

**A Technology & Engineering Company for Tailing Waste Phosphate, FSA and Gelatin**

**Reach us**

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# INTRODUCTION

- ✓ **CalPhos (Dr.Phosphates)** is started by **Dr. S. Suresh Babuji, ME.(Chem),Ph.D.** in India and Dr. S. Suresh Babuji is expertise in Phosphate (Phosphoric Acid, DCP, MCP etc.,) and Gelatin Industries for more than 2 decades.
- ✓ **CalPhos (Dr.Phosphates)** is specially Developed a Process for **Tailing Waste** Rock Phosphate minimum 10% - 20 %  $P_2O_5$  (Low Grade Rock Phosphate) with **Spent Sulphuric Acid (min 25%-88%Purity)** / Virgin Sulphuric and HCl.
- ✓ **CalPhos (Dr.Phosphates)** is specially Developed a Process for **FSA** Waste (Fluro Silicic Acid) by using **SEA WATER**

## **Tailing Waste Rock Phosphate**

There are lot of Tailing Waste Rock Phosphate (TWRP) is being generated in Rock Phosphate Mine during Beneficiation process to obtain 32%  $P_2O_5$  Rock Phosphate. These generated TWRP are being deposited as a waste in mine itself for more than 5-8 decades.

**CalPhos (Dr.Phosphates)** has developed a process to use these waste rock phosphate and produce Phosphatic Products.

### **Tailing Waste Rock Phosphate- TWRP**

1. It Contains  $P_2O_5$ -15-22% ; CaO : 37%, Feral : 5-6.5%,  $SiO_2$  – 20-25% and other impurities
2. TWRP is very fine powder and its about 5-30 micron size.
3. TWRP is easily digestible by Sulphuric Acid (even spent Sulphuric Acid 25% Conc) and HCl

## **Expertise of CalPhos (Dr.Phosphates)**

CalPhos is an expertise to providing the following Service

1. Technology Supply
2. Engineering Services
3. Technical Services for improving process yield in Running Plant  
(Phosphate and Gelatin Industries)
4. Rock Phosphate Evaluation (Lab & Bench Scale Tests)
5. Testing of Elements, Heavy metals and Rare Elements
6. Project Feasibility Study

## **Our Clients**

CalPhos has applied its Technology on Tailing Reject Rock Phosphate to

1. Industries Chimiques Du Senegal - ICS, West Africa
2. Centrex Limited , Australia
3. Rajasthan State Mines and Minerals- RSMM, India

