Brine use for dust and ice control
Bowman County has used Stabilock, a natural occurring by-product of the vegetable oil refining process for 4 years.

The product is spray applied at a rate of 42.3 oz per sq yard after the surface aggregate is scarified to a depth of 1-2 inches using stinger teeth on a mother grader.

The product is then mixed with the aggregate by motor grader, relayed and packed with a rubber tired roller to finish the road crown.

Enough aggregate must be mixed with the product to adequately absorb the product. The product may bleed to the surface in hot weather if not properly incorporated.
Studies show brine application is very similar to conventional applications

- Researchers observed that treatments lowered dust levels improving visibility, air quality, and safety conditions

- Dust levels decreased with increased surface moisture

- A secondary benefit observed that treatments reduced the need for grading by an estimated 50%
North Dakota Department of Health guidelines for the use of oilfield salt brines in dust and ice control

https://www.ndhealth.gov/WQ/rules.htm
GUIDELINES FOR USE OF OILFIELD SALT BRINES

DEPARTMENT OF HEALTH REQUIREMENTS
Produced brine shall not have hydrogen sulfide concentrations which constitute a hazard.

Historical/current chemical analyses should indicate calcium plus magnesium concentrations greater than 10,000 milligrams per liter (mg/L), and chloride concentrations should be greater than 75,000 mg/L.

Chemical analyses conducted within the previous 36 months shall be available for the brine sources under consideration.
### Bottineau County Chemical Analysis Results

**Chemical Analysis of Sample**

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Result</th>
<th>Units</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductivity</td>
<td>222000</td>
<td>umhos/cm</td>
<td></td>
</tr>
<tr>
<td>Dissolved Solids (C)-Total</td>
<td>138000</td>
<td>mg/L</td>
<td>Very High</td>
</tr>
<tr>
<td>Hardness Total (as CaCO3)</td>
<td>20500</td>
<td>mg/L</td>
<td>Very High</td>
</tr>
<tr>
<td>Alkalinity (CaCO3) (Total) See Comment 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH See Comment 1</td>
<td>12.2</td>
<td>mg/L</td>
<td>High</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>0.532</td>
<td>mg/L</td>
<td>High</td>
</tr>
<tr>
<td>Manganese (Mn)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>5960</td>
<td>mg/L</td>
<td>High</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>1360</td>
<td>mg/L</td>
<td>Very High</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>95200</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>3550</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Carbonate (CO3) See Comment 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicarbonate (HCO3) See Comment 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfate as (SO4)</td>
<td>&lt;1000</td>
<td>mg/L</td>
<td>Very High</td>
</tr>
<tr>
<td>Chloride</td>
<td>164000</td>
<td>mg/L</td>
<td>Very High</td>
</tr>
<tr>
<td>Fluoride (F)</td>
<td>1.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrate + Nitrite (N) See Comment 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boron (B)</td>
<td>185000</td>
<td>ug/L</td>
<td></td>
</tr>
<tr>
<td>Aluminum (Al)</td>
<td>15000</td>
<td>ug/L</td>
<td></td>
</tr>
<tr>
<td>Silica (SiO2)</td>
<td>&lt;20</td>
<td>mg/L</td>
<td></td>
</tr>
<tr>
<td>Beryllium (Be)</td>
<td>200</td>
<td>ug/L</td>
<td></td>
</tr>
<tr>
<td>Chromium (Cr)</td>
<td>200</td>
<td>ug/L</td>
<td></td>
</tr>
<tr>
<td>Nickel (Ni)</td>
<td>676.</td>
<td>ug/L</td>
<td></td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>539.</td>
<td>ug/L</td>
<td></td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>805.</td>
<td>ug/L</td>
<td></td>
</tr>
<tr>
<td>Arsenic (As)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Application for Brine or Dust Control use

Notification of Oil Field Brine Use for Ice or Dust Control
(Produced Water Only)

Name of Owner/Organization: Butterman County RD Dust
Mailing Address: 101 Ohner St
City: Bismarck
State: ND
Zip Code: 58501

Contact Person: Patrick Curdel
Telephone: 701-288-3606
Cell Phone: 701-264-1607
Email Address: rick.p.6106@yahoo.com
Office Location: Bismarck

Understanding and Acceptance of the Guidelines (Yes/No):
Yes

Base Character Required by ND Department of Health?
Yes

Date of Chemical Analysis:
2/15/15

Brine Source/Producer:
Burkard Petroleum

Special Comments on Brine, Brine Source, or Spreader:
Will be doing 12 to 200 per truck, stay stretched monthly.

Brine Source Location (Map in sec 000):
159-81-50-19

Brine Storage Location (Map in sec 000):
Bismarck

Geologic Formation(s) of Brine Source:
Wayne Formation

Vehicles Engaged in Spreading the Brine:
1962 Ford LTL 9000

Vehicles Clearly Marked (Yes/No):
Yes

Log Maintained in Each Vehicle and Collected Each Week (Yes/No):
Yes

Describe proposed spreading rate (gallons per square yard) and anticipated application frequency:
Dust Control: 
- 2 gal of gal/lb on first pass
- Then 0.17 gal/lb for top coat
- For a total of 1 1/2 gal

Ice Control:

Owner Certifies that all spreading for ice or dust control will abide by Guidelines provided by North Dakota Department of Health.

Signature:

Date of Signature: 6/2/16

Title: Road Superintendent

Instructions:
# Operators Log for Brine use

<table>
<thead>
<tr>
<th>Operator's Brine Spreading Log</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operator's Name:</strong></td>
</tr>
<tr>
<td><strong>Brine Spreading Dates:</strong> May to June</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Road Name</th>
<th>Segment (500 ft.)</th>
<th>Change in Grade</th>
<th>Change in Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>JT</td>
<td>5-27 60 57</td>
<td>20th Ave NE 2 1/4 in. NE</td>
<td>3-25 60 57</td>
<td>1 1/2 in.</td>
</tr>
<tr>
<td>TC</td>
<td>6-27 60 57</td>
<td>2 1/2 in. southeast by 3-25 60 57</td>
<td>6-27 60 57</td>
<td>1 1/2 in.</td>
</tr>
</tbody>
</table>

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**Bottineau County Brine Applicator**

701-228-3698
Bottineau County Roads after Dust Control

Bottineau County Road 57 Long Lake Loop
Bottineau County Dust Control Pilot Picture comparison
Base one Stabilizer being used on a Bottineau County Township road
Bottineau County’s Water Truck
Digital Monitoring System

Dual use
Veritech industries – installation
Storage Tanks and Facilities

Local Oil companies donated storage tanks
Only fee is trucking expenses
Bottineau County charges .25 cents per foot.

Conventional dust control charges $1.00 or more per foot.
Ice Control Benefits: Cost saving for the County
The commissioners and public are very happy with the results of the water truck.

Many private parties are asking for the County to do their roads and driveways, however we are not ready to compete with local contractors.

While the application process may seem long the initial cost benefits we have seen out-weighs the paperwork.