ALTERNATE PROCUREMENT REQUEST

OFFICE OF MANAGEMENT AND BUDGET
CSD/STATE PROCUREMENT OFFICE
SFN 51403 (7-2016)

Submit via the Procurement Work Request System:
https://www.nd.gov/omb/
Select OMB Apps Login

Name of Agency or Institution	Business Unit Number	Date of Request	Requisition/Tracking Number (Optional)
NDDOT	801.0	11/10/2016	
Procurement Officer	**Telephone Number**	**Fax Number**	**E-mail Address**
Vanessa Brosten	(701) 328-4466	(701) 328-0310	vbrosten@nd.gov

Description of Service or Commodity - Describe the intended purpose. (Include manufacturer, brand, model, and other identifiers.)
Smith Fertilizer & Grain is currently the west region supplier for the Deicer, Agricultural Based Liquid (Beet). This product is patented and Smith Fertilizer & Grain is the only supplier we can now purchase this concentrate from.

Procurement Type
[X] Noncompetitive Procurement [ ] Limited Competitive Procurement [ ] Purchase from another government entity's contract

Total Cost, including all options for renewal or extension (e.g. $10,000/yr with two renewal options = $30,000)
Estimated 400,000-500,000 gallons purchased annually for all districts. (Approx. $690,000 annually) (Approx $4,140,000 total)

[ ] One-time Purchase
[X] Recurring Purchase

If recurring, describe anticipated future purchases, including on-going maintenance.
There may be re-orders in some or all of our districts. The product will also need to be purchased on an annual basis for ice control on our roadways. See attached contract, 5 renewals.

Non-Competitive Only

Contractor	Contact Person	Telephone Number	Fax Number
Smith Fertilizer & Grain	Sara Lewin	(641) 828-8508	(641) 828-8501

Address	City	State	ZIP Code
1650 Quebec St	Knoxville	IA	50138

Indicate whether registration with the Secretary of State is required. See OMB Guidelines for Vendor Registration.
[X] Yes [ ] No

How was the price determined to be fair and reasonable? Describe the negotiation efforts to obtain the best price.
When bid out, prices were competitive with competing vendors. Smith F&G had to increase prices in order to upkeep licensing

Authority for Limited or Non-competitive Procurement

Competition can be limited under the following N.D.C.C. or N.D.A.C. provisions. Check the appropriate authority reference.

- [X] The commodity or service is available from only one source. [N.D.C.C. § 54-44.4-05 (2)(a)]
- [ ] The commodity or service is for experimentation or trial. [N.D.C.C. § 54-44.4-05 (2)(b)]
- [ ] No acceptable bid or proposal was received pursuant to a competitive bidding or competitive proposal process. [N.D.C.C. § 54-44.4-05 (2)(c) and N.D.A.C. § 4-12-11-08)]
- [ ] Commodities are being purchased for over-the-counter resale. [N.D.C.C. § 54-44.4-05 (2)(d)]
- [ ] A used commodity is advantageous to the state and the commodity is available on short notice. [N.D.C.C. § 54-44.4-05 (2)(g)]
- [ ] The commodity is a component or replacement part for which there is not commercially available substitute and which can be obtained only from the manufacturer. [N.D.C.C. § 54-44.4-05 (2)(h)]
- [ ] Compatibility with equipment currently owned by the state is essential to the proper functioning of that equipment. [N.D.C.C. § 54-44.4-05 (2)(i)]
- [ ] The services or the circumstances are of such a nature that deviation from the procurement process is appropriate. [N.D.C.C. § 54-44.4-05 (2)(j)]
- [ ] Products or services exclusive to particular individuals or business entities are required, but competition for that proprietary product or service exists. [N.D.A.C. § 4-12-09-02 (1)(a)]
- [X] Circumstances require that commodities or services be provided by vendors within a specific geographic area, such as equipment requiring local service, on-site service within a specific time, or delivery of ready mix concrete. [N.D.A.C. § 4-12-09-02 (1)(b)]
- [ ] It is determined that a competitive sealed bid or competitive sealed process is impracticable or not in the best interest of the state. [N.D.A.C. § 4-12-09-02 (1)(c)]
- [ ] The commodity or service is available from another government entity's contract. [N.D.C.C. § 54-44.4-13]. NOTE: Attach a copy of the contract. OMB State Procurement Office approval is required regardless of the dollar amount.

Justification and Supporting Documentation

Explain why a fully competitive procurement process is impracticable or not in the best interest of the state. Factual evidence must be provided, sufficient for the approver to independently determine that the justification is true and accurate. Factual evidence must be included or attached, such as written documents, reports, supporting data, affidavits, patent or copyright information, research or other information.

Smith Fertilizer & Grain is now the only supplier licensed to sell the beet juice under patent 6080330 as of August 31, 2016. US Court Appeals of the Federal Circuit decision is attached. The product has proven to work well over the years and the districts all use it on the roads.

Disapproval Consequences

What are the consequence(s), including a dollar estimate of the financial impact, if this request for limited competitive or non-competitive purchase is not approved?

The Department of Transportation won't be able to treat our roads the same as we have in the past. This could in-turn increase the cost of our snow and ice control and decrease our level of service to the public. This may also impact life safety of the traveling public and the environment. The beat juice allows the working temp of liquid salt brine to be lowered so it works better in cold temps. The low working temp also allows the product not to freeze in the storage tanks and plumbing. Freezing product can crack a tank, pump or plumbing which may cause a spill which could be hazardous to the environment.

ALTERNATE PROCUREMENT REQUEST

Occasionally, circumstances arise under which a fully competitive procurement process may be difficult or impossible. Procurement is noncompetitive when there is no bidding process. Limited competition procurements occur when competition is possible, but the requirements of the bid restrict competition to particular suppliers or products. These types of procurement are exceptions to the state policy that purchases be completed through full competition with fair and equal opportunity to all qualified vendors. Therefore, limited and non-competitive procurements should only be used when truly necessary and authorized by state law or rule. Contact the OMB State Procurement Office at 701-328-2740 for assistance.

Approval Authority
The OMB State Procurement Office must approve all determinations over $2,500. Any requests to purchase from a GSA contract or another government entity's contract must be reviewed by the OMB State Procurement Office. If the procurement officer has not provided sufficient evidence to make an independent examination and determination of the material facts of the procurement, the approving official may return the request form for additional justification or require a notice of intent to make a limited or non-competitive purchase. Information technology requests over $25,000 must be approved by the Information Technology Department.

Notice of Intent to Make a Limited or Noncompetitive Purchase
Notice of intent to make a limited or non-competitive purchase may be issued to attempt to identify alternate sources for the needed commodity or service. A notice template is available on the OMB State Procurement Office website. The notice describes the required commodity or service thought to be available only from limited sources or one source, and it invites vendors to contact the procurement officer to propose an alternate source. Use the State Procurement Online system to issue the notice to the appropriate state bidders list and any other known potential bidders.

Determination Not Required - Exemptions
Alternate Procurement determinations are not required for government entities, commodities and services exempted from state procurement practices by N.D. C.C. § 54-44.4-02 as follows:

1. Land, building, space, or the rental thereof. [Note: Leases for office space off the Capitol Grounds must be reviewed by the Office of the Attorney General and approved by OMB Facility Management, ref. N.D.C.C. § 54-21-24.1 and OMB Fiscal Policy 109.]
2. Telephone and telegraph service, electrical light, and power services.
3. Public books, maps, periodicals, and technical pamphlets.
4. Department of Transportation materials, equipment, and supplies in accordance with N.D.C.C. § 24-02-16.
5. Procurements through a contract or other instrument executed by the Industrial Commission under chapters 17-05, 54-17.5, 54-17.6, 54-17.7 and 54-63 and under those statutes in Title 38 authorizing the Industrial Commission to perform well and hole pluggings, reclamation work, equipment removal, leak prevention, and similar work.
6. Services for the maintenance or servicing of equipment by the manufacturer or authorized servicing agency of that equipment when the maintenance or servicing can best be performed by the manufacturer or authorized service agent, or when such a contract would otherwise be advantageous to the state.
7. Emergency purchases as defined under N.D.C.C. § 54-4.4-02 (7) and N.D.A.C. § 4-12-09-04. See SFN 51627 Emergency Purchase Form.
8. Commodities and service $2,500 and below. See N.D.A.C. § 4-12-08-02 (1).
9. Employee benefit services, trust-related services, and investment management services obtained by an agency with a fiduciary responsibility regarding those services.
10. Specific commodities and services as determined by written directive by the Director of OMB in N.D.A.C. § 4-12-01-04 as follows:
    a. Contracts for services of legal counsel with attorneys who are not employed by the state, pursuant to N.D.C.C. § 54-12-08.
    b. Contracts for public buildings and public improvement contract bids, pursuant to N.D.C.C. title 48.
    c. Contracts for architect, engineer, and land surveying services pursuant to N.D.C.C. chapter 54-44.7.
    d. Contracts for concessions, pursuant to N.D.C.C. chapter 48-09.
    e. Grant programs; this does not include procurements using grant dollars.
    f. Professional memberships.

Alternate Circumstances Permitted by Law and Rule Where a Written Determination is not Required

1. Commodities or services produced or provided by correctional institutions or other government entities. N.D.C.C. § 54-44.4-05 (2)(e); N.D.A.C. § 4- 12-15.
2. Commodities and services for which competition is waived under N.D.A.C. § 4-12-09-01(3):
    a. Contracts for legal services, subject to the requirements of N.D.C.C. § 54-12-08;
    b. Contracts for professional witnesses to provide for professional services or testimony related to existing or probable lawsuits in which the State may become a party;
    c. Contracts for temporary administrative law judges pursuant to N.D.C.C. § 54-57-02;
    d. Contracts for medical specialists;
    e. Purchases of copyrighted printed and electronic works when only available from the publisher or producer;
    f. Purchases of materials required for manufacturing and production by a purchasing agency engaged in manufacturing and production operations;
    g. Where immediate expenditures are necessary to ensure the integrity of state records;
    h. Purchases of livestock, fish, insects, and other animals;
    i. Commodities for resale at state-operated concessions;
    j. Purchases of items with cultural, historical, or archaeological significance for museums or archival purposes;
    k. Purchases of works of art;
    l. Contracts for residential treatment and vocational rehabilitation services to ensure continuity of client care and vocational rehabilitation commodities for clients;
    m. Contracts for performers, entertainers, and guest speakers; excluding contracts for education, instruction or training;
    n. Medications, pharmaceuticals, metabolic foods, food supplements, food replacements, vitamins, therapeutics, and medical devices, as prescribed by health care professionals for patients of a state facility or clients of a state program;
    o. Conducting a limited competitive process to purchase heating fuels, ready-mix concrete, sand, gravel, road oil, and bituminous using the level of competition practicable from vendors in a reasonable, specific geographical area; or
    p. Contracts for insurance placed through a broker hired through a competitive or limited competitive process where the broker is hired to elevate insurance pricing and coverage information and make placement recommendations.

