

The operating cost (OPEX) of Water Innovations Regenerable Ion Exchange Water Recycling systems (WI-RIX-WR) includes regeneration chemicals, wastewater treatment, bag filters, operating electricity, replacement resin & media, and labor. Generally applicable to all WI-RIX water recycling (WR) and Deionization (DI) systems, this cost estimate is for a WI-RIX-25-WR with assumptions for input costs & operating parameters, assuming 24-hours operation 26-days per month at a continuous 25 gpm service flow. It's important to note that the following operating cost estimate is based on assumptions that may not be applicable to all facilities with their different costs and especially with different frequency of regeneration and should be utilized for reference only and can be re-calculated with actual costs.

Regeneration Chemicals

Assuming 300uS feedwater that would require 2.3 cation & 2.5 anion regenerations per day, that 50% NaOH costs \$3 & 32% HCl \$2.50 per gallon, with each cation regeneration consuming 10-gallons of HCl for a total of 25-gallons per day at a cost of \$62.50, and anion regeneration that consumes 5-gallons of NaOH for a total of 12.5-gallons per day at a cost of \$37.50 per day, the total cost for regeneration would be \$100 per day or \$2,600 per month.

Wastewater from Media Backwash and Resin Regenerations

Assuming one (1) backwash per week that requires 150-gallons per vessels or a total of 300-gallons of water generating 300-gallons of waste with a water/sewer cost of \$10/1,000-gallons and treatment cost of \$5/1,000-gallons, the cost for a total of 1,200-gallons is \$18 per month. Knowing each cation regeneration generates 250 gallons and each anion regeneration 295-gallons of waste and assuming 2.3 cation and 2.5 anion regenerations per day, total wastewater generated would be 1,303-gals/day or 33,878-gallons/month. Costs include \$170 (34 x \$5/1000-gal) for regeneration DI water and \$170 (34 x \$5/1000-gal) for wastewater treatment for a total cost of \$340 per month.

Bag Filters

Assuming the 2 bag filters are replaced once a week, the expense assuming a cost of \$5 each is \$40 per month.

Resin Replacement

Assuming replacement every 4 years of 14ft³ of cation resin at \$200/ft³ and 14ft³ of anion resin at \$350/ft³, the cost is \$7,700 assuming one man-day at \$200 and disposal at \$450 for 3 drums, the total cost is \$8,400 or \$175 per month.

Carbon Replacement

Assuming carbon replacement every 12-months as recommended and material cost for 6 ft³ of \$900 plus ½ day labor at \$100, the total expense is \$1,000 or \$84 per month.

Labor

Assuming an hourly wage of \$25 per hour and a requirement of 1.5-hours, labor expense would be \$975 per month.

Electricity

Assuming the system is operating on 460V 3Ph power, and electricity cost is \$0.50 per KWH, the cost per month to operate the feed and DI water pumps is \$175 per month.

Total Operating Cost for WI-RIX-25-WR

As detailed above, the total cost per month to recycle 936,000 gallons of rinsewater is estimated at \$4,232, producing 35,078 gallons of waste for total water recovery of 96.3% at a cost of \$4.52 per 1,000-gallons DI water.