Central Pollution Control Board

(Ministry of Environment & Forests)

Delhi

PILOT WATER TREATMENT PLANT
BASED ON SRP TECHNOLOGY
AT
BHARIRATHI WATER TREATMENT PLANT(DJB)
YAMUNA VIHAR ,DELHI

0.5MLD PILOT WATER TREATMENT PLANT BASED ON SRP TECHNOLOGY

The Central Pollution Control Board (CPCB) is a statutory organization under the aegis of Ministry of Environment & Forests (MoEF), Govt. of India.

The Central Pollution Control Board serves as an apex organization in the country, as technical wing of MoEF and provides technical assistance to the State Pollution Control Boards, Pollution Control Committees for implementation of the provisions of various pollution control legislations in the country.

CPCB laboratories play an important role in assessing the status of environment comprising analysis of water, air and soil analysis and analysis of biotic components.

CPCB laboratories are also involved in various R&D projects related to pollution control activities and obtained eight patents on pollution control technology.

"Treatment of Water and Wastewater using Sludge-Reagent-Product (SRP) Technology" is one of the patented eco-friendly zero discharged treatment technology project of CPCB.

BACK GROUND AND SUMMERY

The Central Pollution Control Board (CPCB) in collaboration with Dr. S. K. Biswas (Investigator of SRP Technology) has conducted a R&D Project entitled **"Treatment of Water and Wastewater using Sludge-Reagent-Product (SRP) Technology"** to tackle the problem of huge amount of sludge generated from the water works which use alum for precipitation of colloidal particles by coagulation and flocculation process.

While dealing with the sludge problem, CPCB came with an innovative idea of regenerating and recycling the alum along with positive charged colloidal particle in water treatment process.

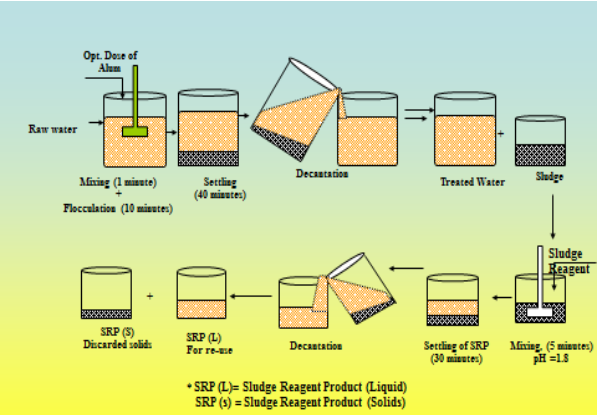


FIGURE-: PROCESS FLOW SHEET FOR PREPARATION OF SLUDGE REAGENT PRODUCT (SRP)

SRP(SLUDGE-REAGENT-PRODUCT) PREPARATION PROCESS IN THE LABORATORY

LABORATORY SCALE WORKING MODEL OF SRP BASED TREATMENT TECHNOLOGY

As this innovated technology is concerned with drinking water supply, a number of laboratory experimental works had been performed for four years i.e. during 1998 – 2001, by CPCB,

The basic research of Dr. S. K. Biswas i.e. recycling of alum and colloidal particle was further renovated by CPCB i.e. batch process to continuous recycle process by which this technology can be used commercially in water treatment plant.

For this purpose, a laboratory scale working model was set-up in CPCB for conducting treatability studies with SRP Technology.

This treatment technology entitled "**An Integrated Plant for Treatment of Raw Water Using Discarded Sludges to Produce Drinking Water"** has been patented vide Indian Patent No. 215808 (Filed in April 2001 and Granted **in March 2008.**