Instructions: Requests over $2,500 must be approved by the Office of Management and Budget, State Procurement Office. The Information Technology Department must approve all requests for information technology hardware, software, and services over $25,000. If using federal funds or a grant, check whether the funding source has requirements for noncompetitive purchases.

Step #1
Office of Management and Budget - State Procurement Office Approval (Over $2,500)

Approving Official Name	Telephone Number
Jamie Bostyan	(701) 328-4912

☐ Returned for Further Justification Date: ☐ Send Notice of Intent to Make a Limited/Non-competitive Purchase Date: ☒ Approved ☐ Disapproved

Comments

This AP is approved in accordance with N.D.C.C. 54-44.4-05 (2)(a). The supporting documentation included with this AP states that Natural Alternatives, LLC, owned by Todd Bloomer, holds a patent and is the sole provider of desugared sugar beet molasses. This AP is also approved in accordance with N.D.A.C. 4-12-09-02 (1)(b). Vanessa Brosten contacted me in regards to notification from Smith Fertilizer & Grain that the current contract holder with the NDDOT for ag-based deicer/desugared sugar beet molasses, Prairie Supply, does not have a license on the product to distribute it. Smith claimed that they were the license holder on distribution for the North Dakota area. Vanessa asked Todd Bloomer in the attached email for some verification, and Todd Bloomer replied that Smith Grain and Fertilizer is the authorized distributor for his patented product for use in ND. I called Todd and he said that Smith has a license on the product to distribute it for outdoor road use. He said the Prairie Supply does not have a license to distribute it as Smith does. He stated that Prairie Supply is eligible for triple damages by patent law if they sell it for outdoor use. Based on this information and in accordance with their contract terms and conditions, NDDOT terminated it's contract with Prairie Supply. With this AP, they will enter in to a contract with Smith Fertilizer and Grain as shown in the attached document for 1 year with 5 renewals. Per DOT's legal review of the contract and appropriate contract renewals, this AP is approved until the expiration date listed.

Signature	Date	If Recurring, Expiration Date
Jamie Bostyan	11/18/2016	10/31/2022

Step #2 (if required)
Information Technology Purchases only
Information Technology Department Approval (Over $25,000)
State Procurement will forward to: ITDprocurement@nd.gov

Approving Official Name	Telephone Number

☐ Returned for Further Justification Date: ☐ Approved ☐ Disapproved

ITD Review Considerations: Is the product or service consistent with the agency's strategic IT plan and compliant with North Dakota Enterprise Architecture Standard STD-ITD-001? ☐ Yes ☐ No

ITD Reviewer Comments

Signature	Date

Bostyan, Jamie T.

From: Brosten, Vanessa N.
Sent: Tuesday, November 08, 2016 12:27 PM
To: Bostyan, Jamie T.
Subject: FW: NDDOT Ag-Based Deicer

Hi Jamie,
Below is an email I received from the patent holder of the desugared sugar beet molasses used in our deicing product. Do I need anything else from Todd?

I'm waiting on pricing from Smith Fertilizer and Grain to proceed with our APR.

Here is additional information:
http://www.google.com/patents/US6080330
http://ipr-pgr.com/wp-content/uploads/2016/09/ibc.pdf

Vanessa Brosten, Purchasing Agent II
Financial Management Division
N.D. Dept. of Transportation
701-328-4466

From: Todd [mailto:bloomert@aol.com]
Sent: Tuesday, November 08, 2016 9:02 AM
To: Brosten, Vanessa N. <vbrosten@nd.gov>
Subject: Re: NDDOT Ag-Based Deicer

CAUTION: This email is not from a State ND.GOV source. Only click links or open attachments you know are safe.

Vanessa
Smith Grain and fertilizer is the authorized distributor for my patented product for use in North Dakota. Should you have any questions please let me know.
Todd Bloomer

Sent from my iPhone

On Oct 7, 2016, at 12:27 PM, Brosten, Vanessa N. <vbrosten@nd.gov> wrote:

> Hello,
>
> I'm reaching out again to try to get information on vendors that can supply North Dakota with Ag-Based Deicer for the winter season. Our State Procurement Office (SPO) would like to see something from you confirming that there is only 1 vendor available.
>
> Max, if you can provide something for me to forward on to SPO, from Natural Alternatives, LLC stating you are the sole provider, that would be beneficial as well.
>
> Our districts are in demand for this and need to place orders very soon.

Thank you.

Vanessa Brosten, Purchasing Agent II
Financial Management Division
N.D. Dept. of Transportation
701-328-4466

From: Brosten, Vanessa N.
Sent: Tuesday, October 04, 2016 10:17 AM
To: 'bloomert@aol.com' <bloomert@aol.com>
Subject: FW: Ag-Based Deicer

Good Morning Mr. Bloomer,

Have you had a chance to review my email below? I have not received the requested information from you. I would like to move forward with cancelling our current contract so we can purchase deicer for our upcoming winter season.

Thank you for your time.

Vanessa Brosten, Purchasing Agent II
Financial Management Division
N.D. Dept. of Transportation
701-328-4466

From: Brosten, Vanessa N.
Sent: Thursday, September 29, 2016 4:18 PM
To: 'bloomert@aol.com' <bloomert@aol.com>
Subject: Ag-Based Deicer

Good Afternoon Mr. Bloomer,

It was nice speaking with you this afternoon.

NDDOT is currently under contract with Prairie Supply for ag-based liquid deicer. Can you please provide me information on the 330 patent and who is licensed to sell in North Dakota?

Thank you,

Vanessa Brosten, Purchasing Agent II
Financial Management Division
N.D. Dept. of Transportation
701-328-4466

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Anti-freezing and deicing composition and method

US 6080330 A

Publication number	US6080330 A
Publication type	Grant
Application number	US 09/333,180
Publication date	Jun 27, 2000
Filing date	Jun 14, 1999
Priority date ⓘ	Jun 14, 1999
Fee status ⓘ	Paid
Inventors	Todd A. Bloomer
Original Assignee	Bloomer; Todd A
Export Citation	BiBTeX, EndNote, RefMan

Patent Citations (5), Non-Patent Citations (2), Referenced by (120), Classifications (5), Legal Events (13)

External Links: USPTO, USPTO Assignment, Espacenet

ABSTRACT

A composition is proposed for use in preventing the formation of ice or snow on outdoor surfaces, such as roadways or aggregate stockpiles, and also for deicing surfaces upon which snow or ice has formed. The composition is formed from a waste product of the process of removing sugar from sugar beet molasses, also known as desugared sugar beet molasses. As a byproduct of a widely used process for making edible sugar, the desugared sugar beet molasses is readily available at a low cost. Moreover, the composition is ready for use in conventional spraying equipment without the need for mixing agents, is environmentally friendly, and is able to perform at temperatures well below the freezing point of water. The composition is also non-corrosive and can be admixed with chloride salts, such as magnesium, calcium, or sodium chloride, to reduce the corrosiveness of the resulting solution while still providing effective deicing activity.

IMAGES (7)

DESCRIPTION

This application claims the benefit of provisional application Ser. No. 60/121,389, filed Feb. 24, 1999, entitled "Anti-freezing and Deicing Composition and Method.

TECHNICAL FIELD

The present invention relates generally to a composition and related method for preventing the accumulation of snow or ice on a surface or object and/or the

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Many compounds are known as being helpful in removing snow and ice from surfaces, such as roadways or aggregate stockpiles of sand, gravel and coal, or to prevent ice and snow from forming on such surfaces. Of course, the compounds most prevalently used in the past were common types of chloride salts, such as calcium, magnesium, or sodium chloride. These compounds have long been accepted as the most efficient and cost effective manner of preventing the accumulation of snow and ice, or deicing surfaces upon which snow or ice has accumulated. However, there are several well-recognized limitations and detrimental effects resulting from the use of chloride salts.

CLAIMS (10)

I claim:

1. A composition for deicing and inhibiting the formation of ice and snow on surfaces comprising from 25-99% by volume of desugared sugar beet molasses having 60-75% suspended solids and 1-75% by volume of a component selected from the group consisting of sodium formate, calcium magnesium acetate, potassium acetate, ethylene glycol, di-ethylene glycol, magnesium chloride,

2. The composition of claim 1 further including water as a carrier for purposes of spray application.

3. The composition of claim 1, wherein said chloride salts form between 10-70% by volume of said mixture.

4. The composition according to claim 1, wherein said desugared sugar beet molasses includes fructose polymers, amino acid protein polymers, carbohydrates, starches and water and has a viscosity of substantially 150 cps at -30° F.

5. A composition for deicing or inhibiting the formation of ice and snow on

One significant limitation is that chloride salts are effective as anti-freezing or deicing agents only at temperatures just below freezing, or to about 20° F. Of course, in the depths of winter, many climates in the United States frequently experience temperatures much lower than this for long periods of time. Such low temperatures will render such compounds ineffective and, thus, unsuitable for use as intended.

Additionally, the use of large amounts of chloride salts in snow or ice removal has long been recognized as being harmful to the environment. Of course, after spreading, the salts admix with the melting ice or snow. The runoff from this process can contaminate both above and below ground water supplies and harm plants or other materials that corrode or deteriorate when placed in contact with high concentrations of chloride salts.

An early proposal for overcoming these problems was made by Dr. Jeno Toth of Hungary. Legend has it that Dr. Toth observed that even at temperatures well below freezing, snow and ice did not form on outdoor surfaces near where commercial plants discharged waste products resulting from alcohol distillation processes. Thus, after experimentation, he proposed the use of these distillation byproducts as alternatives to chloride salts as anti-freezing and deicing agents. A description of his experimentation with these compounds is found in U.S. Pat. No. 4,676,918, issued Jun. 30, 1987.

Later proposals seeking to diversify from Dr. Toth's work propose the use of similar types of byproducts as anti-freezing or deicing agents. For example, U.S. Pat. Nos. 5,709,813, 5,709,812, and 5,635,101, all to Janke et al., propose the use of the waste byproducts of the wet corn milling, wine, and cheese-making processes as anti-freezing and deicing agents. While the compositions forming these byproducts serve as effective anti-freezing and deicing agents, several limitations remain.

