

BRIDGING THE GAP

Your Connection to Engineering Services

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WASH WATER-TO-BRINE RECYCLING SYSTEM

Have you ever wondered how Caltrans keeps ice off winter roads?

For Caltrans maintenance crews, winter is a busy season. Ice on roadways presents safety issues for the traveling public, especially during the holidays when more people are on the roadways. One of the most effective solutions to de-ice roadways is spraying salt brine. Brine can also be a preventative method when sprayed before a winter snowstorm.

Brine, made by mixing rock salt with water, is more useful, cost-effective, and environmentally friendly than plain rock salt by protecting local plants not accustomed to the salt. It is less concentrated, using less salt for similar results. It works instantly unlike rock salt which needs to absorb moisture in the air or snow first before it can melt the ice. It is easier to stick to roadways because it is in liquid form.

Using brine is the best option for our maintenance crews. Caltrans loads it into tanks on the back of maintenance vehicles so crews can begin de-icing roads. These trucks need to get washed regularly in the winter since the salt in the brine can be corrosive to the trucks. Most Caltrans maintenance stations have wash racks so maintenance staff can conveniently wash their vehicles. However, the wastewater from these wash racks in the winter can get very salty.

Regional boards do not want this salty water to get disposed to groundwater or surface water. One solution is to recycle that salty water.

Caltrans DES Water/Wastewater branch designs systems that capture, treat, and reuse wash rack water to create brine. Older wash rack systems were too

small for larger maintenance vehicles, had high energy use, and required manual cleaning of sediment basins. Newer designs include a large sump that can be cleaned with a front-end loader and a passive gravity wash water treatment with onsite disposal of treated wash vs complex filtration recycle wash water treatment systems with evaporation disposal. DES developed and piloted the salt brine generation system with UC Davis.

Wastewater from the wash rack is treated using a sand-oil separator, UV disinfection, and sand and carbon filters. This treated water is then stored in a storage tank. The treated water is then mixed with rock salt that is loaded in a hopper to create brine. The brine is stored in a tank so it is ready to use for maintenance to keep our roadways safe!

Caltrans Office of Electrical, Mechanical, Water and Wastewater Engineering designs innovative and efficient recycling systems to keep winter roads safe without the risk of environmental hazards from traditional rock salt use.