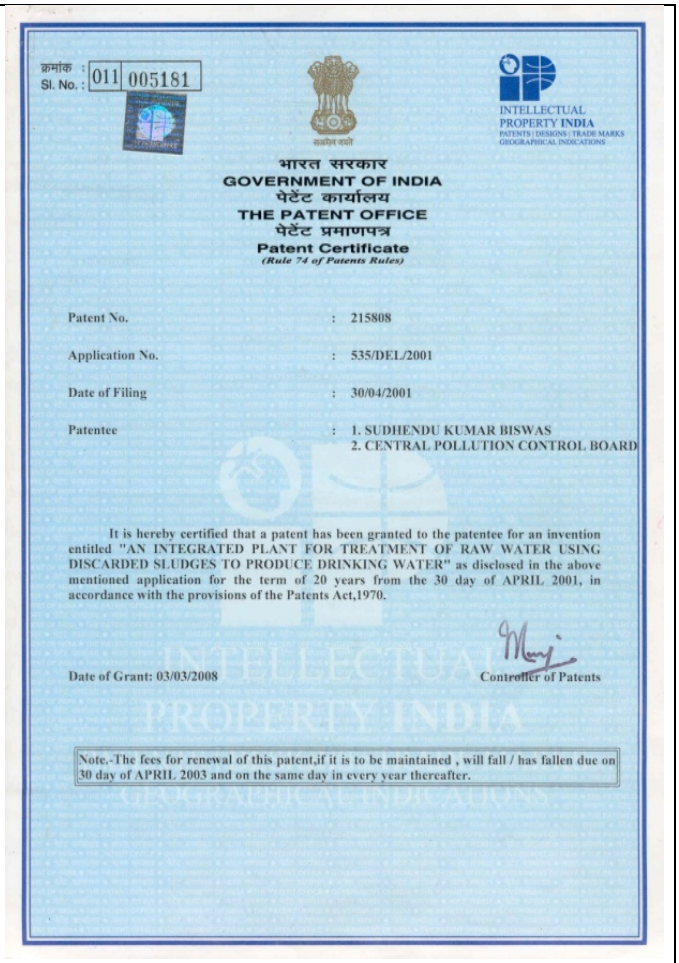
Based on the above ground work the MoU was executed between CPCB and DJB for Construction and Operation 0.5 MLD Pilot Water Treatment Plant based on SRP technology at Bhagirathi Water Treatment Plant, Gokulpuri, Yamuna Vihar Delhi.

This Pilot Project is fully funded by Central Pollution Control Board.

The construction and successful trial-operation of Pilot Plant has been completed by M/s Hydrotech, Delhi (Contractor of Pilot Plant)with technical consultation of CPCB & DJB.

The drinking water quality of SRP-Technology based Pilot-Plant has been tested(Analysis) by Delhi Jal Board and CPCB .

The water quality of Pilot Plant is at par with the water quality, generated from conventional treatment process.



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Sl. No. :

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE
पेटेंट प्रमाणपत्र
Patent Certificate
(Rule 74 of Patents Rules)

Patent No.	:	215808
Application No.	:	535/DEL/2001
Date of Filing	:	30/04/2001
Patentee	:	1. SUDHENDU KUMAR BISWAS 2. CENTRAL POLLUTION CONTROL BOARD

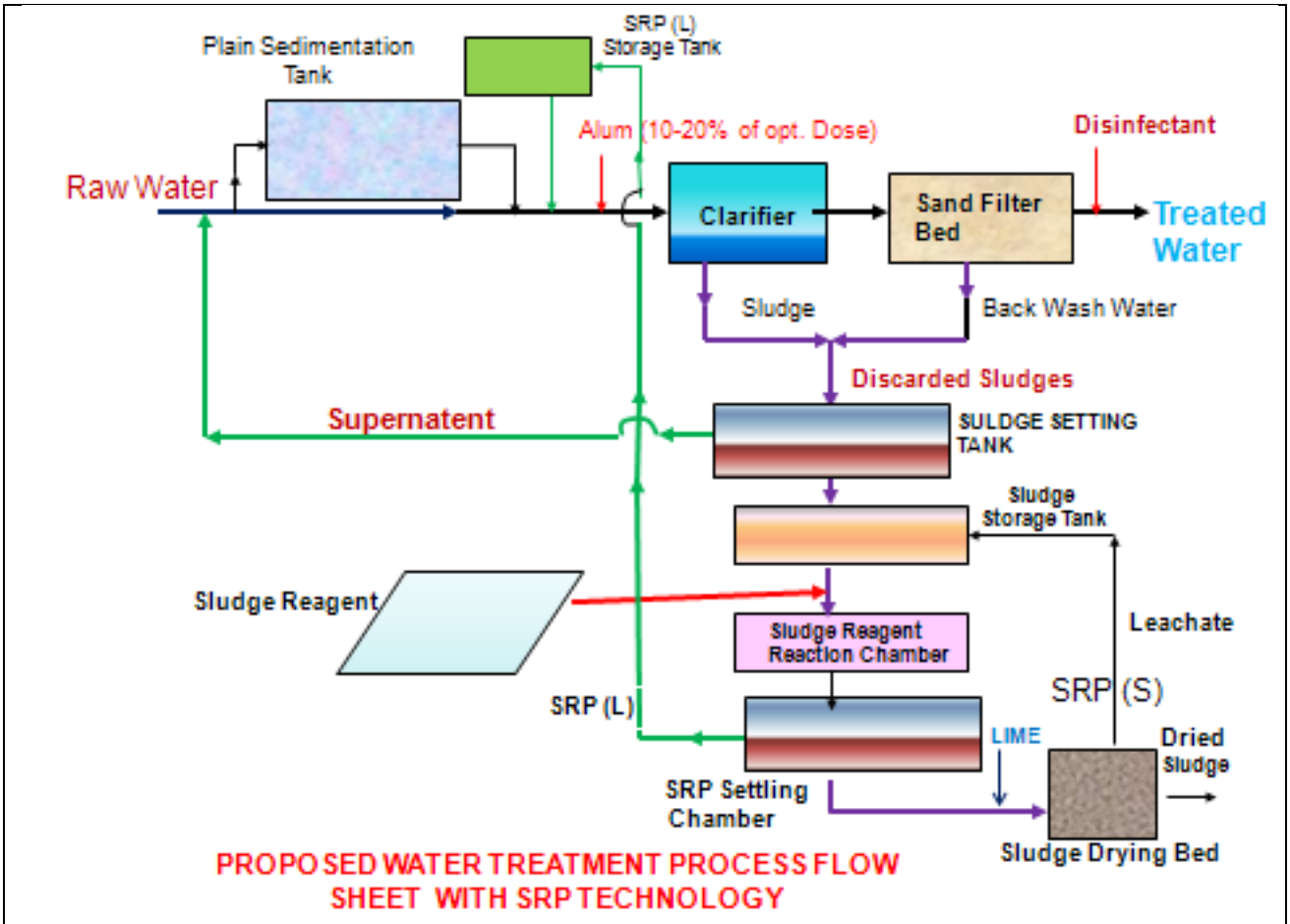
It is hereby certified that a patent has been granted to the patentee for an invention entitled "AN INTEGRATED PLANT FOR TREATMENT OF RAW WATER USING DISCARDED SLUDGES TO PRODUCE DRINKING WATER" as disclosed in the above mentioned application for the term of 20 years from the 30 day of APRIL 2001, in accordance with the provisions of the Patents Act,1970.