First, many of the compositions proposed in these patents take on the consistency of "thick molasses" at low temperatures and at extremely low temperatures (e.g. below 0° F.), become thick and putty-like. In this form, the compounds can only be effectively spread onto surfaces for use if first placed in solution with water or other compounds, such as known prior art chemical deicing agents. While it is feasible to do so to form an improved anti-freezing/deicing solution, it has been observed that such a solution continues to be high in the concentration of suspended solids and, thus, tends to clog conventional spraying or spreading devices. Such clogging can result in poor or inadequate spreading over the surface/object to be treated and thus ineffective performance. Still further, significant downtime may be necessary to clean the sprayers used to apply the composition. This costly and labor intensive operation is often quite difficult when out on the job away from repair facilities and appropriate equipment for such a purpose. Further, it can be particularly detrimental when inclement weather, such as when snow storms or severe temperature drops accompanied by precipitation, are quickly approaching or ongoing.

Another difficulty is that the compositions resulting from the fermentation or cheese-making processes are often biologically reactive. Thus, if the right conditions are presented, the organisms responsible for fermentation will continue to "grow," even after application. For example, if a first layer of a fermentation byproduct containing yeast or other active cultures is applied to a roadway, and then a second application is made, air becomes entrained between these layers. With the right amount of light, heat, and moisture, the yeast will continue the fermentation process, which will yield strong odors and foam. Of course, in certain applications, such as where these compounds are used on roadways in residential neighborhoods, this unpleasant and unsightly mess my be tracked into garages and homes making these compositions totally unacceptable for use.

Finally, a frequent observation is that distillation and fermentation byproducts have an unpleasant odor. The odor is generally described as being similar to that associated with a feed lot on a farm. While this may be acceptable when such byproducts are used on rural highways or aggregate stockpiles in industrial settings, most urban residents are not accustomed to their

surfaces comprising a mixture of from 40-60% by volume of a 60-65% solids by weight desugared sugar beet molasses, from 35-45% by volume of a 30% solution by weight of magnesium chloride, and from 1-20% by volume of water.

6. A composition for deicing or inhibiting the formation of ice and snow on surfaces comprising a mixture of desugared sugar beet molasses and rock salt including from 8-10 gallons of desugared sugar beet molasses per ton of rock salt.

7. A method of preventing the accumulation of ice or snow on a surface, comprising the step of spreading a composition including 25-99% desugared sugar beet molasses and 1-75% by volume of a component selected from a group consisting of sodium formate, calcium magnesium acetate, potassium acetate, ethylene glycol, di-ethylene glycol, magnesium chloride, calcium chloride, sodium chloride, potassium chloride and mixtures thereof on said surface.

8. A method of removing ice or snow formed on a surface comprising the step of spreading a composition containing 25-99% desugared sugar beet molasses, 1-75% by volume of a component selected from the group consisting of sodium formate, calcium magnesium acetate, potassium acetate, ethylene glycol, di-ethylene glycol, magnesium chloride, calcium chloride, sodium chloride, potassium chloride and mixtures thereof and an anti-skid agent selected from a group consisting of sand, gravel, cinders, limestone aggregate, fly ash, river rock and mixtures thereof on said ice and snow ice and snow formed on said surface.

9. A method of creating a composition and using said composition for deicing or preventing the formation of ice and snow on surfaces, objects, or the like, comprising:

removing the sugar from sugar beet molasses;

mixing the byproduct resulting from the removal of sugar from sugar beet molasses with water and a chloride salt selected from a group consisting of calcium chloride, sodium chloride, potassium chloride, magnesium chloride and mixtures thereof to obtain a solution;

spreading said solution on said surfaces or objects in an effective amount to remove ice or snow formed thereon or to prevent the accumulation of ice or snow thereon.

10. A composition for deicing and inhibiting the formation of ice and snow on surfaces comprising from 25-99% by volume of desugared sugar beet molasses, 1-75% by volume of a component selected from a group consisting of sodium formate, calcium magnesium acetate, potassium acetate, ethylene glycol, di-ethylene glycol, magnesium chloride, calcium chloride, sodium chloride, potassium chloride and mixtures thereof and an anti-skid agent selected from a group consisting of sand, gravel, cinders, limestone aggregate, fly ash, river rock and thereof.

streets smelling like fermenting silage and would not be willing to accept living with this odor as a trade-off for snow and ice-free roadways.

Thus, a need is identified for an improved anti-freezing and deicing composition that overcomes the above-described limitations of the prior art. The composition would preferably be readily available at a low cost, such as is the case with byproducts of widely used commercial processes, and would be ready for use in conventional devices such as sprayers without any additional mixing or processing. The composition would be non-corrosive and preferably would also inhibit corrosion when mixed with prior art chemical anti-freezing or deicing agents. Overall, the composition would be environmentally friendly and, thus, could be applied without harming plants or contaminating the ground or surface water.

SUMMARY OF THE INVENTION

Accordingly, it is a primary objective of the present invention to provide an anti-freezing and deicing composition that is readily available at a low cost, effective at temperatures well below freezing, suitable for use in conventional sprayers or like devices without modification or additional processing, non-corrosive, biologically inert, and non-offensively smelling.

An important objective of the present invention is to provide an anti-freezing and deicing composition that is readily soluble and miscible with water and other common chemical anti-freezing or deicing agents, such as chloride salts, while retaining the desired anti-freezing and deicing properties.

An additional objective of the present invention is to provide an anti-freezing and deicing composition that is effective when admixed with anti-skid agents for use on surfaces such as roadways in anticipation of inclement weather to prevent ice and snow formation and improve traction.

Still a further objective of the present invention is to provide an anti-freezing composition that may be applied on aggregate stockpiles in anticipation of low temperatures to keep the aggregate materials from freezing together.

Another important objective of the present invention is to provide an anti-freezing and deicing composition that provides residual effects for an extended period of time following an initial application, thereby preventing any significant amount of ice or snow pack from reforming on treated surfaces.

Yet another objective of the present invention is to provide an improved method of preventing ice and snow accumulation and/or deicing and cleaning surfaces of accumulated snow and ice in a more convenient, cost effective, reliable and efficient manner.

Additional objectives, advantages and other novel features of the invention will be set forth in part in the description that follows and in part will become apparent to those skilled in the art upon examination of the following or may be learned with the practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

To achieve the foregoing and other objectives, and in accordance with the purposes of the present invention as described herein, an improved anti-freezing and deicing composition is disclosed. As will be appreciated from reviewing the description which follows, the composition provides a readily available, low-cost, non-corrosive solution to the problem of both preventing the formation of and removing ice and snow from surfaces, such as roadways, and on other objects, such as aggregate stockpiles. Advantageously, the composition of the present invention overcomes the limitations of prior art proposals by working in conventional sprayers or spreading equipment without the need for either equipment modification or additional mixing or processing, without giving off an unpleasant odor, without being biologically reactive, and without harming the environment.

The anti-freezing and deicing composition of the present invention is a waste product of the process used to remove sugar from sugar beet molasses. Normally, this byproduct, which is commonly referred to as "desugared sugar beet molasses," is used as animal feed or simply discarded after all useful sugar is removed through processes well-known in the art and described below. However, it has been discovered that the desugared sugar beet molasses is highly effective as an anti-freezing and deicing agent that is suitable for use at temperatures well below the freezing point of water, while overcoming many of the disadvantages of prior art anti-freezing or deicing agents. For example, desugared sugar beet molasses is ready for use in conventional sprayers as delivered from the manufacturer without additional processing. Moreover, the desugared sugar beet molasses is less prone to biological upset, as it contains no alcohols, or other fermentation byproducts including yeasts and any other microorganisms associated with the fermentation process. Another advantage is that the solution has a non-offensive, light chocolate odor, that makes it acceptable for use in residential settings.

In accordance with another important feature of the proposed anti-freezing and deicing composition of the present invention, the desugared sugar beet molasses is readily soluble and miscible with other types of known chemical anti-freezing or deicing

agents without affecting the basic properties thereof. Examples of such agents include sodium formate, calcium magnesium acetate, potassium acetate, ethylene glycol, di-ethylene glycol, or chloride salts, such as calcium chloride, magnesium chloride, or sodium chloride (preferably in the form of rock salt). As described further below, the desugared sugar beet molasses in solution improves the deicing properties of these prior art chemical deicers. As a result, lower concentrations of these chemical deicers are effective for their intended purpose. Consequently, the impact of these chemical deicers on the environment and any corrosive effects thereof are advantageously reduced.

It should be appreciated that the use of the term deicing connotes that the desugared sugar beet molasses is effective to remove ice and snow already accumulated on surfaces, such as concrete, pavement, aggregate stockpiles, or the like. However, it must also be appreciated that the desugared sugar beet molasses is also quite useful to prevent the formation or accumulation of snow or ice. For example, in anticipation of a storm or other type of inclement weather, the desugared sugar beet molasses can be applied to prevent snow or water from freezing on the roadways. Even if large amounts of snow or ice are deposited on the road, the composition prevents the ice from sheeting or the snow from becoming packed down, which advantageously allows road crews to remove the accumulation in an expeditious manner. A residual effect is also observed, such that surfaces where the composition is applied tend to prevent the formation of solid ice or snow pack thereon for an extended period of time following an initial application.

When using the composition of the present invention on roadways, it is also possible to admix the desugared sugar beet solution with anti-skid materials such as sand or cinders to improve traction. Of course, this can be done both when applying the solution in anticipation of a snow or ice accumulation or when the solution is used to remove ice or snow that has already accumulated on roadway surfaces or the like.

In accordance with another important aspect of the invention, the desugared sugar beet molasses composition is non-corrosive and environmentally friendly. Thus, it will not harm vehicles or other outdoor structures fabricated from typically corrosion prone metals, nor will it promote spalling or other damage to concrete or pavement. Through experimentation, it was discovered that when the desugared sugar beet molasses is mixed with typically corrosive anti-freezing and deicing compounds, such as chloride salts, the beet molasses of the present invention actually serves to reduce or eliminate the corrosiveness of the solution.

Still other objects of the present invention will become apparent to those skilled in this art from the following description wherein there is shown and described a preferred embodiment of this invention, simply by way of illustration of one of the modes best suited to carry out the invention. As it will be realized, the invention is capable of other different embodiments and its several details are capable of modification in various, obvious aspects all without departing from the invention.

DETAILED DESCRIPTION OF THE INVENTION

The anti-freezing and deicing composition of the present invention is formed using a waste product of the process for removing sugar from sugar beet molasses, also known as desugared sugar beet molasses. As is well-known in the art, sugar beets are used to produce commercial grade sugar that serves as a substitute for the often more expensive cane sugar. The older of two most widely used processes of removing sugar from sugar beets involves cleaning the beets and slicing them into thin chips. The sliced beets are then subjected to a sugar extraction process whereby hot water is passed over the beets for approximately one hour. This process removes most, but not all, of the sugar from the beets in the form of beet "juice." The beets are then pressed in screw presses to remove the remaining sugar containing juice therefrom. The juice is then subjected to a process called carbonation, where small clumps of chalk are provided in the juice to filter out any non-sugars. The chalk is then filtered from the juice, which is evaporated to form a syrup. The syrup is then boiled until sugar crystals form therein. Once the crystals form, the resulting mixture is centrifuged to separate the crystals from the remaining liquor. The crystals become commercial grade sugar; the liquor is the desugared sugar beet molasses that forms the anti-freezing and deicing composition of the present invention.

