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#### **Research & Innovation Implementation Program**

Identifying Innovations for Statewide Implementation

Communicating Research Results & Innovations throughout PennDOT

Facilitating Practical Use of Innovative Tools and Methods



# Salt + Water = Brine: Warren County Supplies Four Counties

Warren County created an efficient salt-brine making process that supplies four District 1 counties: Warren, Forest, Venango, and Crawford. Upon completion of a construction project, a salt-brine maker became available and Assistant Highway Maintenance Manager Dennis Waite put it to use at the County Garage. Equipment Operator Douglas Becket built a processing plant around the brine maker that achieves efficiency through automated high-volume and high-quality production.



#### A Six-Step Production Process:

The brine maker is loaded with evaporated salt



Water is added through spray nozzles



Brine is pumped from the brine maker to storage tank



A control panel automates the transfer of brine from maker to storage tanks 1-4



Gauges provide continuous production and quality control monitoring



A tanker truck distributes brine to county stockpiles



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## INNOVATION INFORMATION





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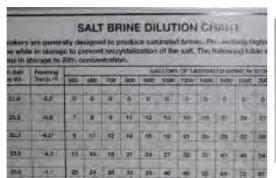
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### Keys to Successful Brine Making:

#### **Continuous Quality Control**



Automated pumping and transfer system provides continuous readouts of product quality



Adjustments to maintain product quality are fast and easy



Product is optimized for low temperature performance

#### **User Friendly Product**



Blue dye increases product visibility in storage tanks and helps equipment operators work with confidence during roadway applications



High quality product flows easily through pipes and equipment, minimizing chances of malfunctions and breakdowns

#### Standardization and Consistency



Standard valves and piping used by all customer counties make for smooth brine transfer operations

#### **Quality Raw Materials and Equipment**



Clean solar salt greatly reduces equipment maintenance and downtime (vs. mine salt high in particulates, shown clogging a pipe above)



Cone-shaped tank bottom allows solid particulates to settle for easy clean-out



Mercury switches in brine maker automate water saturation and prevent overflow



Storage tanks located in containment wells minimize environmental impact of spills and allow easy clean-up

#### **Cost Savings**

- Volume production and process automation save unit costs
- Customer counties save by not duplicating brine-making facilities