1. **Issue Identified:**

Brine Rates and Mixtures for Pre-wetting Salt

2. **Summary of Problem:**

Illinois Department of Transportation seeks to determine the most effective mixture and rates of brines typically used by the agency to pre-wet rock salt, depending on temperature and road conditions (i.e., wet, slush, snow covered, ice packed, and snow packed). The various brine mixtures are listed as follows:

- NaCl brine
- 80% NaCl brine/20% biomelt mix
- 70% NaCl brine/30% biomelt mix
- 65% NaCl brine/30% biomelt/5% CaCl brine
- 60% NaCl brine/30% biomelt/10% CaCl brine
- CaCl brine

IDOT also seeks to determine the time it takes the solid salt with the various mixtures to melt different thicknesses of ice pack or snow pack as well as to determine the time it takes for the ice pack or snow pack to refreeze. IDOT is also in need of determining the rate of liquid used per ton of solid salt (i.e., when to use 6 to 10 gallons/ton vs increasing rates).

3. **Desired Results / Outcome:**

This research project would result in temperature minimums for each type of brine mix used to pre-wet salt to determine the most cost-effective ways to treat roadways given their surface conditions. Researchers would determine the effect of increased rates of liquid used per ton of salt for each brine mixture. They would also determine the time needed to melt different thicknesses of ice pack or snow pack as well as the time for the same ice pack or snow pack to refreeze.