A second, more modern process for obtaining desugared sugar beet molasses, known as the Steffen process, is described in U.S. Pat. No. 5,639,319 to Daly, which proposes the use of desugared sugar beet molasses as a tire ballast. The disclosure of this patent as it relates to the production of desugared sugar beet molasses and the properties and various suppliers thereof is incorporated herein by reference. It should be appreciated that the manner of producing the desugared sugar beet molasses is not critical to the present invention, although it is observed that sugar beet molasses which is a byproduct of the Steffen process generally exhibits slightly better anti-freezing and deicing properties relative to the desugared sugar beet molasses formed using other conventional methods. However, it should be realized that both will generally serve equally well for purposes of the composition of the present invention.

Experimentation revealed that the resultant desugared sugar beet molasses from the desugaring process is an excellent anti-freezing and deicing composition that provides several benefits over known compositions previously proposed for this

purpose. The desugared sugar beet molasses is approximately 60-75% suspended solids. Thus, it can be pumped or sprayed using existing equipment without mixture with additional water or other thinners. Additionally, the desugared sugar beet molasses has a low freezing point and is flowable at low temperatures (approximately 150 cps at -30° F.). Of course, this means that it can be sprayed for application at temperatures well below freezing. Thus, the present invention is particularly useful in cold climate areas where the temperature is too low for brine solutions to effectively provide deicing. The molasses is also environmentally friendly, is not biologically reactive, and is both non-corrosive and a corrosion inhibitor.

Another advantage of the proposed composition is that it can be mixed with commercially available chemical anti-freezing or deicing agents without inhibiting the beneficial properties thereof. In the preferred embodiment, as described further below, the composition of the present invention includes from 25-99% by volume desugared sugar beet molasses and 1-75% by volume of a deicer component selected from a group consisting of sodium formate, calcium magnesium acetate, ethylene glycol, di-ethylene glycol, chloride salts (eg. magnesium chloride, calcium chloride, sodium chloride, potassium chloride) and mixtures thereof. Still, more preferably, the composition comprises about 30-70% by volume desugared sugar beet molasses and 10-70% by volume of the deicer component. While higher concentrations are possible, generally the maximum percent by weight of the deicing agents used are: sodium formate 55%, calcium magnesium acetate 50%, potassium acetate 50%, ethylene glycol 70%, di-ethylene glycol 70%, sodium chloride 35%, calcium chloride 45%, magnesium chloride 40% and potassium chloride 42%. In a particularly useful embodiment the composition comprises about 50% by volume (of a 60-65% solids by weight) desugared sugar beet molasses, about 40% by volume of a 30% solution by weight magnesium chloride and about 10% by volume added water. This solution was found in experiments to have superior flow characteristics at very low temperatures, while retaining the desirable anti-freezing and deicing characteristics of the desugared sugar beet molasses.

Another useful embodiment of the present invention is a composition comprising between substantially 60-75% of solids by weight desugared sugar beet molasses added at 8-10 gallons per ton of rock salt. Of course, water may be added to all embodiments as desired or as necessary to improve spraying performance.

Still a further advantage is that anti-skid agents can be mixed with the molasses to improve roadway traction. Examples of such anti-skid materials include sand, gravel, cinders, limestone aggregate, fly ash, river rock or the like and mixtures thereof It is contemplated that the application of such a mixture may occur prior to the inclement weather, which allows the solution to not only assist in preventing roadway freeze-overs, but also to improve roadway traction. However, it is of course within the broadest aspects of the invention for the composition of the present invention to be applied to existing patches of snow or ice to act as a deicing agent.

The following detailed examples illustrate experiments which demonstrate the improved properties and characteristics of the compositions of the present invention. Of course, these examples are provided for purposes of illustration only and are not intended to be limiting.

EXAMPLE 1

The initial objective was to determine if a solution of 70% by volume of a 60-65% solids by weight desugared sugar beets and 30% by volume of a 30% solution by weight magnesium chloride would act as a suitable deicing agent at a temperature of 2° F. on approximately 1" of snow and ice formed on a concrete sidewalk and patio. One ounce of the solution was applied per square yard using conventional sprayers. After one hour, it was observed that the solution had melted through the snow and ice completely. It was also observed that the application area doubled within fifteen minutes of application and that after the solution melted the snow and ice down to the concrete surface, it continued to move in other directions under the snow and ice layer, thereby propagating the deicing effects. No discoloring of the concrete was observed.

EXAMPLE 2

Approximately one day later, the same location treated during the experiment described in Example 1 was revisited. The temperature in the intervening period had ranged from between 8-22° F. A residual effect was observed, in that although blowing snow and ice had accumulated on top of some treated areas, the mixture prevented the snow and ice from sheeting or completely freezing. Thus, the snow and ice accumulated was easily removed from the surface by light scraping, such as using a foot, shovel, or similar object, to reveal clean pavement underneath. Again, no damage or permanent markings on the concrete were observed.

EXAMPLE 3

Two test sites were created on snow-covered concrete using (1) a pure desugared sugar beet solution containing 65% solids; and (2) a 70% by volume of 60-65% solids by weight desugared sugar beet solution mixed with 30% by volume of 30% solids by weight solution of magnesium chloride. The application rate was 1-2 ounces per square yard for both solutions on top of

3/4-1" of snow. Over the course of three hours, wherein the temperature ranged from 8-22° F., both products melted the snow. It was observed that the concrete surface has a slight slope to it, and as the mixture melted the snow, it ran down the slope and continued the melting process. It also moved uphill sightly in a circular pattern as it continued to melt the snow.

EXAMPLE 4

On concrete pavement at an ambient temperature of between 16 and 24° F., four different solutions were applied to an accumulation of between 1/4-1" of ice and snow. After twenty minutes, the results were as follows:

Applica-tionRate	Composition	Observations
1-2 oz./ sq. yd.	Desugared sugar beet molasses alone	Performed very well; melted 60-65% snow and ice and continued to solids move laterally; moved underneath surface of snow.
1-2 oz./ sq. yd.	70% desugared sugar beet molasses (60-65% solids by weight) mixed with 30% magnesium chloride (30% solids by weight)	Very good results; Improved flow and melted more from the top of the ice downward to the surface.
3 oz./5 lbs	Desugared sugar beet molasses (60-65% solids by weight) mixed with rock salt	Very good results; spread at a fast rate.
1-2 oz./ sq. yd.	40% desugared sugar beet molasses (60-65% solids by weight) mixed with 60% of a 30% solids by weight magnesium chloride and 10% water by volume	Excellent results; no solids formed in solution, which avoided clogging the spray nozzles.

It should also be noted that for several hours prior to application, the above solutions were maintained at the ambient temperature, yet no flow problems were observed using conventional sprayers.

EXAMPLE 6

The corrosiveness of the desugared sugar beet solution was tested by dipping a mild steel nail in the solution for three months. No corrosion on the nail was observed.

EXAMPLE 7

The corrosion inhibition of the desugared sugar beet solution was tested by placing mild steel nails in solutions formed of both 30% by volume of 60-65% solids by weight desugared sugar beet solution/70% by volume of a 30% solids by weight magnesium chloride and 30% by volume of a 65% solids by weight desugared sugar beet solution/70% by volume of a 32% solids by weight calcium chloride. No corrosion was observed at the end of three months.

The typical composition of the desugared sugar beet solution of the present invention is as follows:

EXAMPLE 8

3 ounces of desugared sugar beet molasses having between 60-65% suspended solid are mixed in a mixing vessel with 5 lbs of sodium chloride and spread over a surface to remove snow and ice by melting which equates to 8 gallons per ton of rock salt.

EXAMPLE 9

Sodium formate, calcium magnesium acetate, potassium acetate, ethylene glycol, di-ethylene glycol, magnesium chloride, calcium chloride, potassium chloride and any mixtures thereof are substituted for the sodium chloride in example 8.

The typical composition of the desugared sugar beet molasses of the present invention is as follows (all measurements are approximate):

Item Content	Moisture
40% Fructose Polymers	15%
Amino Acid Protein Polymers	12%
Other Carbohydrates, Starches, and Polymers	17%
Potassium	9%
Sodium	3%
Chlorine	1%
Other Ash/Calcium Oxide	3%

Other physical characteristics include:

• Weight 10.7 pounds/gallon• PH 9-10• Freezing Point <-30° F.• Boiling Point 212° F.• Viscosity 150 cps at -30° F.• Color darkbrown• Odor chocolate

The foregoing description of the anti-freezing and deicing composition of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Obvious modifications or variations are possible in light of the above teachings. For example, the desugared sugar beet molasses doesn't need to be mixed with the deicer component or anti-skid agent prior to application to the surface being treated. The desugared sugar beet molasses may be applied to the surface separately either before or after treatment of that

surface with a deicer and/or anti-skid agent of a type known in the art. The embodiment was chosen and described to provide the best illustration of the principles of the invention and its practical application to thereby enable one of ordinary skill in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. All such modifications and variations are within the scope of the invention as determined by the appended claims when interpreted in accordance with the breadth to which they are fairly, legally and equitably entitled.

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CLASSIFICATIONS

U.S. Classification	252/70, 106/13
International Classification	C09K3/18
Cooperative Classification	C09K3/185
European Classification	C09K3/18B

LEGAL EVENTS

Date	Code	Event	Description
Apr 24, 2001	CC	Certificate of correction	
Apr 22, 2003	RF	Reissue application filed	Effective date: 20020627
Nov 26, 2003	FPAY	Fee payment	Year of fee payment: 4
Jan 7, 2008	REMI	Maintenance fee reminder mailed	
May 1, 2008	FPAY	Fee payment	Year of fee payment: 8
May 1, 2008	SULP	Surcharge for late payment	Year of fee payment: 7
Jan 21, 2009	AS	Assignment	Owner name: NATURAL ALTERNATIVES, LLC, KENTUCKY Free format text: ASSIGNMENT OF ASSIGNORS INTEREST;ASSIGNOR:BLOOMER, TODD A.;REEL/FRAME:022127/0698 Effective date: 20081021
Mar 24, 2009	RR	Request for reexamination filed	Effective date: 20090123
Apr 12, 2011	RR	Request for reexamination filed	Effective date: 20110121
Jul 12, 2011	RR	Request for reexamination filed	Effective date: 20110526
Feb 6, 2012	REMI	Maintenance fee reminder mailed	
May 8, 2012	SULP	Surcharge for late payment	Year of fee payment: 11
May 8, 2012	FPAY	Fee payment	Year of fee payment: 12

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NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

IN RE: NATURAL ALTERNATIVES, LLC,
Appellant

2015-1911

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. 90/010,381, 90/011,454, 90/011,713.

