

## **Integrity Municipal Systems Successfully Restores Four Bulk Emergency Chlorine Vapor Scrubber Systems for Eastern Municipal Water District in California**

In October 2014, Eastern Municipal Water District (EMWD) selected Integrity Municipal Systems, LLC (IMS) to clean, inspect, and restore four Bulk Emergency Chlorine Vapor Scrubber Systems. These systems, installed in May 1998 (San Jacinto Valley Regional WRF), December 2000 (Temecula Valley Regional WRF), and July 2006 (Perris Valley Regional WRF and Moreno Valley Regional WRF), possess liquid caustic storage capacities ranging from 14,500 gallons to 38,800 gallons. Each of these systems is designed to protect plant workers and nearby population centers from potentially deadly releases of chlorine gas. Keeping these systems in safe and reliable operation is a paramount concern for EMWD.

EMWD selected IMS to perform this critical work based on the extensive experience of key IMS personnel with Bulk Emergency Chlorine Vapor Scrubber Systems – IMS CEO, Roop Jain, P.E., was the original designer and patent holder of the systems – and the innovative plan devised by IMS to clean

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Erik Jorgenson, P.E.  
Senior Civil Engineer  
Eastern Municipal Water District

and acid wash the systems. IMS’ plan removed caustic solids while at the same time preserving 115,000 gallons of caustic and minimizing residual waste liquid to less than 10 percent.

Each system was drained, acid washed, and wiped clean. Each of the fiberglass reinforced plastic (FRP) storage tanks and scrubbers was then thoroughly inspected by independent FRP engineers and the FRP manufacturer. Following each inspection a status report with recommendations for repair was submitted to EMWD’s engineers, Erik Jorgenson, P.E. and Gabriel Buena-gua, P.E., for review and approval.

FRP repairs included grinding and relining areas showing signs of chemical attack to the corrosion liner or secondary laminates, and double-coating repaired areas with hot resin

and wax coating. Stress fractures were discovered in the north caustic storage tank at the Moreno Valley Regional WRF extending over the entire bottom of the tank. IMS removed the stress fractures and laminated a new structural bottom for the tank. IMS also installed a new 100 mil liner in the bottom of the Moreno Valley Regional WRF south tank.

Exterior PVC drain/overflow and sight-glass piping was replaced on all four systems. FRP recirculation discharge piping was replaced as needed. Miscel-



*Perris Valley, EMWD*

laneous items, such as scrubber and tank gaskets, pressure gauges, gauge guards, and fan v-belts, were replaced as necessary. The exterior of each caustic storage tank received a new gel coating, and all of the exhaust fans and recirculation pumps were painted. Non-essential fittings in the lower sections of the caustic storage tanks were either removed altogether or relocated to minimize any chance of a major leak.

All of the work was performed by IMS personnel in strict accordance with EMWD Safety Regulations. EMWD takes great pride in its safety record and is recognized by Cal/OSHA as a Cal/STAR site, consistently going above and beyond minimum safety standards.

The cleaning and restoration work completed by IMS extended the useful life of each of the systems and significantly reduced the opportunity for future system failures.

EMWD Senior Civil Engineer, Erik Jorgenson, P.E., expressed the views of the EMWD team following completion of the cleaning and restoration project: “Our Operations staff was very pleased by the dedication and professionalism of IMS personnel and the manner in which they conducted themselves.”

# EMWD Bulk Emergency Chlorine Vapor Scrubber Systems After Restoration



Moreno Valley



San Jacinto Valley

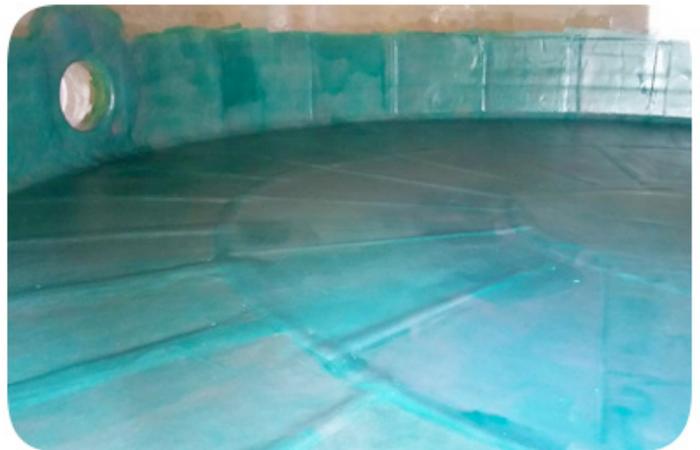
**BEFORE**



**AFTER**



Temecula Valley Scrubber Interior Before/After Acid Wash



Moreno Valley Scrubber – Before/After FRP Tank Interior Refurbishment