# TECHNOLOGIES

## Beneficiated Rock Phosphate (32% P<sub>2</sub>O<sub>5</sub>)

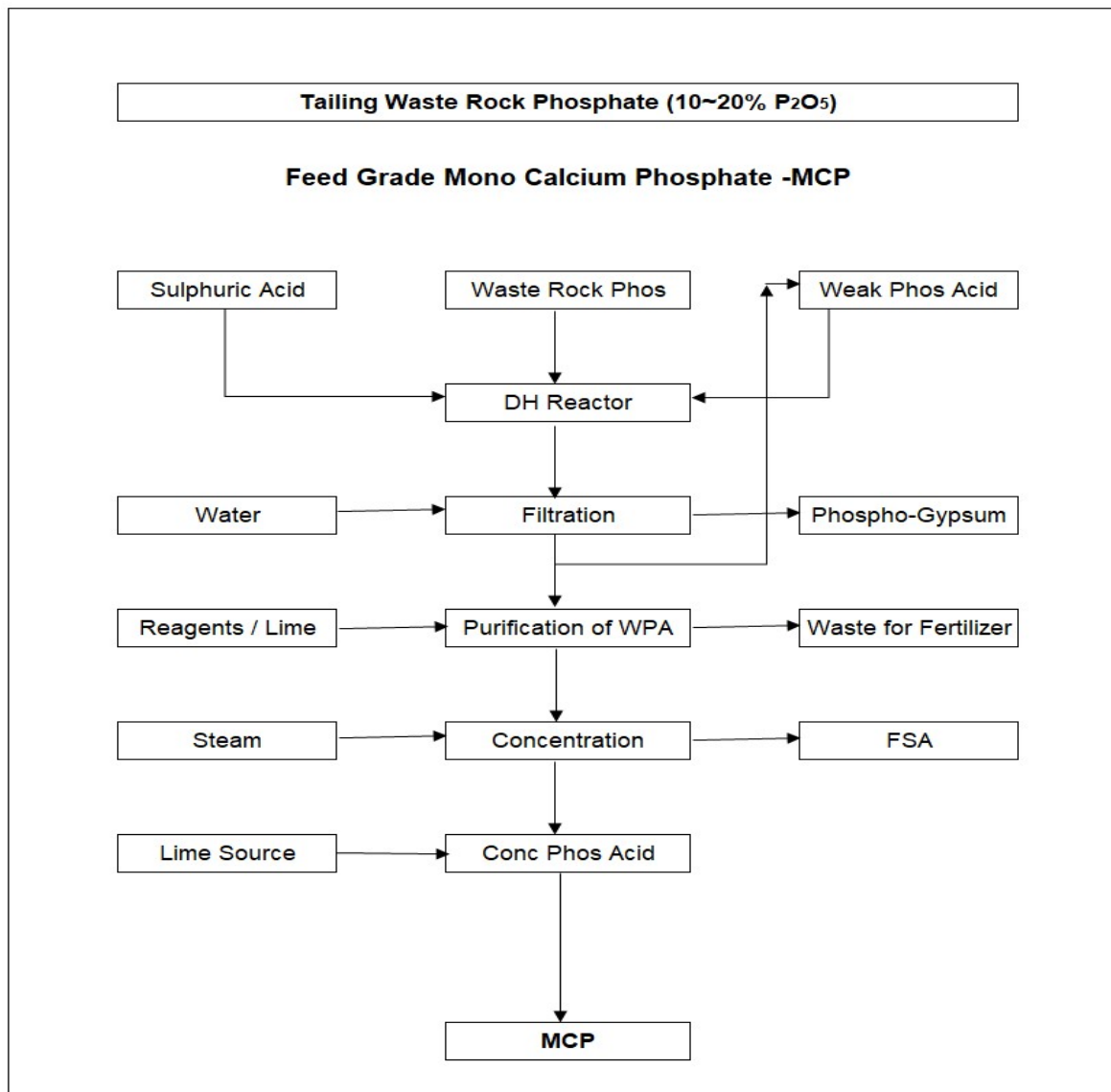
- Mono-Calcium Phosphate
- Di-Calcium Phosphate
- Tri-Calcium Phosphate
- Purified Phosphoric Acid
- Marchant Grade Phosphoric Acid

## Tailing Waste Rock Phosphate (10-20% P<sub>2</sub>O<sub>5</sub>)

- Mono-Calcium Phosphate
- Di-Calcium Phosphate
- Tri-Calcium Phosphate
- 35% P<sub>2</sub>O<sub>5</sub> Phosphoric Acid for NPK
- Technical Grade Phosphoric Acid