Decided: August 31, 2016

STEVEN EDWARD TILLER, Whiteford, Taylor & Preston L.L.P., Baltimore, MD, argued for appellant. Also represented by GREGORY MILTON STONE.

MARY L. KELLY, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, argued for appellee Michelle K. Lee. Also represented by THOMAS W. KRAUSE, SCOTT WEIDENFELLER, AMY J. NELSON.

Before NEWMAN, CLEVENGER, and O'MALLEY, *Circuit Judges*.

O'MALLEY, *Circuit Judge*.

Natural Alternatives, LLC ("Natural") appeals the judgment of the Patent Trial and Appeal Board ("the Board") holding all claims of U.S. Patent No. 6,080,330 ("the '330 patent") invalid as obvious. For the reasons below, we *reverse*.

BACKGROUND

The '330 patent is directed to the problem of deicing road surfaces using a natural product, desugared sugar beet molasses ("DSBM").

The Patent in Suit

The claims of the '330 patent recite a composition containing as a primary ingredient DSBM used for deicing and preventing ice formation on surfaces. As noted in the '330 patent, "desugared molasses is considered a waste product," and "[t]he price of desugared molasses is less than half of that of regular molasses. '330 patent, col. 2, ll. 58-63. The inventors of the '330 patent sought to repurpose this waste product as a natural alternative to the inorganic rock salts commonly used in deicing road surfaces. Claims 1 and 6 of the '330 patent are representative, and are reproduced in full below:

> 1. A composition for deicing and inhibiting the formation of ice and snow on surfaces comprising
>
> from 25-99% by volume of desugared sugar beet molasses having 60-75% suspended solids and
>
> 1-75% by volume of a component selected from the group consisting of sodium formate, calcium magnesium acetate, potassium acetate, ethylene glycol, di- ethylene glycol, magnesium chloride, calcium chloride, sodium chloride, potassium chloride and mixtures thereof.

Id. at col. 9, ll. 6-14.

> 6. A composition for deicing or inhibiting the formation of ice and snow on surfaces comprising
>
> a mixture of
>
> desugared sugar beet molasses and
>
> rock salt
>
> including from 8-10 gallons of desugared beet molasses per ton of rock salt.

Id. at col. 9, ll. 29-33.

The '330 patent's written description explains that the claimed composition has the advantages of being more environmentally friendly, less expensive, less corrosive, and more effective (achieving lower freezing temperatures) than prior art products, such as mixtures of inorganic salts. *Id.* at col. 3 l. 51-col. 4 l. 4. The written description also notes that the claimed composition does not have the offensive odor inherent in the organic fermentation products of certain other prior art products. *Id.* Natural markets the product claimed in the '330 patent under the trademark GEOMELT®.

Two key features of the '330 patent for purposes of the present appeal are the processes for manufacturing DSBM, and, relatedly, the low sugar content of DSBM. The '330 patent teaches two methods of manufacture, namely (a) a process known as the "Steffen" process, and (b) an older, multi-step process similar to a centrifuging process. This older process involves eight steps:

> The older of two most widely used processes of removing sugar from sugar beets involves cleaning the beets and slicing them into thin chips. The sliced beets are then subject to a sugar extraction process whereby hot water is passed over the beets for approximately one (1) hour. This process removes most, but not all, of the sugar from the beets in the form of beet "juice." The beets are

> then pressed in screw presses to remove the remaining sugar containing juice therefrom. The juice is then subjected to a process called carbonation, where small clumps of chalk are provided in the juice to filter out any nonsugars. The chalk is then filtered from the juice, which has evaporated to form a syrup. The syrup is then boiled until sugar crystals form therein. Once the crystals form, the resulting mixture is centrifuged to separate the crystals from the remaining liquor. The crystals become commercial grade sugar; the liquor is the desugared sugar beet molasses that forms the anti-freezing and deicing composition of the present invention.

'330 patent, col. 5 ll. 9-27. The '330 patent discloses that DSBM made using the Steffen process "exhibits slightly better anti-freezing and deicing properties" than DSBM made by the centrifugation process. The '330 patent nonetheless teaches that DSBMs made from both processes "will generally serve equally well" in the claimed composition and "the manner of producing the [DSBM] is not critical to the present invention." *Id.* at col. 5, ll. 37-44.

Procedural Background

Univar, a licensee of the '330 patent, filed three third party requests for reexamination of the '330 patent. The examiner found a substantial new question of patentability and proceeded to merge these three reexamination proceedings on November 8, 2011. The examiner held the challenged claims invalid as obvious in view of three primary prior art references: Polish Patent No. PL 164018 B1 to Zdzislaw, published Nov. 7, 1990 ("Zdzislaw"); U.S. Patent No. 5,639,319 to Daly ("Daly"); and a journal article titled "Winter is Hell," published July 1997 in Public Works ("Public Works").

On appeal to the Board, Natural argued that Zdzislaw taught a molasses composition containing "approximately 50% of sugar," such that Zdzislaw's beet molasses is not equivalent to the '330 patent's DSBM. The Board rejected Natural's argument, finding that Zdzislaw disclosed a deicing composition having the relative amounts of DSBM and ethylene glycol recited in representative claim 1. The Board thus affirmed the examiner's rejections of claims 1-23 and 25-55 of the '330 patent as obvious in view of Zdzislaw and Daly, or in view of Zdzislaw, Daly, and Public Works. Joint Appendix ("J.A.") 24.

The Board also affirmed the examiner's rejection of representative claim 6 based on Public Works' disclosure of mixing a beet molasses product with a salt-containing mix. The Board noted that Public Works disclosed deicing mixtures containing 8 gallons of a fermented beet molasses product per ton of salt containing mix (25% road salt and 75% crushed cinders). The Board also found that Public Works discloses a composition comprising "from 13% to 100% by volume DSBM and 0% to 87% by volume of rock salt, which overlapped the ranges of the DSBM and the second component as claimed." J.A. 649.

Finally, the Board rejected Natural's objective indicia of nonobviousness, holding that Natural failed to establish a nexus between the claimed invention and industry praise for GEOMELT®. The Board found that the prior art disclosed all the advantages of GEOMELT®'s composition, and that Natural therefore had failed to establish that GEOMELT® has an advantage over the prior art.

Natural moved for rehearing of the Board's decision, but the Board denied Natural's request. J.A. 36. Natural now appeals.

DISCUSSION

Natural argues that the Board impermissibly reconstructed the claimed invention of the '330 patent from

multiple references, including Zdzislaw, Daly, and Public Works. Hindsight bias, Natural asserts, is evident in the Board's reliance on selective portions of each of these disparate references to find all of the limitations of the recited claims. The PTO responds that the Board's findings of fact are supported by substantial evidence, and the Board's conclusion of obviousness was not erroneous.

We discuss representative claims 1 and 6 of the '330 patent in turn.

Standard of Review

Obviousness is a question of law based on underlying facts. *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). The PTAB's legal conclusion of obviousness is reviewed *de novo*; its factual findings are reviewed for substantial evidence. *In re Cuozzo Speed Techs., LLC*, 793 F.3d at 1280.

Substantial evidence "means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938); *accord In re Morsa*, 713 F.3d 104, 109 (Fed. Cir. 2002).

Representative Claim 1

Natural contends that the Board and the examiner never established a *prima facie* case of obviousness because they improperly combined the Zdzislaw, Daly, and Public Works references without addressing the fundamental differences between those references and the challenged claims of the '330 patent. Natural further argues that, even if the examiner had established a *prima facie* case of obviousness, the Board's obviousness conclusion was infected by hindsight bias because the Board failed to consider the extensive objective indicia of nonobviousness in the record.

The PTO responds that the Board correctly rejected Natural's arguments on appeal and that the Board's factual findings regarding motivation to combine are due substantial deference. For the reasons below, we agree with Natural that the Board erred in concluding that the challenged claims of the '330 patent are invalid as obvious. Accordingly, we reverse the judgment of the Board.

Natural contends that Zdzislaw, the main reference relied on by the examiner and the Board, does not teach DSBM, which is expressly recited in the '330 claims as the primary starting ingredient for the claimed deicing composition. According to Natural, Zdzislaw instead teaches a beet molasses product that "contains approximately 50% of sugar." J.A. 52. Zdzislaw's molasses, Natural argues, is thus a far cry from the desugared beet molasses recited in the '330 patent. Natural emphasizes that the '330 patent teaches a process that "removes most, but not all, of the sugar from the beets in the form of beet 'juice.'" Appellant Reply Br. at 3 (quoting '330 patent at col. 3, ll. 51-57; col. 5, ll. 7-16).

In patent reexamination, it is the examiner's burden to demonstrate a *prima facie* case of obviousness. Even before Natural had any obligation to proffer any evidence supporting the validity of the '330 patent, the examiner was required to set forth sufficient facts supporting the examiner's position that the prior art disclosed the limitations of the '330 patent claims in a manner that renders the claimed invention obvious. *Kennametal, Inc. v. Ingersol Cutting Tool Co.*, 780 F.3d 1376, 1384 (Fed. Cir. 2015) (noting that the Patent Office "bears the initial burden of showing a *prima facie* case of obviousness"). Zdzislaw's teaching that the "[m]olasses contains approximately 50% of sugar" directly contradicts the '330 patent's teaching of a process that "removes most, but not all, of the sugar from the beets in the form of beet 'juice.'" *Compare* J.A. 52 (Zdzislaw) *with* '330 patent at col. 3, ll. 51-57; col. 5, ll. 7-16). Since DSBM is the primary ingredient of the

claimed invention, the discrepancy between the amount of sugar content of the beet molasses taught in Zdzislaw and the '330 patent warrants explanation.

The Board attempted to bridge the gap by citing the '330 patent's teachings that DSBM could be made through either of the two processes taught in the '330 patent: the newer "Steffen" process, or an older multi-step process. The Board concluded that the centrifuging method taught in the Zdzislaw reference must have produced DSBM, because the '330 patent taught that either of the two processes "serve equally well" for purposes of manufacturing DSBM. J.A. 13 (citing '330 patent, at col. 5, ll. 42-44). The PTO argues that the Board's finding that Zdzislaw teaches DSBM is thus supported by substantial evidence.

