Guidelines for the Use of Oilfield Salt Brines for Dust and Ice Control

The North Dakota Administrative Code §33-24-02-02(5)(a)(2) states that wastes are exempt from waste management rules and are not considered a waste when it is: "(2) Used or reused as effective substitutes for commercial products; . . "

When used in the manner outlined in this guidance, the North Dakota Department of Health (NDDoH) considers oilfield-produced saltwater (brine) to be an effective substitute for commercial dust and ice control products. If oilfield saltwater brine is used in a manner that does not fall within these guidelines it may be considered illegal disposal of a waste, and the user may be subject to penalties pursuant to the requirements in North Dakota Century Code Chapter 23-29 and Chapter 61-28, and North Dakota Administrative Code Article 33-16, Article 33-20, and Article 33-24.

The use of certain oilfield salt brines may be acceptable in dust and ice control on North Dakota roads and highways if the following conditions are met:

1. Definitions

   a) Owner/End User: The person, government or business that owns or has legal control over roads or parking lots where oilfield salt brine will be applied for ice or dust control.
   b) Producer: The company which owns the oil well(s) and/or tank batteries from which oilfield brine will be acquired for the purpose of ice or dust control.
   c) Transporter: The person or company transporting oilfield brine from the producer=s loading site to the owner/end user storage facility or brine-spreading vehicle.
   d) Brine Spreader: The driver and vehicle applying oilfield brine to roads or parking lots for ice or dust control.

2. Criteria for the choice of brine

   a) Produced brine shall not have hydrogen sulfide (H_2S) concentrations which constitute a hazard.
   b) 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.
   a) Chemical analyses conducted within the previous 36 months shall be available for the brine sources under consideration. Parameters should

include: **pH; specific conductivity; major ions (including iron, manganese, sodium, potassium, phosphorous, SO_4, HCO_3, CO_3 and OH); total dissolved solids (TDS); total alkalinity; oil and grease; and the trace elements of aluminum, ammonia, arsenic, barium, boron, copper, chromium, lead, nickel, selenium and zinc.**

b) Only brine from production waters shall be distributed for use as ice or dust control. No drilling fluids, exploration fluids or work-over liquids shall be used in this capacity.

c) Brine distributed for ice or dust control shall be relatively free of oil and sludge, leaving no visible sheen on any surface water.

d) The brine producer shall notify the transporter/end user of any changes in production sources or procedures that have the potential to significantly change or alter the chemical or physical character of the brine.

e) Once brine to be used for ice or dust control is transferred to a transporter or end user, proper handling and use of the brine is the responsibility and liability of the transporter and/or end user. It is the owner=s responsibility to immediately report any significant change in brine quality/character to the NDDoH.

3. Brine users

a) All road or parking lot owners planning to use oilfield salt brine for ice or dust control shall initially notify the NDDoH by mail or by electronic submission using the form provided below.

b) Owners shall provide the department with details as follows:
   1. The name, address and telephone number of the owner (person, company or municipality) planning to have the brines applied, the person(s)/company doing the spreading and the license plate number(s) of the brine spreader truck(s).
   2. A legible map of the municipality or area which identifies local brine storage locations other than the source site.
   3. The proposed rate and frequency of application.
   4. The name of the brine producer and loading location (township, range, section, and the quarter section).
   5. The geological formation from which the brine is produced.
   6. A current analytical report as described in criteria 2(c) above.
   7. Owner certification of willingness to abide by these guidelines (official signature and date required).

c) All transporters and brine spreaders shall be subject to spot checks by North Dakota Department of Mineral Resources Oil and Gas Division, NDDoH and local or state law enforcement officers.

d) An annual synopsis of the ice/dust control programs shall be prepared and maintained by the owner for review upon request, indicating the locations, sources, rates and volumes of brine spread. For ice control, the

report shall be completed by June 1; and for dust control, the report shall be completed by January 1. Each annual report shall be maintained by the owner for a minimum of three years.

e) Significant revisions to the spreading plan shall be communicated by letter to the department before implementing the revision. "Significant" shall mean change of brine supplier, brine character, contact person, contract spreader, or major change in spreading equipment.

