

MICHIGAN DUST CONTROL BID GUIDE & BEST PRACTICES



THE DIFFERENCE BETWEEN LIQUIDOW® AND RAW BRINE

LIQUIDOW®
Calcium Chloride Solution

OxyChem®

THE LIQUIDOW® DIFFERENCE

KNOW WHAT WORKS

Calcium Chloride (CaCl₂)

- Used for 100 years in dust control; absorbs water even at low humidity; calcium is an essential plant macronutrient

Magnesium Chloride (MgCl₂)

- Absorbs water even at low humidity; magnesium is an essential plant macronutrient

Sodium Chloride (NaCl)

- An ineffective dust control agent that absorbs water only at high humidity

Potassium Chloride (KCl)

- An essential plant nutrient that is ineffective for controlling dust

KNOW WHAT YOU'RE BUYING

In Michigan, the most commonly available dust control products can be categorized and compared as follows:

WEAK Raw Brine

- 21.5% or less combined effective dust control agents - Calcium Chloride (CaCl₂) and Magnesium Chloride (MgCl₂)
- Very high in Sodium Chloride (NaCl) – an ineffective dust control agent and bad for the environment

NORMAL Raw Brine

- 21.5% or more combined effective dust control agents
- High in Sodium Chloride – still ineffective and bad for the environment

LIQUIDOW®

- Consistently 38% CaCl₂, concentrated and effective dust control agent
- Very low in Sodium Chloride – less environmental impact than Raw Brines

VALIDATE WHAT YOU'RE BUYING

In a 2017 Comparative Lab Test, 5 commonly used Michigan brines were tested alongside LIQUIDOW® 38%. The results are clear – be aware.

BRINE TYPE	DENSITY (LBS/GAL)	SPECIFIC GRAVITY	CaCl ₂	MgCl ₂	KCl	NaCl	EQUIV CaCl ₂	EQUIV APP (gal/yd ²)	EQUIV APP (gal/ln-mi)	NaCl LOAD (lbs/ln-mi)
Michigan Brine #1	10.58	1.272	21.7%	3.6%	1.0%	5.6%	25.9%	0.43	3,056	1,807
Michigan Brine #2	10.72	1.288	21.7%	4.5%	1.8%	4.7%	26.9%	0.41	2,897	1,450
Michigan Brine #3	10.32	1.240	19.0%	3.1%	0.8%	4.9%	22.6%	0.51	3,593	1,807
Michigan Brine #4	10.56	1.269	17.6%	3.3%	0.9%	5.3%	21.3%	0.53	3,702	2,059
Michigan Brine #5	10.35	1.244	13.0%	2.8%	0.8%	9.4%	16.3%	0.70	4,959	4,813
38% LIQUIDOW®	11.58	1.392	38.0%	0.0%	1.0%	0.7%	38.0%	0.27	1,901	154

WHAT'S SO GOOD ABOUT LOWER APPLICATION RATES?

REPEAT APPLICATIONS TO OFFSET POOR PERFORMANCE MEANS MORE SODIUM CHLORIDE IN THE ENVIRONMENT AND LESS TIME FOR OTHER PRIORITIES.

