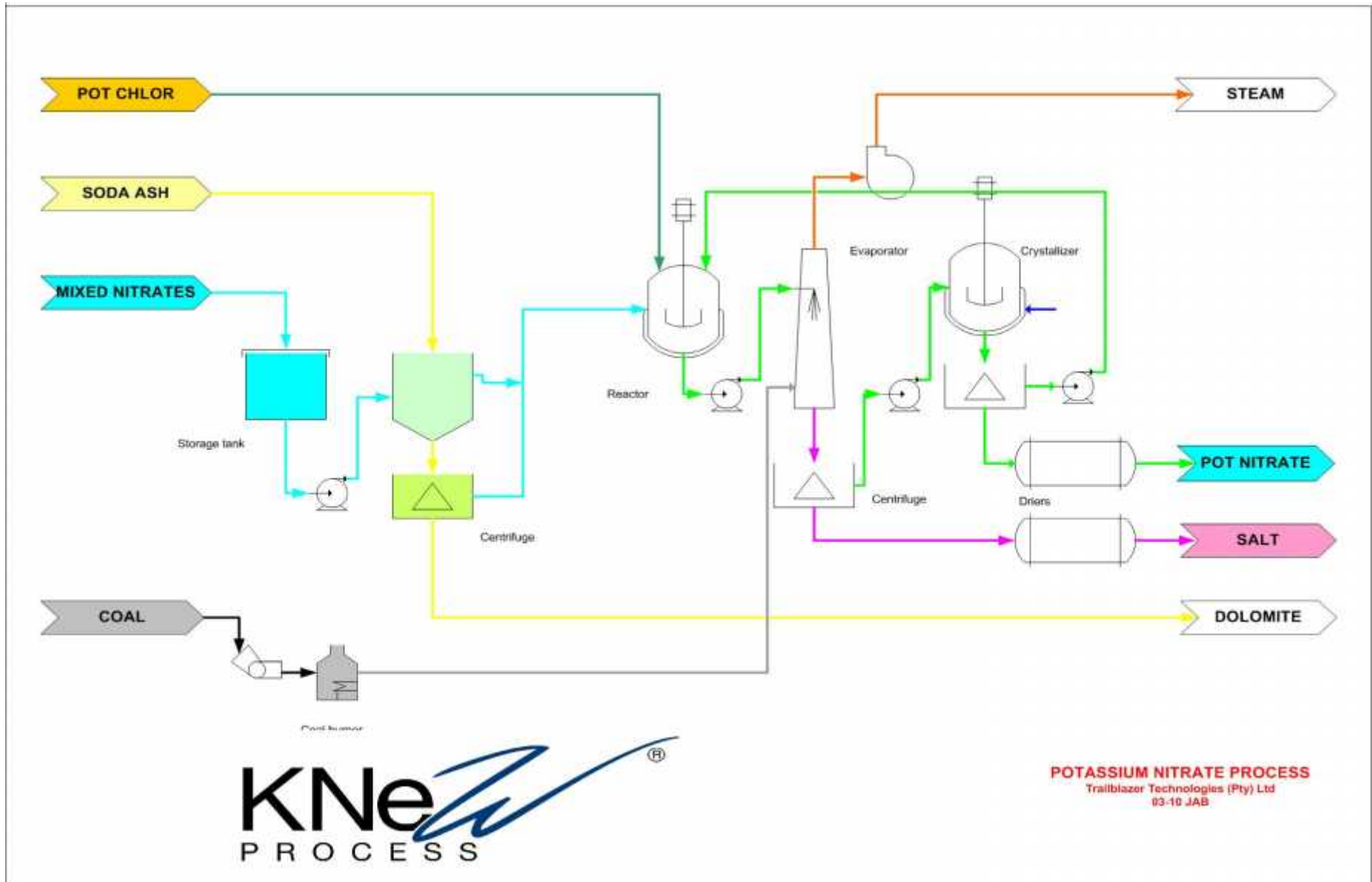
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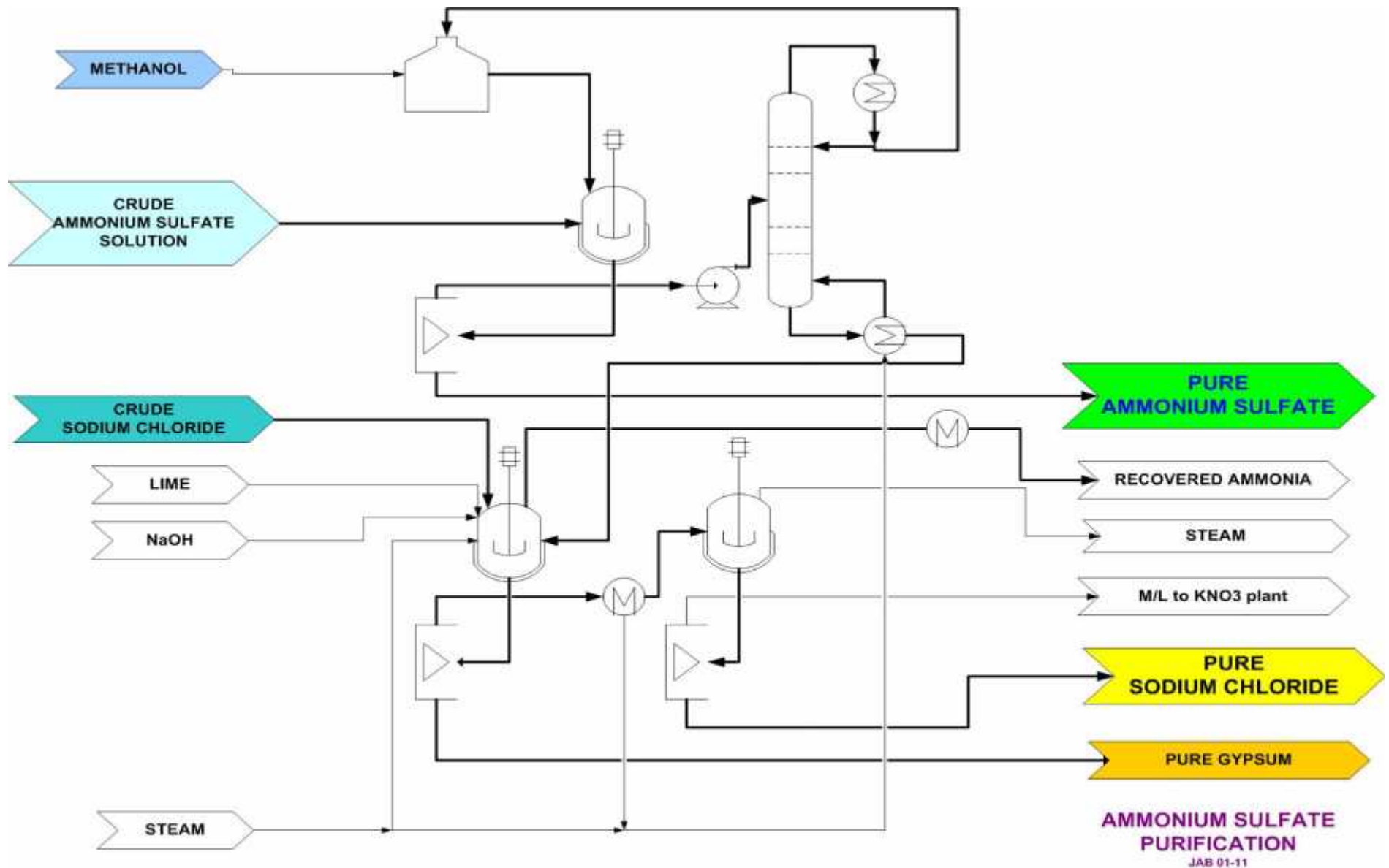


ACID MINE DRAINAGE
CRISIS? OR PART OF AN EVEN BIGGER ISSUE?

Solubilities







**AMMONIUM SULFATE
PURIFICATION**

JAB 01-11

KNe[®]
PROCESS

pilot plant



The KNeW process can assist RO

- The KNeW process can co-process with RO if installed upfront reducing the RO feed concentration by 90% with the RO brine sent back to the KNeW feed
- = **NO WASTE BRINE**
- This will substantially **reduce the power usage** and RO cost
- It will **improve the flow** through existing RO units due to the removal of calcium fouling and the 90% reduction in feed TDS
- The **removal of calcium fouling** of RO membranes will give longer life and much lower maintenance costs

Advantages of the KNeW process

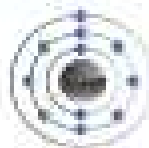
- No brine production
- No waste gypsum sludge production
- Zero cost of irrigation water produced
- USA's only local manufacture of Pot Nit
– saving foreign exchange
- All raw materials locally sourced
- Quality jobs will be created



GROUNDWATER DESALINATION

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MAFES
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