4. Brine spreading guidelines

a) When spreading oil field brine for ice or dust control, each vehicle shall display a clearly legible sign identifying it as a brine applicator (magnetic signs acceptable).

b) The application of brine to road surfaces must be performed in a way that minimizes impact to the environment. Brine may only be applied at a rate and frequency necessary to control dust or ice. The rate and frequency must be controlled to minimize the impact of brine infiltrating to ground water or running off the road surface into roadside ditches, streams, creeks, lakes or other bodies of water.

c) A log of all spreading including dates, rates, volumes, locations and brine source shall be kept in the spreader truck and company/owner office. A suggested daily log form is included as the last page of this posting. The office copy shall be updated at least weekly and kept on file for a period of three years. These logs shall be made available upon request to inspectors from the state or local department of health, local or state law enforcement and/or the state oil and gas inspectors.

d) Recommended rates for dust control: The initial application of brine shall be spread at a rate of approximately one-half (2) gallon per square yard, after the road or parking lot has been freshly graded. *(In areas where erionite is suspected, a light application of brine (or water) should be laid down before grading to minimize dust production.)* Subsequent applications shall not exceed an application rate of one-third (1/3) gallon per square yard per month, unless weather or traffic conditions require more frequent applications to suppress the dust or stabilize the road bed. Application rates for race tracks and mining haul roads shall not exceed one (1) gallon per square yard.

   1. Brine for dust control shall be applied by use of a spreader bar, with shut-off controls accessible from the cab of the truck.

e) For ice control, application rates and frequency shall be similar to those used by the North Dakota Department of Transportation.

   1. For spreading liquid brine, the truck shall employ a spreader bar, with shut-off controls accessible from the cab of the truck.
   2. Consideration should be given to reducing the amount of liquid brine applied, if possible, near any stream, creek, lake, wetland, or

body of water.

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

Name of Owner/Organization/Municipality/County	Mailing Address	City	Zip

Contact Person	Telephone	Cell Phone	E-mail Address	Office Location

Understanding and Acceptance of Use Guidelines (yes/no)

Brine Character Reviewed by ND Department of Health?	Date(s) of Chemical Analysis	Brine Source/Producer
Yes No		

Special Comments on Brine, Brine Source, or Sample?

Brine Source Location (twp, rng, sec, QQQ)	Brine Storage Location (Twp, rng, sec, QQQ)

Geologic Formation(s) of Brine Source	Vehicles Engaged in Spreading the Brine	

Vehicles Clearly Marked (yes/no)

Log Maintained in Each Vehicle and Collected Each Week (yes/no)

Describe proposed spreading rate (gallons per square yard) and anticipated application frequency

Dust Control:

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:

Title

Instructions:

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

Name of Owner/Organization/Municipality/County - This is the name of the end user of the brine. Example - XYZ County or AXZ Stock Yard

Mailing Address/City/Zip - The address of the end user.

Contact Person/Telephone/Cell Phone/E-Mail Address - This is the contact information for those in charge of the actual brine spreading. This can be the person at the county or municipality who is directly in charge, or the contact at the company contracted to spread the brine.

Office Location - This will generally be the office of the owner's personnel who will be maintaining the records, unless outsourced. If record keeping and annual synopsis is the responsibility of the spreading company, then that is the office location to be reported.

Brine Character Reviewed by ND Dept. of Health - Has the brine analysis been reviewed by the NDDoH within the last 36 months?

Date(s) of chemical analysis - this is a list of the analysis dates for the brines under consideration.

Brine Source Producer - This is the name of the company owning or operating the oil well or tank battery that the brine is picked up from.

Special Comments on Brine, Brine Source, or Sample - If there are any special considerations or notes regarding one of these subjects, list them here.

Brine Source Location(s) - Please list, by number, the Township, Range, Section and quarter section of the source or sources. The source(s) will generally be a collection tank battery rather than a single oil well, as the owner will want a ready supply of brine. If there is more than one source, such as sources distributed around a large county, then each source location should be identified.

Brine Storage Location - If the brine is being delivered to a central (or several) storage location for subsequent transfer to spreading trucks, list the location in the same manner as for the brine source location, unless there is a more appropriate street address.

Geologic Formation of the Brine Source - This information can be obtained from either the brine producer, or the ND Department of Mineral Resources, Oil and Gas Division.

Vehicles Engaged in Spreading Brine - This is the make and licence number of each truck that will be modified to spread brine.

Owner Certifies… - This is the person owning (or responsible for) the property/road(s) that the brine will be used on.

Operator's Brine Spreading Log

County/Municipality/Owner	Brine Source	Operational Dates			Operator
			To		

Date	Road Name	Rd Segment - (from - to)	Volume (barrels) Rate (gal/sq yd)	Dust	Ice