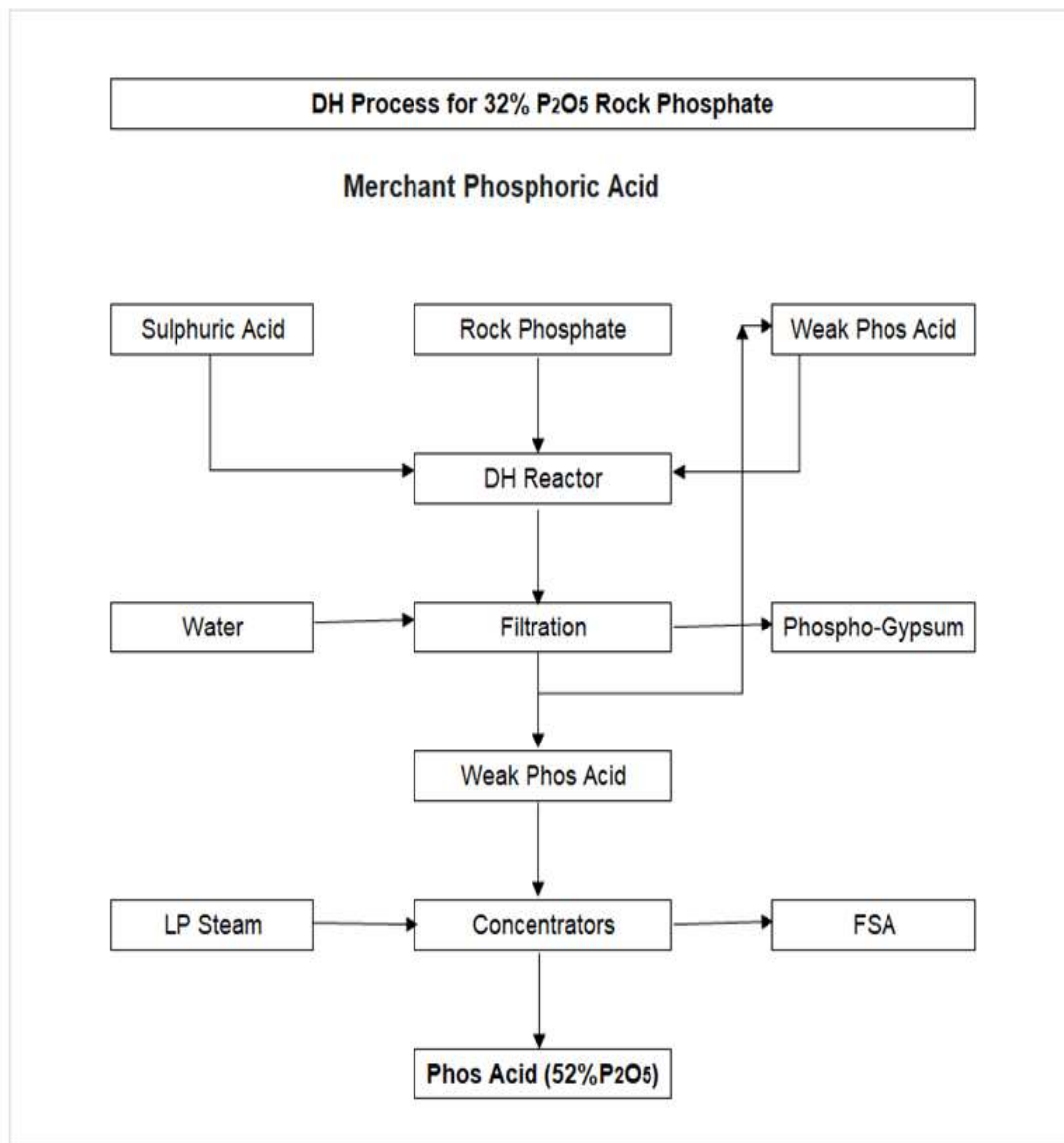
## Fluro Silicic Acid

- Di-Calcium Phosphate
- Sodium Silico Fluoride
- Calcium Silico Fluoride



## Process:

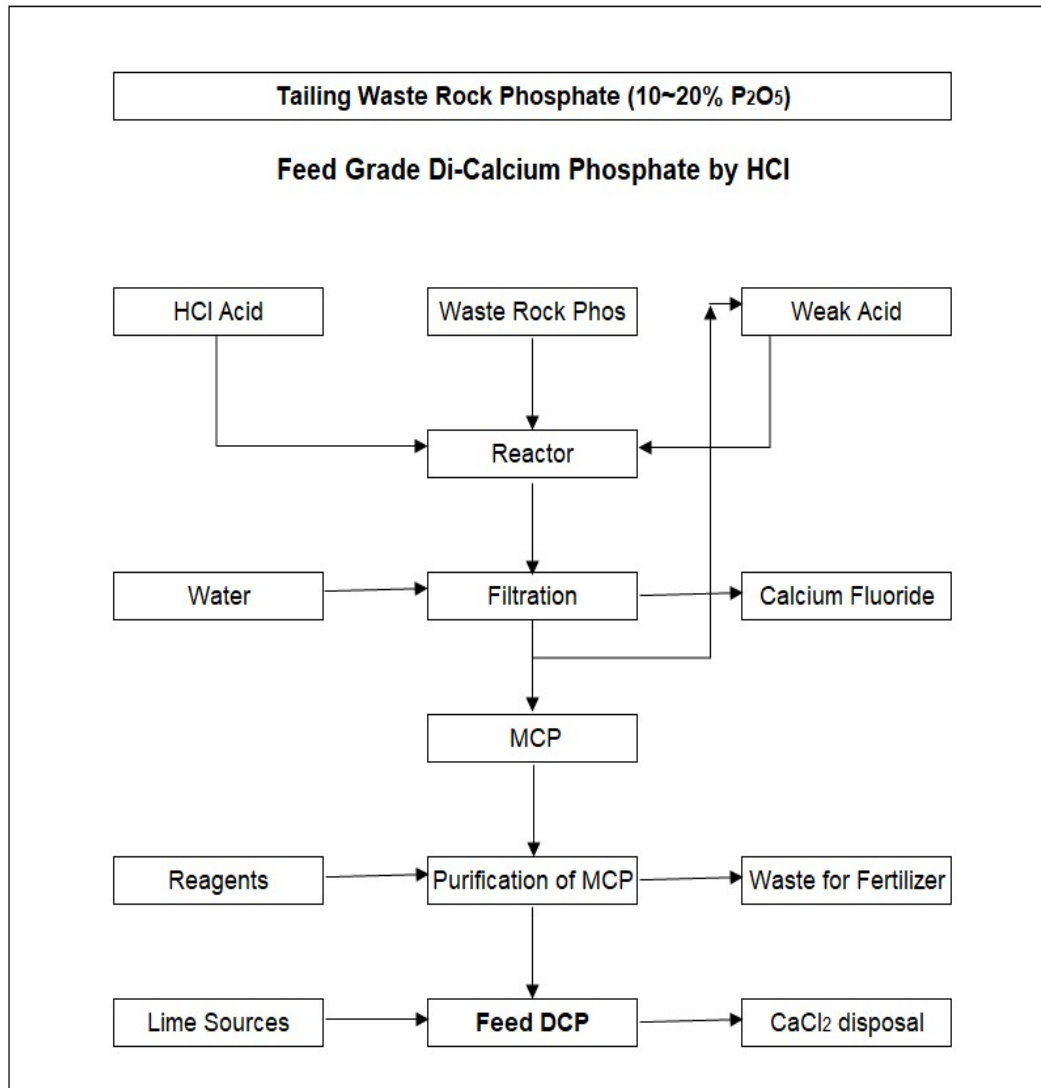
- The Tailing Waste is digested with Sulphuric Acid (Virgin or Spent Acid) to produce Weak Phosphoric Acid
- WPA is further purified and concentrated up to 45%  $P_2O_5$
- Concentrated  $P_2O_5$  is added with Lime source to produce Mono-Calcium Phosphate.
- In this process FSA is by product which can be used for DCP, SSF production.



## Process:

- This is conventional process where the Con Sulphuric Acid is reacted with RP by DH Process.
- WPA is further purified and concentrated up to 52% P<sub>2</sub>O<sub>5</sub>
- In this process FSA is by product which can be used for DCP, SSF production.