Date of Grant: 03/03/2008

Controller of Patents

Note.-The fees for renewal of this patent,if it is to be maintained , will fall / has fallen due on 30 day of APRIL 2003 and on the same day in every year thereafter.

INDIAN PATENT CERTIFICATE ON SRP TEECNOLOGY



SRP-TECHNOLOGY BASED-TREATMENT PROCESS:

(ALUM 10% + SRP 90%)↓

RAW WATER →→→→→→→ FLASH MIXTURE→ →CLARI-FLOCULATION→→

(CHLORINATION) ↓

→→→→SAND FILTRATION →→→→→→ TREATED WATER

Sludge Reagent Product

The discarded sludge obtained from process of coagulation of water treatment system was treated chemically and the product obtained was named as 'Sludge Reagent Product' (SRP) which was used successfully as coagulant in lieu of the fresh alum used in the water work.

SLUDGE COLLECTION TANK OF PILOT PLANT

SRP PRODUCTION PROCESS IN PILOT PLANT

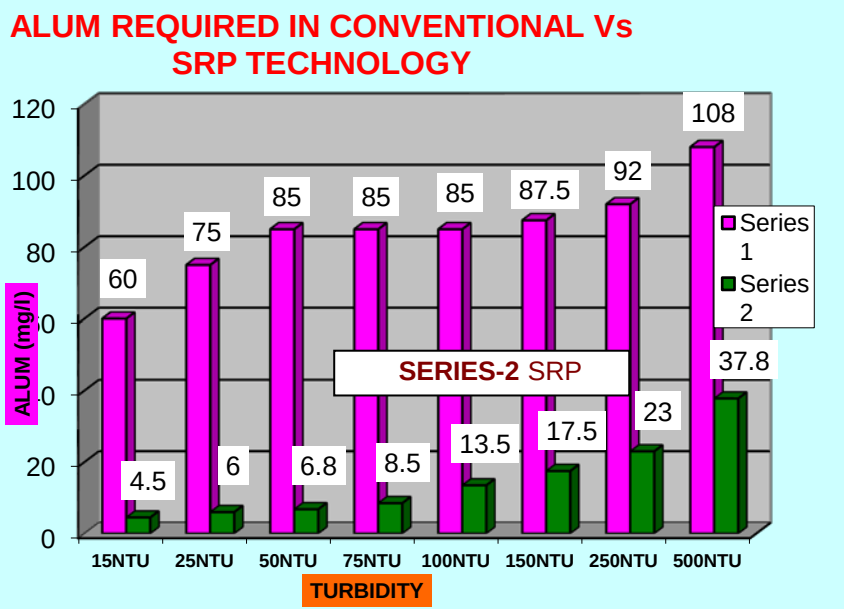
Sludge Reagent Product(SRP) Process :