The Board's reasoning rests on the premise that Zdzislaw discloses a process for making DSBM that is equivalent to a process taught in the '330 patent. This reasoning, however, ignores the express teaching in Zdzislaw that the beet molasses product "contains approximately 50% of sugar." J.A. 52. Zdzislaw teaches making molasses in the traditional sugared form. Against this express teaching of the prior art, it was improper for the Board to assume, without citing evidence, that there is no material difference between the beet molasses taught in Zdzislaw, and the DSBM taught in the '330 patent or that the centrifuging process in the former must be the same as in the latter. *See Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) (requiring the consideration of "differences between the prior art and the claims at issue" in an obviousness analysis). We thus hold that substantial evidence does not support the Board's finding that Zdzislaw discloses DSBM.

Natural next notes that Daly, the second primary reference relied on by the Board, is in a different technological field than the claimed invention of the '330 patent. According to Natural, a skilled artisan would not have

found Daly to be reasonably pertinent to the problem of deicing road surfaces because Daly taught the use of DSBM as tire ballast, which serves the unrelated purpose of stabilizing and balancing tires.

The PTO responds that Daly is "reasonably pertinent" prior art because it is directed to the same problem of preventing freezing in the transportation industry, as recited in the '330 patent. Daly provides a motivation to combine, according to the Board, because it teaches that DSBM is noncorrosive, environmentally friendly, and has a very low freezing point.

The "analogous arts test" governs the question of whether a skilled artisan would have looked to an unrelated prior art reference. Under this test, "a reference is either in the field of the applicant's endeavor or is reasonably pertinent to the problem of which the inventor was concerned in order to rely on [that] reference as a basis for rejection." *In re Kahn*, 441 F.3d 977, 986-87 (Fed. Cir. 2006) (quoted with approval in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007)). Daly teaches the use of DSBM in "a wheel having a pneumatic tire filled with liquid molasses as ballast." J.A. 47. While Daly recites several of the same advantages of DSBM taught in the '330 patent, the Board ignored the fact that Daly and the '330 patent are directed to substantially different problems. Again, it was the burden of the examiner, not Natural, to set forth a *prima facie* case explaining why a person of ordinary skill in the art would have been motivated to combine references in disparate technological fields. To satisfy this burden, the Board must explain why a person of ordinary skill in the art would have found the prior art to be "reasonably pertinent to the problem of which the inventor was concerned." *Kahn*, 441 F.3d at 986-87. Here, the examiner and the Board both sought to rely on Daly without explaining how the objective of balancing and stabilizing tires using tire ballast would be

reasonably pertinent to the objective of deicing and preventing ice formation on road surfaces.

The PTO, in an attempt to salvage the Board's decision, argues that both Daly and the '330 patent are in the same general field, namely, the transportation industry. Our decision in *In re Clay*, 966 F.2d 656 (Fed. Cir. 1992) informs our analysis of whether two references in the same general industry are reasonably pertinent. In *Clay*, we held that the prior art reference "cannot be considered to be within Clay's field of endeavor merely because both relate to the petroleum industry." *Id.* at 659. Instead, the prior art was not reasonably pertinent to the claimed invention because one taught the use of a gel in "unconfined and irregular volumes," whereas the other taught the use of the gel in a static, regular container. The claimed invention in *Clay* related to storage of oil, whereas the prior art related to extraction of oil. Under such disparate conditions, the prior art could not be considered within the same field of invention. *Clay* is directly applicable to the present case, where Daly teaches the use of DSBM as ballast for the purpose of balancing tires. The '330 patent teaches, in contrast, DSBM as part of a mixture to deice road surfaces. By failing to address this difference in the objectives of the prior art and the claimed invention, the examiner failed to set forth a *prima facie* case for motivation to combine. The Board accordingly erred in adopting the examiner's analysis. We must therefore reverse the Board's judgment that the challenged claims are invalid as obvious.

Upon showing that the Board failed to establish a *prima facie* case of obviousness, Natural had no obligation to present any affirmative arguments or evidence of nonobviousness. Natural nonetheless argued in the alternative that even if the Board had established a *prima facie* case of obviousness, the Board erred in failing to consider the extensive objective indicia of nonobviousness regarding the '330 patent. In response, the PTO

argues that the Board properly discounted Natural's proffered evidence of objective indicia because Natural failed to demonstrate a nexus between such objective indicia and the innovative features of the '330 patent.

Objective indicia of nonobviousness serve precisely to "guard against slipping into use of hindsight." *Graham*, 383 U.S. at 36. Because such objective indicia help anchor abstract analyses of obviousness to actual evidence of the claimed invention's benefits over the prior art, this evidence "must always when present be considered en route to a determination of obviousness." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Objective indicia of nonobviousness is particularly useful where, as here, the examiner alleges that an ordinarily skilled artisan would have been motivated to combine prior art references across disparate fields. In this case, our observation that the Board failed to establish a *prima facie* case of obviousness is further supported by Natural's objective evidence of nonobviousness, including industry praise, commercial success, and licensing. J.A. 946-57, 1115-68. A review of the objective indicia confirms that the Board's obviousness conclusion is contradicted by unrebutted, real world evidence of nonobviousness. Natural's evidence included several letters from various municipalities approving the purchase of GEOMELT® and extolling the advantages of GEOMELT® over traditional rock salt. *See* J.A. 946-57. The evidence further encompasses no less than fourteen declarations from customers of GEOMELT®, and the declarations of two licensees of GEOMELT®. *See* J.A. 1115-68. These declarations attest to the many benefits of DSBM in lowering the freezing point of the deicing mixture, reducing corrosiveness, protecting the environment, and reducing overall cost of deicing road surfaces. *See id.*

The PTO's singular response to Natural's evidence of objective indicia is that Natural failed to demonstrate a nexus between the asserted objective indicia and the

specific advantages of the claimed invention over the prior art. Appellee Br. at 36-37 (citing *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). The PTO correctly notes that "[i]f commercial success is due to an element in the prior art, no nexus exists." *Tokai Corp. v. Easton Enterprises, Inc.*, 632 F.3d 1358, 1369 (Fed. Cir. 2011). Here, the PTO does not dispute that GEOMELT® is an embodiment of the claimed invention. Appellee Br. at 36-37. The PTO's arguments on the lack of a nexus thus rise and fall with its arguments that the claimed invention has no advantages over the prior art. As discussed above, however, the prior art merely taught the use of molasses in general, not DSBM in particular, to deice road surfaces. The PTO does not address the fact that DSBM was previously considered a waste product, but can now be used in a deicing mixture with great efficacy, low environmental impact, and high cost effectiveness. Thus, we reject the Board's conclusions regarding lack of nexus, and we conclude that the unrebutted objective indicia in the record confirm that the claimed invention would not have been obvious.

Representative Claim 6

We next address the Board's conclusion that representative claim 6 of the '330 patent would have been obvious to an ordinarily skilled artisan at the time of the invention. The primary difference between claim 6 and claim 1 of the '330 patent is that claim 6 recites a deicing composition comprising DSBM and rock salt, "including from 8-10 gallons of [DSBM] per ton of rock salt." To find this limitation disclosed, the Board relied on a combination of Zdzislaw, Daly, and Public Works. As we have already discussed Zdzislaw and Daly above, we focus here on the Public Works reference.

Public Works teaches the use of ICE BAN, a "fermentation and distillation" product. J.A. 56. The '330 patent, in contrast, expressly teaches the manufacture of DSBM

as a byproduct from the production of commercial grade sugar. J.A. 4. The '330 patent specifically disparages Public Works and teaches that Public Works' disclosed that fermentation products have various disadvantages compared to DSBM. Specifically, the '330 patent notes that fermentation products "are often biologically reactive," yielding "strong odors and foam." J.A. 35. Where "used on roadways in residential neighborhoods, this unpleasant and unsightly mess may be tracked into garages and homes making these compositions totally unacceptable for use." *Id.* The Board failed to address these differences between the fermentation product of Public Works and the DSBM taught in the '330 patent.

The Board also concluded without evidence that a person of ordinary skill in the art would have "optimized" the amounts of DSBM and road salt to achieve the claimed invention. The Board asserted that such optimization would have been obvious from the teaching in Zdzislaw that the freezing temperature, viscosity, and effectiveness of the molasses composition can be modified by adjusting the relative amounts of the constituent components in the mixture. The Board, however, never made any findings regarding the level of skill of an ordinarily skilled artisan in the field. And as noted above, Zdzislaw taught the use of sugared beet molasses, not DSBM. This difference is critical since DSBM is the primary ingredient in the claimed invention of the '330 patent. The Board could not simply assume, without explanation, that Zdzislaw was directed to the same composition. Thus, the Board erred in concluding that an ordinarily skilled artisan would have modified Public Works in view of Zdzislaw and Daly to achieve the claimed invention of the '330 patent. We therefore reverse the Board's judgment of obviousness regarding representative claim 6.

CONCLUSION

As discussed above, the Board erred in finding the challenged claims of the '330 patent invalid as obvious. Accordingly, we reverse the judgment of the Board.

REVERSED

COSTS

No costs.

CONTRACT

The parties to this contract (Contract) are the state of North Dakota, acting through its *Director of Transportation (NDDOT), hereinafter referred to as State whose address is 608 East Boulevard Avenue, Bismarck, North Dakota, and Smith Fertilizer & Grain, hereinafter referred to as the Contractor, whose address is 1650 Quebec Street, Knoxville, Iowa, 50138.*

1. SCOPE OF WORK

CONTRACTOR, in exchange for the compensation paid by NDDOT under this Contract, shall provide the following goods or services:

Agricultural Based Liquid (Beet) Deicer is to be picked up from Contractor location or delivered FOB to district location.

2. COMPENSATION

a. Contractual Amount

NDDOT shall pay for the accepted goods provided by CONTRACTOR at the rates provided in Attachment A.

The Contractual Amount is firm for the duration of the Contract and constitutes the entire compensation due CONTRACTOR for performance of its obligations under this Contract, unless amended, regardless of the difficulty, materials or equipment required, including fees, licenses, overhead, profit and all other direct and indirect costs incurred by CONTRACTOR, except as provided by an amendment to this Contract.

b. Payment

1) Payment made in accordance with this Compensation section shall constitute payment in full for the services and work performed and the deliverables and work(s) provided under this Contract and CONTRACTOR shall not receive any additional compensation hereunder.

2) Payment will normally be made within thirty days after delivery or pickup of commodities or services under this contract and receipt of a correct invoice. Failure to submit correct invoices to the appropriate NDDOT office may delay contractor payment.

3) Payment of an invoice by STATE will not prejudice STATE's right to object to or question that or any other invoice or matter in relation thereto. CONTRACTOR's invoice will be subject to reduction for amounts included in any invoice or payment made which are determined by STATE, on the basis of audits conducted in accordance with the terms of this Contract, not to constitute allowable costs. At STATE's sole discretion, all payments shall be subject to reduction for amounts equal to prior overpayments to CONTRACTOR.