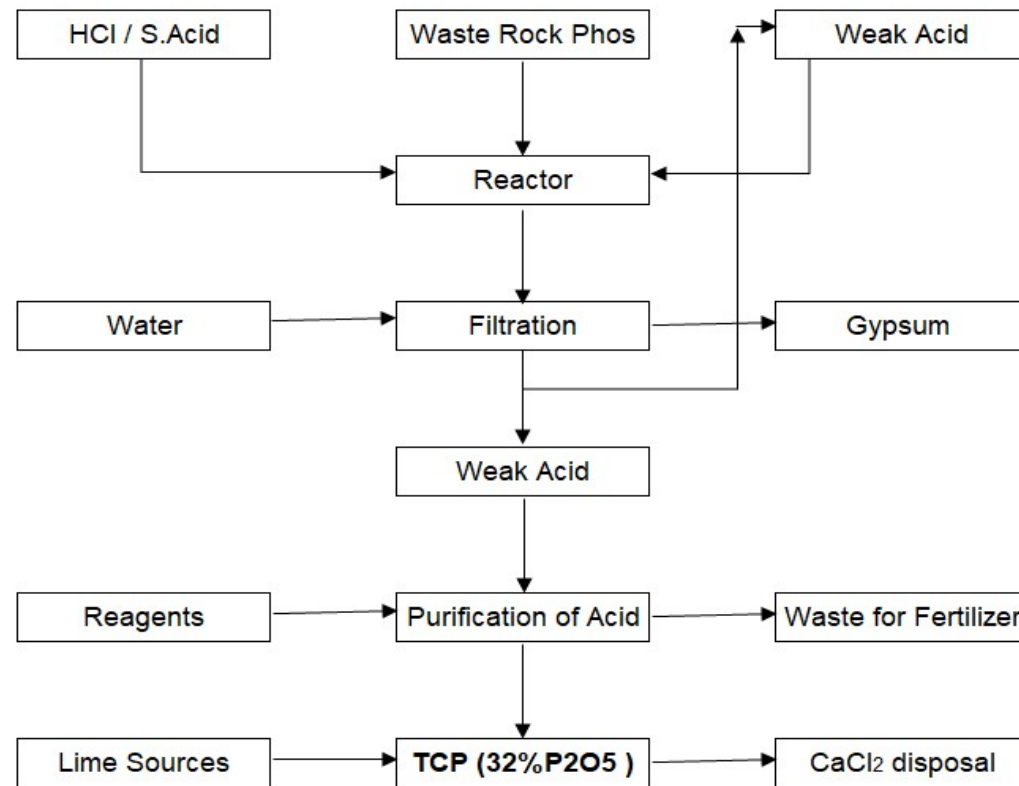
### Process:

33% HCl is the by product of Chloro Alkalis Plant and these acid is sold at low cost and even its being disposed as waste

- The Tailing Waste is digested with HCl and its separated from waste.
- WPA is further purified and concentrated up to 45%  $P_2O_5$
- Concentrated  $P_2O_5$  is added with Lime source to produce Mono-Calcium Phosphate.
- In this process FSA is by product which can be used for DCP, SSF production.
- Note: Spent / Virgin Sulphuric Acid are alternatively used

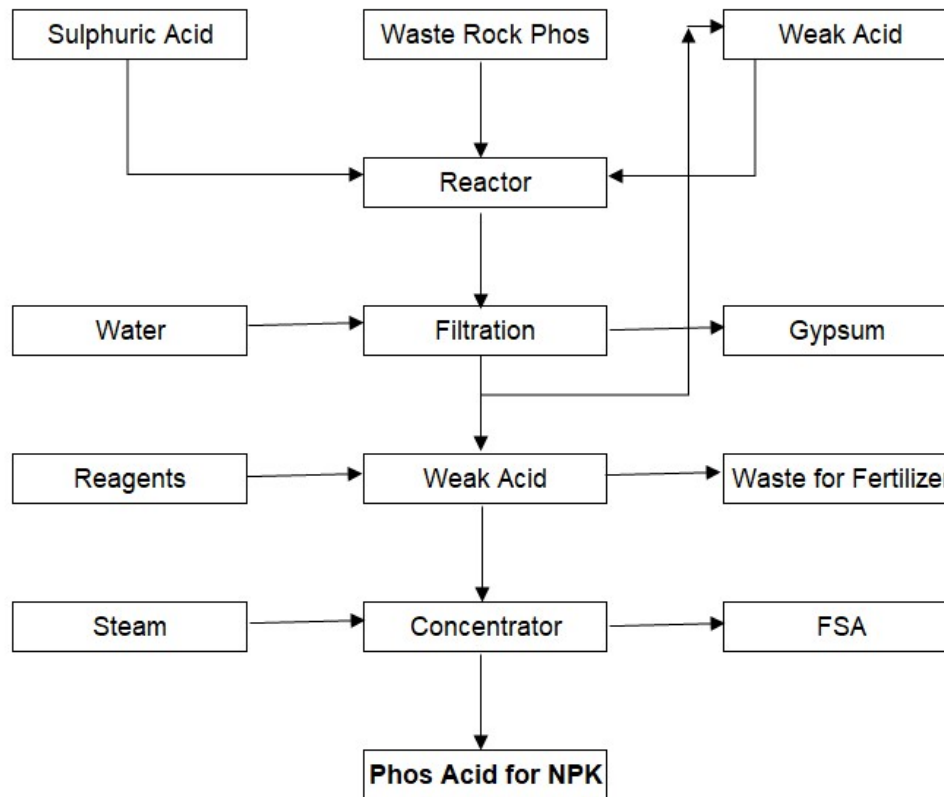
**Tailing Waste Rock Phosphate (10~20%  $P_2O_5$ )**