- Collection of Sludge from Clarifloculator and sand filter Backwash.
- Transferred sludges into the **Sludge–Thickener-Tank** and retained it for 45 Minutes
- Transferred (Recovered) supernatant water in to the Raw water in-take point.
- Transferred thicken sludge into the **Sludge- Storage-Tank.**
- Transferred Fixed Volume of sludge and **SRP- Reagent** into the **SRP-Reaction –Chamber** and mix it for 15 minutes.
- Transferred mixture into the SRP-Settling chambers and settled it for 30 minutes.
- Transferred supernatant **(i.e SRP)** into the **SRP-Storage-Tank** for further used in Water Treatment Process as **RECOVERED ALUM.**
- The settled sludge which is acidic in nature is transferred into the **Lime-Mixing-Tank** followed by **Sludge-Drying-Bed.**

Figure showing requirement of alum in for raw water at different NTU in Conventional Vs SRP technology.

It is observed that fresh alum requirement in SRP technology varied from 7 to 30 % in comparison to Conventional technology.

In other word 93 to 70% of alum requirement is fulfilled by the recovered alum i.e. SRP .



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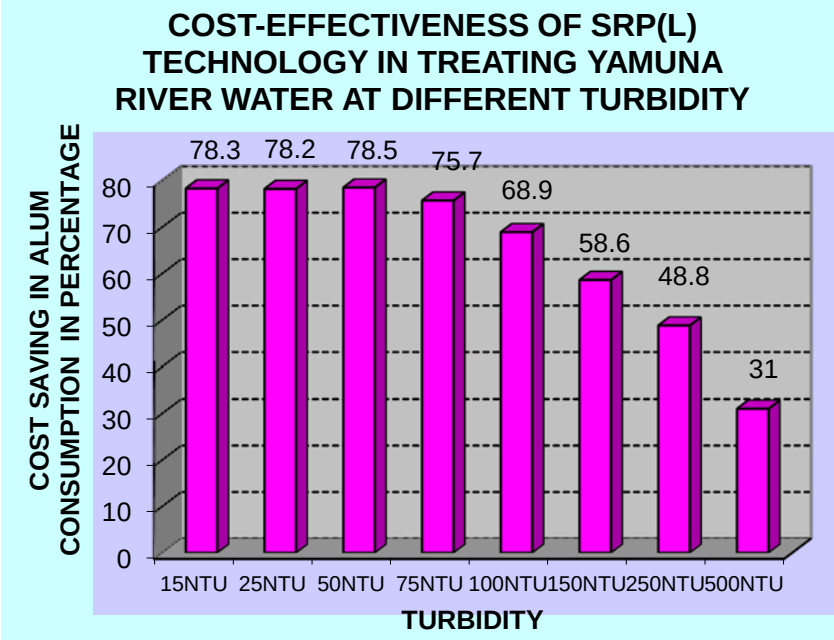

Figure showing cost saving in term of alum consumption in SRP technology.

It is observed that cost of saving ranged from 70 to 78% with comparison to conventional treatment technology.

The drawback of this technology is that ,the treatment of raw-water with turbidity more than 500 NTU is not cost effective with SRP technology..

ALUM DOSING TANK

SRP DOSING TANK

THE PILOT PLANT PICTURE SHOWS THE DOSING OF SRP (90%) AND ALUM (10%) OF TOTAL ALUM REQUIREMENT IN WATER TREATMENT PROCESS.

ADVANTAGES OF SRP TECHNOLOGY

- The reduction in volume of sludge substantially.
- Reduction in alum consumption 80 – 90 % .
- 100% water recovery , comparison to conventional process 15-20% water loss as sludge.
- Zero wastewater discharge.
- Reduction in cost of treatment i.e.40-60 %
- Reduce pressure on the limited resources of raw material necessary for the production of alum.
- Save the Natural-Water-Bodies from alum contaminated sludge pollution.
- The process is simple and does not involve use of much additional equipment for implementation;
- Saving of Rs 65 crore per year of our Nation, by adaptation of this new renovated Technology in Drinking Water Treatment processes in India.

PILOT PLANT TREATED WATER OUT- LET

LIME TREATMENT OF SLUDGE

SLUDGE DRYING BED OF PILOT PLANT