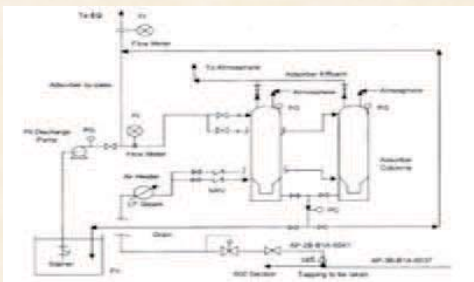


Intervening Technology/Technique	Removal of Fluoride from the Wastewater
About the industry	M/s. Reliance Industries Limited (VMD) is the pioneering Petrochemical unit in India. RIL-VMD is Asia's only producer of ACN (Acrylonitrile) and India's only producer PBR (Poly butadiene rubber) located in Vadodara, Gujarat.
Implemented Techniques/Technology	<p>Before</p> <ul style="list-style-type: none"> The concentration of fluoride generated in the wastewater of PBR plant was around 40-50 ppm, whereas the discharge norms for fluoride is 1.5 mg/L. Although the final discharge norms were meeting, still the high concentration of fluoride concentration in the final effluent was a cause of concern while providing the end of pipe treatment. <p>After</p> <ul style="list-style-type: none"> Root cause analysis is carried out in order to check if the generation of fluoride could be eliminated by any means. But this is not possible as the process itself generates such high concentrations of fluoride. Therefore it is thought to provide an ISBL (Inside battery limit) treatment by segregating the fluoride stream. Activated Alumina has been considered the best technology for fluoride removal from aqueous solutions. It is currently use to treat PBR-II wastewater stream. Adsorptive process is simple requiring a flow rate across the media with a contact time. Remediation and municipal fluoride removal systems normally require regeneration to make them cost effective. Regeneration is accomplishes by a simple process whereby a dilute caustic solution is use to strip the adsorb fluoride and other dissolve contaminants off of the surface of the media. The caustic step is followed by rinsing and then the recondition with sulfuric acid. As some of the alumina can be dissolving during regeneration it is recommend planning for periodic media “top-up”. <p style="text-align: center;">Schematic diagram for removal of Fluoride</p>  <p>The schematic diagram illustrates the fluoride removal process. It shows a wastewater stream entering a system with several tanks and pipes. Key components include: <ul style="list-style-type: none"> Flow Water input at the top. Adsorption Tank where fluoride is captured. Regeneration Tank where a caustic solution is used to strip fluoride from the media. Discharge points for treated water and spent regenerant. Flow Meters and Control Valves throughout the system. Reconditioning step using sulfuric acid. </p>



De-fluoridation Unit-PBR –II plant

Benefits	
<i>Economical</i>	<ul style="list-style-type: none">• A cost effective process is developed for reduction of fluoride (to <10 ppm) using spent (waste) alumina.
<i>Environmental</i>	<ul style="list-style-type: none">• Decrease in the toxicity levels earlier created due the presence of higher concentrations of fluoride.• The benefits from this modification to the treatment scheme helps in reducing the Fluoride levels from 30 ppm to less than 5 ppm.