### **Tri Calcium Phosphate**



**Tailing Waste Rock Phosphate (10~20%  $P_2O_5$ )**

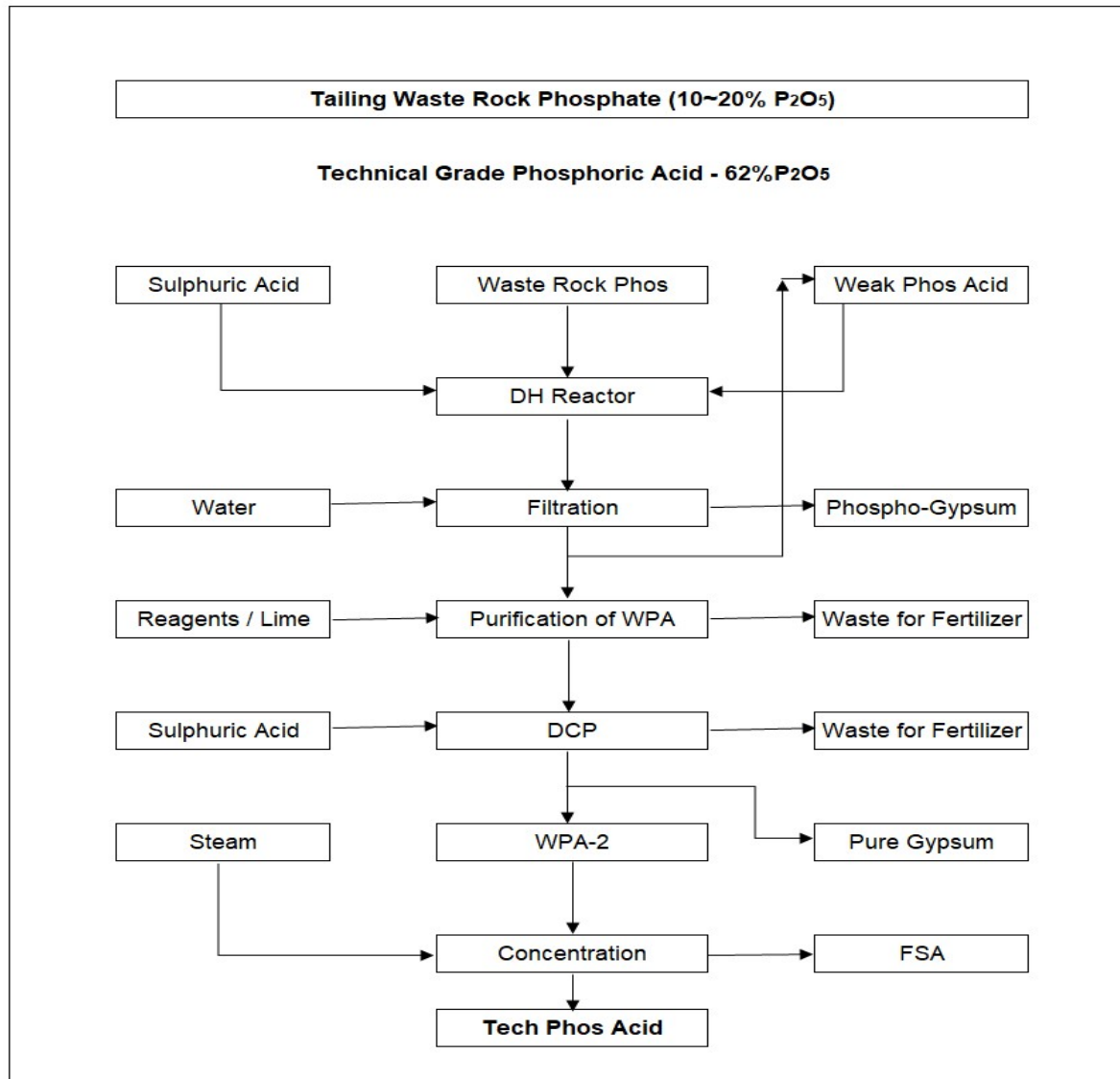
**Phosphoric Acid (35% $P_2O_5$ ) for NPK**