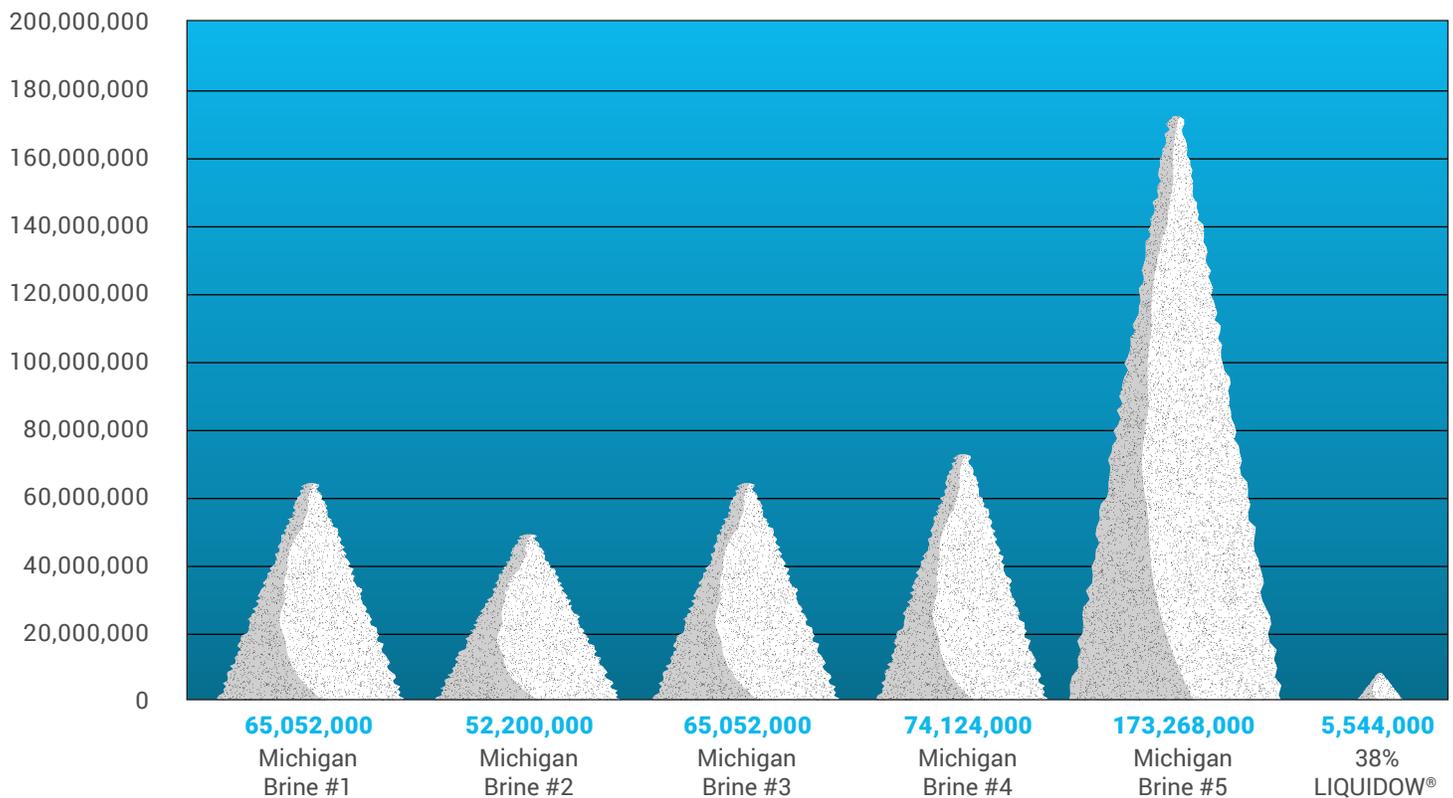
ENVIRONMENTAL IMPACT

WHAT IS THE EXTRA SALT IN RAW BRINES DOING TO THE ENVIRONMENT?

Since NaCl is a solid under most summer conditions, it provides little to no dust control benefit. Worse yet, the sodium in NaCl is detrimental to soil structure and permeability. The introduction of a NaCl into the environment without gaining any benefit is obviously contrary to good environmental stewardship.

LIQUIDOW® REDUCES NEGATIVE ENVIRONMENTAL EFFECTS ON MICHIGAN'S UNPAVED ROADS

There are roughly 36,000 miles of unpaved road in Michigan. Assuming every mile of unpaved road was treated comparably by each product, below illustrates the **total pounds of sodium chloride (salt)** that would be introduced into the environment. LIQUIDOW® introduces the lowest.



ADDITIONAL QUESTIONS TO CONSIDER:

1. What application rate am I being told to use by my supplier on the bid sheet?
2. How much extra time needs to be spent to achieve the application rate?
3. When considering the extra time, how much more am I paying in labor hours and equipment costs?
4. How many extra road grades do I need to do for the extra applications?
5. What else could be accomplished by these time savings?

BID BEST PRACTICES

ENSURE YOU GET WHAT YOU PAY FOR – FOLLOW THESE 5 STEPS FOR AN IDEAL BID:

1. Establish minimum product composition requirements:

- Hygroscopic salt content (CaCl₂ + MgCl₂) greater than 21.5%
- Impurity salt content (NaCl + KCl) less than 6%
- No waste products repurposed for dust control

2. Require independent chemical analyses from each supplier dated within 6 months of bid submittal

- Check the composition of each product for CaCl₂, MgCl₂, KCl, NaCl and heavy metals

3. Compare products with different compositions on an apples-to-apples basis:

- Base cost comparisons on delivery of equal amounts of hygroscopic salt (CaCl₂ + MgCl₂) to the road. Formulas for comparing applications of mineral brine to 38% CaCl₂ are shown below

$$\text{Equiv. \% CaCl}_2 \text{ in brine} = \text{Actual \% CaCl}_2 + (\text{Actual \% MgCl}_2 \times 1.15)$$

$$\text{Equiv. App rate of brine} = \frac{(\text{CaCl}_2 \text{ App Rate} \times \text{CaCl}_2 \text{ density} \times \text{Actual \% CaCl}_2)}{(\text{Brine density} \times \text{Equiv. \% CaCl}_2)}$$

- Example: If 38% CaCl₂ with a density of 11.58 lbs/gal is applied at 1901 gal/lane-mi, what is the equivalent application rate for brine that is 17.6% CaCl₂, 3.3% MgCl₂ with density of 10.56 lbs./gal ?

$$\text{Equiv. \% CaCl}_2 \text{ in brine} = 0.176 + (0.033 \times 1.15) = 0.214 \text{ or } 21.4\%$$

$$\text{Equiv. App rate of brine} = \frac{(1901 \times 11.58 \times 0.38)}{(10.56 \times 0.214)} = 3702 \text{ gal/lane-mi}$$

4. Require load tickets for product delivered to your roads

- Creates a record that product was delivered, what type of product it was and how much of it was delivered

5. Allow yourself to do one RANDOM spot check during the dust season

- Utilize 3rd party to analyze random test sample to ensure supplier is meeting theirs and your bid spec

6. Outline a financial penalty for product deliveries that fail to meet contractual bid requirements

- For example, if delivered product is off-spec on Equiv. % CaCl₂, then payment is withheld as follows:

1-2% Lower Concentration – 10% Payment Withheld

2-3% Lower Concentration – 20% Payment Withheld

3-4% Lower Concentration – 30% Payment Withheld

4-5% Lower Concentration – 50% Payment Withheld

>5% Lower Concentration – 100% Payment Withheld