4) For any amounts that are or will become due and payable to STATE by CONTRACTOR, STATE reserves the right to deduct the amount owed from payments that are or will become due and payable to CONTRACTOR under this Contract.

c. Prepayment

STATE will not make any advance payments before performance by CONTRACTOR under this Contract.

d. Payment of Taxes by STATE

STATE is not responsible for and will not pay local, state, or federal taxes. STATE sales tax exemption number is E 2001. STATE will furnish certificates of exemption upon request by the CONTRACTOR.

e. Purchasing Card

STATE may make a payment using a government credit card. CONTRACTOR will accept a government credit card without passing the processing fees for the government credit card back to STATE.

3. TERM OF CONTRACT

This Contract begins when all parties have signed, and ends on October 31, 2017.

a. No Automatic Renewal

This Contract will not automatically renew.

b. Renewal Option

STATE may renew this Contract upon satisfactory completion of the initial Contract term. STATE reserves the right to execute up to 5 options to renew this Contract under the same terms and conditions for a period of 12 months each.

4. TIME IS OF THE ESSENCE

CONTRACTOR hereby acknowledges that time is of the essence for performance under this Contract unless otherwise agreed to in writing by the parties.

5. TERMINATION

a. Termination by Mutual Agreement

This Contract may be terminated by mutual consent of both parties executed in writing.

b. Early Termination in the Public Interest

STATE is entering into this Contract for the purpose of carrying out the public policy of the State of North Dakota, as determined by its Governor, Legislative Assembly and Courts. If this Contract ceases to further the public policy of the State of North Dakota, STATE, in its sole discretion, by written notice to CONTRACTOR, may terminate this Contract in whole or in part.

c. Termination for Lack of Funding or Authority

STATE by written notice to CONTRACTOR, may terminate the whole or any part of this Contract under any of the following conditions:

1) If funding from federal, state, or other sources is not obtained and continued at levels sufficient to allow for purchase of the services or supplies in the indicated quantities or term.

2) If federal or state laws or rules are modified or interpreted in a way that the services are no longer allowable or appropriate for purchase under this Contract or are no longer eligible for the funding proposed for payments authorized by this Contract.

3) If any license, permit, or certificate required by law or rule, or by the terms of this Contract, is for any reason denied, revoked, suspended, or not renewed.

Termination of this Contract under this subsection is without prejudice to any obligations or liabilities of either party already accrued prior to termination.

d. Termination for Cause.

STATE may terminate this Contract effective upon delivery of written notice to CONTRACTOR, or any later date stated in the notice:

1) If CONTRACTOR fails to provide services required by this Contract within the time specified or any extension agreed to by STATE; or

2) If CONTRACTOR fails to perform any of the other provisions of this Contract, or so fails to pursue the work as to endanger performance of this Contract in accordance with its terms.

The rights and remedies of STATE provided in this subsection are not exclusive and are in addition to any other rights and remedies provided by law or under this Contract.

6. FORCE MAJEURE

Neither party shall be held responsible for delay or default caused by fire, riot, terrorism, acts of God or war if the event is beyond the party's reasonable control and the affected party gives notice to the other party promptly upon occurrence of the event causing the delay or default or that is reasonably expected to cause a delay or default.

7. INSURANCE

The Risk Management Appendix, attached, is hereby incorporated into and made a part of this agreement.

8. WORK PRODUCT

All work product, equipment or materials created for STATE or purchased by STATE under this Contract belong to STATE and must be immediately delivered to STATE at STATE'S request upon termination of this Contract.

9. CONFIDENTIALITY

CONTRACTOR shall not use or disclose any information it receives from STATE under this Contract that STATE has previously identified as confidential or exempt from mandatory public disclosure except as necessary to carry out the purposes of this Contract or as authorized in advance by STATE. STATE shall not disclose any information it receives from CONTRACTOR that CONTRACTOR has previously identified as confidential and that STATE determines in its sole discretion is protected from mandatory public disclosure under a specific exception to the North Dakota public records law, N.D.C.C. ch. 44 04. The duty of STATE and CONTRACTOR to maintain confidentiality of information under this section continues beyond the term of this Contract.

10. COMPLIANCE WITH PUBLIC RECORDS LAWS

CONTRACTOR understands that, in accordance with this Contract's Confidentiality clause (section 13), STATE must disclose to the public upon request any records it receives from CONTRACTOR. CONTRACTOR further understands that any records obtained or generated by CONTRACTOR under this Contract, except for records that are confidential under this Contract, may, under certain circumstances, be open to the public upon request under the North Dakota public records law. CONTRACTOR agrees to contact STATE promptly upon receiving a request for information under the public records law and to comply with STATE's instructions on how to respond to the request.

11. INDEPENDENT ENTITY

CONTRACTOR is an independent entity under this Contract and is not a STATE employee for any purpose, including the application of the Social Security Act, the Fair Labor Standards Act, the Federal Insurance Contribution Act, the North Dakota Unemployment Compensation Law and the North Dakota Workforce Safety and Insurance Act. CONTRACTOR retains sole and absolute discretion in the manner and means of carrying out CONTRACTOR'S activities and responsibilities under this Contract, except to the extent specified in this Contract.

12. ASSIGNMENT AND SUBCONTRACTS

CONTRACTOR may not assign or otherwise transfer or delegate any right or duty without STATE'S express written consent. However, CONTRACTOR may enter into subcontracts provided that any subcontract acknowledges the binding nature of this Contract and incorporates this Contract, including any attachments. CONTRACTOR is solely responsible for the performance of any subcontractor with whom CONTRACTOR contracts. CONTRACTOR does not have authority to contract for or incur obligations on behalf of STATE.

13. SPOLIATION – PRESERVATION OF EVIDENCE

CONTRACTOR shall promptly notify STATE of all potential claims that arise or result from this Contract. CONTRACTOR shall also take all reasonable steps to preserve all physical evidence and information that may be relevant to the circumstances surrounding a potential claim, while maintaining public safety, and grants to STATE the opportunity to review and inspect the evidence, including the scene of an accident.

14. MERGER AND MODIFICATION, CONFLICT IN DOCUMENTS

This Contract, including the following documents, constitutes the entire agreement between the parties. There are no understandings, agreements, or representations, oral or written, not specified within this Contract. This Contract may not be modified, supplemented or amended, in any manner, except by written agreement signed by both parties.

15. SEVERABILITY

If any term of this Contract is declared by a court having jurisdiction to be illegal or unenforceable, the validity of the remaining terms is unaffected and, if possible, the rights and obligations of the parties are to be construed and enforced as if the Contract did not contain that term.

16. APPLICABLE LAW AND VENUE

This Contract is governed by and construed in accordance with the laws of the State of North Dakota. Any action to enforce this Contract must be adjudicated exclusively in the state District Court of Burleigh County, North Dakota. Each party consents to the exclusive jurisdiction of such court and waives any claim of lack of jurisdiction or forum non conveniens.

17. ALTERNATIVE DISPUTE RESOLUTION – JURY TRIAL

STATE does not agree to any form of binding arbitration, mediation, or other forms of mandatory alternative dispute resolution. The parties have the right to enforce their rights and remedies in judicial proceedings. STATE does not waive any right to a jury trial.

18. ATTORNEY FEES

In the event a lawsuit is instituted by STATE to obtain performance due under this Contract, and STATE is the prevailing party, CONTRACTOR shall, except when prohibited by N.D.C.C. § 28 26 04, pay STATE'S reasonable attorney fees and costs in connection with the lawsuit.

19. NONDISCRIMINATION AND COMPLIANCE WITH LAWS

CONTRACTOR agrees to comply with all laws, rules, and policies, including those relating to nondiscrimination, accessibility and civil rights. CONTRACTOR agrees to timely file all required reports, make required payroll deductions, and timely pay all taxes and premiums owed, including sales and use taxes, unemployment compensation and workers' compensation premiums. CONTRACTOR shall have and keep current at all times during the term of this Contract all licenses and permits required by law.

The Appendices A and E of the Title VI Assurances, attached, are hereby incorporated into and made a part of this agreement.

20. STATE AUDIT

All records, regardless of physical form, and the accounting practices and procedures of CONTRACTOR relevant to this Contract are subject to examination by the North Dakota State Auditor, the Auditor's designee, or Federal auditors, if required. CONTRACTOR shall maintain all of these records for at least three (3) years following completion of this Contract and be able to provide them at any reasonable time. STATE, State Auditor, or Auditor's designee shall provide reasonable notice to CONTRACTOR prior to conducting examination.

21. EFFECTIVENESS OF CONTRACT

This Contract is not effective until fully executed by both parties. If no start date is specified in the Term of Contract, the most recent date of the signatures of the parties shall be deemed the Effective Date.

WITNESS:

Chad Lynch
Name (Type or Print)

11-18-16
Signature

CONTRACTOR:

Smith Fertilizer & Grain
Company Name

Max Smith
Officer's Name (Type or Print)

Max Smith
Signature

President
Title

11-18-16
Date

WITNESS:

Name (Type or Print)

Signature

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Director

Signature

Date

APPROVED as to substance by:

Division Director (Type or Print)

Signature

Date

ATTACHMENT A

Item	Quantity	Unit	Specifications	Unit Price Per Gallon	Total
1	375,000	GAL	Deicer, Agricultural Based Liquid NDDOT Tanker-load PICK-UP from vendor location Indicate PICK-UP Location: City Hillsboro State ND (375,000 Gallons is the annual all-districts-combined estimated requirement including both picked up and delivered product.)	$1.38	$517,500
2 Opt 1	Will vary by location and will be a portion of the above total	GAL	DELIVERED price per GALLON based on liquid tanker – 4,500 Gallon Estimated Minimum Order Quantity		
			Bismarck District, 218 S. Airport Road, Bismarck, ND 58504	$1.59	
			Valley City District, 1524 8th Ave. S.W. Valley City, ND 58072	$1.47	
			Devils Lake District, 316 6th Street S., Devils Lake, ND 58301	$1.49	
			Minot District, 1305 Hwy. 2 Bypass E., Minot, ND 58701	$1.59	
			Dickinson District, 1700 3rd Ave. W., Dickinson, ND 58601	$1.66	
			Grand Forks District, 1951 N. Washington, Grand Forks, ND 58208	$1.44	
			Williston District, 605 Dakota Parkway W., Williston, ND 58802	$1.70	
			Fargo District, 503 38th Street S., Fargo, ND 58103	$1.44	

Days ARO for delivery: 1-3 depending on distance

Risk Management Appendix

Supply Contracts with Private Individuals, Companies, Corporations, Etc.:

Each party agrees to assume its own liability for any and all claims of any nature including all costs, expenses and attorney's fees which may in any manner result from or arise out of this agreement.