## Process:

Concentrated  $P_2O_5$  is diluted to produce NPK fertilizer. However, CalPhos can be produced Weak Phosphoric Acid for replacing .

- The Tailing Waste is digested with Sulphuric Acid (Virgin or Spent Acid) to produce Weak Phosphoric Acid
- WPA is further purified and concentrated up to 35%  $P_2O_5$  for NPK production.

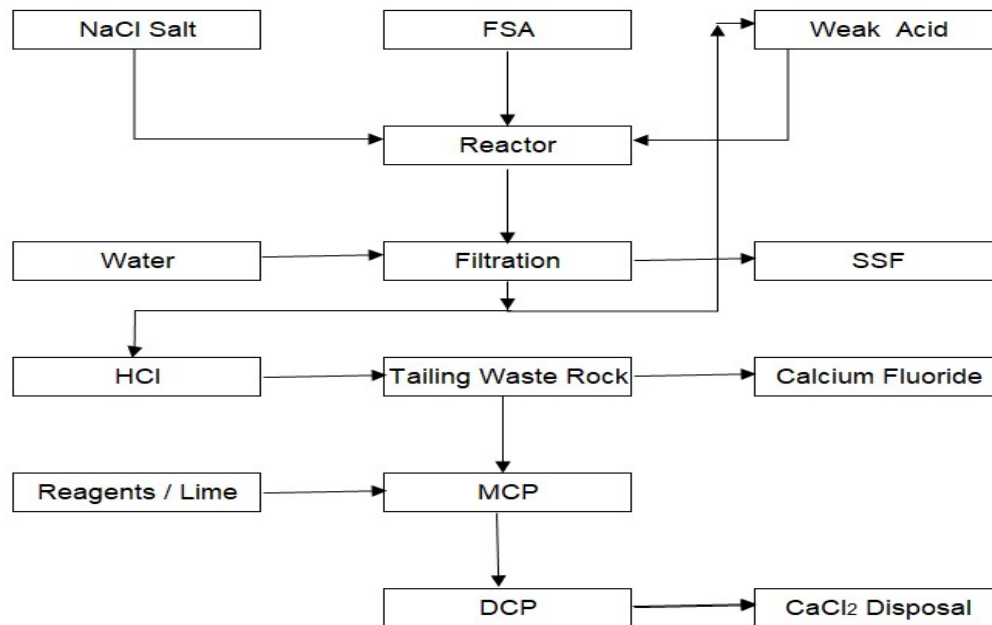


## Process:

- The Tailing Waste is digested with Sulphuric Acid (Virgin or Spent Acid) to produce Weak Phosphoric Acid
- Then its purified and produced DCP. The produced DCP is further converted into Phosphoric Acid.
- The purified Phos Acid is further concentrated to achieve 62%  $P_2O_5$

**Tailing Waste Rock Phosphate (10~20% P<sub>2</sub>O<sub>5</sub>) & FSA Recovery**

**Feed Grade Di-Calcium Phosphate & Sodium Silico Fluoride**

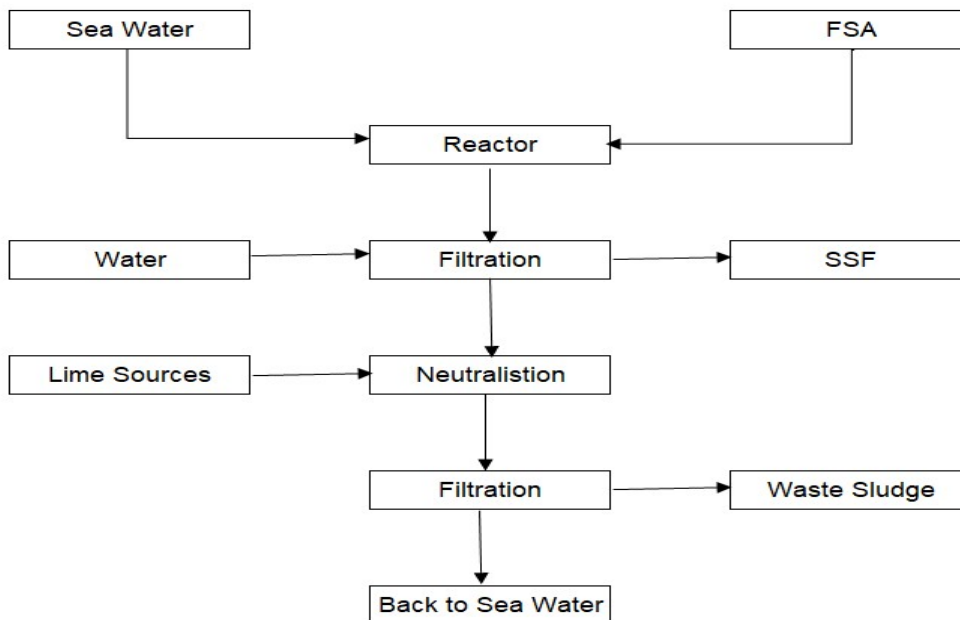


**Process:**

- FSA is reacted with Sodium Source to produce SSF and HCl is generated as by product.
- The generated HCl is further digested with Tailing Waste to produce MCP and DCP further.
- This process generated dilute CaCl<sub>2</sub> at the range of 2-3%.

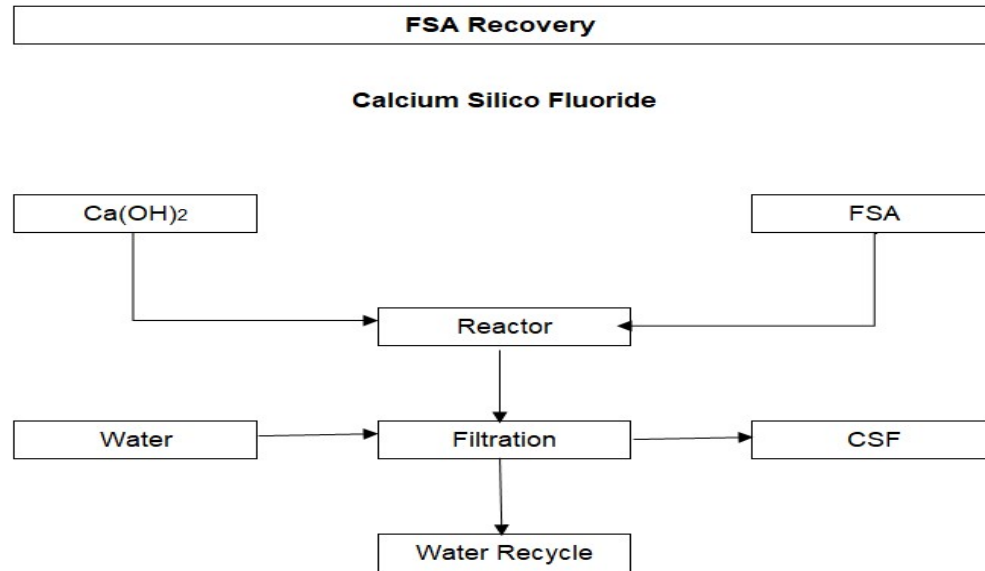
## FSA Recovery by SEA WATER

### Sodium Silico Fluoride



### Process:

- FSA is reacted with Sodium Source to produce SSF.
- The generated HCl is further digested with Tailing Waste to produce MCP and DCP further.
- This process generated dilute  $\text{CaCl}_2$  at the range of 2-3%.



### Process:

- FSA is reacted with Calcium Source to neutralize
- This is expensive process and it is optional only

**THANK YOU**

**M/s. CALPHOS(DR.PHOSPHATES) INDIA**

**DR.S.SURESH BABUJI,M.E,Ph.D**

**FOUNDER**