Contractor, or Contractor's delivery agent, shall secure and keep in force during the term of this agreement, from insurance companies, government self-insurance pools or government self-retention funds authorized to do business in North Dakota, the following insurance coverages:

1) Commercial general liability and automobile liability insurance.
2) Workers compensation insurance.

Contractor shall produce certificates of insurance or copies of insurance policies upon request by the State.

When a portion of a Contract is sublet, the Contractor shall obtain insurance protection (as outlined above) to provide liability coverage to protect the Contractor and the State as a result of work undertaken by the Subcontractor. In addition, the Contractor shall ensure that any and all parties performing work under the Contract are covered by public liability insurance as outlined above. All Subcontractors performing work under the Contract are required to maintain the same scope of insurance required of the Contractor. The Contractor shall be held responsible for ensuring compliance with those requirements by all Subcontractors.

RM Consulted 2007
Revised 6-07

NDDOT
North Dakota
Department of Transportation

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPENDIX A OF THE TITLE VI ASSURANCES

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the Contractor) agrees as follows:

1. Compliance with Regulations: The Contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, the Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. Non-discrimination: The Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. Information and Reports: The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the Recipient or the Federal Highway Administration as appropriate, and will set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance: In the event of a contractor's noncompliance with the Nondiscrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

   a. withholding payments to the Contractor under the contract until the Contractor complies; and/or
   b. cancelling, terminating, or suspending a contract, in whole or in part.

6. Incorporation of Provisions: The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPENDIX E OF THE TITLE VI ASSURANCES

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the Contractor) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.P.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

North Dakota Department of Transportation

AMENDMENT TO CONTRACT NO. 50162060

Project No.

THIS AMENDMENT to the above-referenced contract is entered into by and between the State of North Dakota, acting through its Director of Transportation, hereinafter known as NDDOT, whose address is 608 East Boulevard Avenue, Bismarck, North Dakota 58505-0700, and Smith Fertilizer and Grain, hereinafter known as the Contractor, whose address is 1650 Quebec Street, Knoxville, Iowa 50138.

WHEREAS, the parties entered into a contract on November 21, 2016; and

WHEREAS, the Contractor has performed satisfactorily under the terms of the contract; and

WHEREAS, the Contractor has expressed a willingness to extend the term of the above-referenced contract for an additional twelve (12) months with a price decrease; and

NOW THEREFORE, the Contractor and NDDOT agree that the term of the contract is extended through October 31, 2018 with a state wide price of $1.43 per gallon delivered and $1.33 picked up at the plant.

All other terms and conditions of the above-referenced contract are incorporated herein by reference and remain in full force and effect.

EXECUTED the date last below signed.

WITNESS:

Stephen Leeds
NAME (TYPE OR PRINT)

SIGNATURE

To be signed by **Owner**; **Partner**; **Corp. Pres.**, **Vice Pres.**, or **other authorized Corp. Officer**. (If signed by other authorized Corp. Officer, please attach copy of Power of Attorney or other documentation showing authority to sign.)

CONTRACTOR:

Smith Fertilizer and Grain
COMPANY NAME

Max Smith
OFFICER'S NAME (TYPE OR PRINT)

SIGNATURE

President
TITLE

August 3, 2017
DATE

WITNESS:

Sondra Goebel
NAME (TYPE OR PRINT)

SIGNATURE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Thomas K Sorel
DIRECTOR (TYPE OR PRINT)

SIGNATURE

8/9/17
DATE

APPROVED as to substance by:

Brad Darr
DIVISION DIRECTOR (TYPE OR PRINT)

SIGNATURE

11-17-17
DATE

CLA 52494 (Div. 06)
L.D. Approved 5-19-00; 5-03

APPROVED as to execution this
9 day of August 2017
ATTORNEY GENERAL
By
SPECIAL ASST. ATTORNEY GENERAL

NDDOT
North Dakota
Department of Transportation

North Dakota Department of Transportation

AMENDMENT TO CONTRACT NO. 50162060

Project No.

THIS AMENDMENT to the above-referenced contract is entered into by and between the State of North Dakota, acting through its Director of Transportation, hereinafter known as NDDOT, whose address is 608 East Boulevard Avenue, Bismarck, North Dakota 58505-0700, and Smith Fertilizer and Grain, hereinafter known as the Contractor, whose address is 1650 Quebec Street, Knoxville, Iowa 50138.

WHEREAS, the parties entered into a contract on November 21, 2016; and

WHEREAS, the Contractor has performed satisfactorily under the terms of the contract; and

WHEREAS, the Contractor has expressed a willingness to extend the term of the above-referenced contract for an additional twelve (12) months; and

NOW THEREFORE, the Contractor and NDDOT agree that the term of the contract is extended through October 31, 2019.

All other terms and conditions of the above-referenced contract are incorporated herein by reference and remain in full force and effect.

EXECUTED the date last below signed.

WITNESS:

Stephen Leeds
NAME (TYPE OR PRINT)

Stephen Leeds
SIGNATURE

To be signed by **Owner**; **Partner**; **Corp. Pres.**, **Vice Pres.**, or **other authorized Corp. Officer**. (If signed by other authorized Corp. Officer, please attach copy of Power of Attorney or other documentation showing authority to sign.)

CONTRACTOR:

Smith Fertilizer and Grain
COMPANY NAME

Max Smith
OFFICER'S NAME (TYPE OR PRINT)

Max Smith
SIGNATURE

President
TITLE

10/16/18
DATE

WITNESS:

LAUREEN M. MARTIN
NAME (TYPE OR PRINT)

Laureen M Martin
SIGNATURE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Ronald J. Henke
DIRECTOR (TYPE OR PRINT)

Ronald J. Henke
SIGNATURE

10/25/18
DATE

APPROVED as to substance by:

Brad Darr
DIVISION DIRECTOR (TYPE OR PRINT)

Mike Kirsch for
SIGNATURE

10-23-18
DATE

CLA 52494 (Div. 06)
L.D. Approved 5-19-00; 5-03

APPROVED as to execution this
25th day of October 2018
ATTORNEY GENERAL
By
SPECIAL ASST. ATTORNEY GENERAL

NDDOT
North Dakota
Department of Transportation

North Dakota Department of Transportation

AMENDMENT TO CONTRACT NO. 50162060

Project No.

THIS AMENDMENT to the above-referenced contract is entered into by and between the State of North Dakota, acting through its Director of Transportation, hereinafter known as NDDOT, whose address is 608 East Boulevard Avenue, Bismarck, North Dakota 58505-0700, and Smith Fertilizer and Grain, hereinafter known as the Contractor, whose address is 1650 Quebec Street, Knoxville, Iowa 50138.

WHEREAS, the parties entered into a contract on November 21, 2016; and

WHEREAS, the Contractor has performed satisfactorily under the terms of the contract; and

WHEREAS, the Contractor has expressed a willingness to extend the term of the above-referenced contract for an additional twelve (12) months with a $.02 price increase per gallon delivered; and

NOW THEREFORE, the Contractor and NDDOT agree that the term of the contract is extended through October 31, 2020 with a state wide price of $1.45 per gallon delivered and the price per gallon picked up at plant will remain $1.33.

All other terms and conditions of the above-referenced contract are incorporated herein by reference and remain in full force and effect.

EXECUTED the date last below signed.

WITNESS:

Stephen Leeds
NAME (TYPE OR PRINT)

Stephen Leeds
SIGNATURE

To be signed by **Owner**; **Partner**; **Corp. Pres.**, **Vice Pres.**, or **other authorized Corp. Officer**. (If signed by other authorized Corp. Officer, please attach copy of Power of Attorney or other documentation showing authority to sign.)

CONTRACTOR:

Smith Fertilizer and Grain
COMPANY NAME

Max Smith
OFFICER'S NAME (TYPE OR PRINT)

Max Smith
SIGNATURE

President
TITLE

10/8/19
DATE

WITNESS:

Sondra Goebel
NAME (TYPE OR PRINT)

Sondra Goebel
SIGNATURE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

for [redacted] RONALD J. HENKE
DIRECTOR (TYPE OR PRINT)

SIGNATURE

10/21/19
DATE

APPROVED as to substance by:

Brad Darr
DIVISION DIRECTOR (TYPE OR PRINT)

Brad Darr
SIGNATURE

10-17-19
DATE

CLA 52494 (Div. 06)
L.D. Approved 5-19-00; 5-03

APPROVED as to execution this
17th day of October 20 19
ATTORNEY GENERAL
By
SPECIAL ASST. ATTORNEY GENERAL

NDDOT
North Dakota
Department of Transportation

North Dakota Department of Transportation

AMENDMENT TO CONTRACT NO. 50162060

Project No.

THIS AMENDMENT to the above-referenced contract is entered into by and between the State of North Dakota, acting through its Director of Transportation, hereinafter known as NDDOT, whose address is 608 East Boulevard Avenue, Bismarck, North Dakota 58505-0700, and Smith Fertilizer and Grain, hereinafter known as the Contractor, whose address is 1650 Quebec Street, Knoxville, Iowa 50138.

WHEREAS, the parties entered into a contract on November 21, 2016; and

WHEREAS, the Contractor has performed satisfactorily under the terms of the contract; and

WHEREAS, the Contractor has expressed a willingness to extend the term of the above-referenced contract for an additional twelve (12) months; and

NOW THEREFORE, the Contractor and NDDOT agree that the term of the contract is extended through October 31, 2021.

All other terms and conditions of the above-referenced contract are incorporated herein by reference and remain in full force and effect.

EXECUTED the date last below signed.

WITNESS:

Stephen Leeds
NAME (TYPE OR PRINT)

SIGNATURE

To be signed by **Owner; Partner; Corp. Pres., Vice Pres.**, or **other authorized Corp. Officer**. (If signed by other authorized Corp. Officer, please attach copy of Power of Attorney or other documentation showing authority to sign.)

CONTRACTOR:

Smith Fertilizer and Grain
COMPANY NAME

Max Smith
OFFICER'S NAME (TYPE OR PRINT)

Max Smith
SIGNATURE

President
TITLE

Sept 1, 2020
DATE

WITNESS:

LAUREEN M. MARTIN
NAME (TYPE OR PRINT)

Laureen M Martin
SIGNATURE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

for Ronald J. Henke
DIRECTOR (TYPE OR PRINT)

SIGNATURE

9/9/2020
DATE

WS

APPROVED as to substance by:

Brad Dan
DIVISION DIRECTOR (TYPE OR PRINT)

SIGNATURE

9-2-2020
DATE

CLA 52494 (Div. 06)
L.D. Approved 5-19-00; 5-03

APPROVED as to execution this
4th day of September 2020
ATTORNEY GENERAL
By
SPECIAL ASST. ATTORNEY GENERAL

NDDOT
North Dakota Department of Transportation