



# EPP Rapid Research

1402 Third Avenue, Suite 1420  
Seattle, Washington 98104  
Tel 206-352-2050  
Fax 206-352-2049  
[www.pprc.org](http://www.pprc.org)

## EPP Rapid Research Roadway deicers King County, WA

December 18, 2006

### Request:

A quick and easy way to improve on the purchase of de-icers.

### Key Finding

The Washington State de-icer contract is based on the Pacific Northwest Snowfighters (PNS) qualified list of products. PNS uses certain environmental criteria, but do not yet have standards for Nitrogen or Phosphorus content. States including Montana and Massachusetts have identified this shortcoming and have created more stringent environmental criteria to use in conjunction with the PNS list of products. The following products are already on the Washington State Contract. An easy way for King County to improve on environmental performance is to pass the following information onto staff that requisitions de-icers so that they can use it when they make a de-icer purchase.

### Recommendation:

- Select more environmentally preferable products from those listed on the Washington State Contract. **The following products are on the WA State contract and also meet additional environmental standards** set by Montana<sup>1</sup>, or the USDA<sup>2</sup> for the Federal Biobased Products Preferred Program (details are available in the following Case Studies).

### Washington Contract Category 1 - Corrosion Inhibited Liquid Magnesium Chloride

FreezGard Zero - CI Plus North American Salt 19 30% 7/3/2003

ICEBAN 200<sup>3</sup> Earth Friendly Chem. 8.4 26% 8/15/2002 (Meets Federal Biobased Products Preferred Program)

MeltDown - Shield LSW\* Envirotech Services Inc. 23.5 30% 10/8/2002

### Washington Contract Category 2 - Corrosion Inhibited Liquid Calcium Chloride

Geomelt C\*\* America West 18.6 32% 6/30/2005

<sup>1</sup> - Arsenic 2.0 MT WQB-7 groundwater standard

-Mercury 0.005 MT WQB-7 surface water standard

-Total Phosphorus 2,000 Reasonably Achievable Limit, VNRP

-Total Nitrogen 1,000 / 500<sup>2</sup> Reasonably Achievable Limit, VNRP, Estimated mineralization rate of N

-Pesticides/herbicides Based on WQB-7 Standard<sup>3</sup> WQB-7 ground or surface water standard

<sup>2</sup> Federal Bio Based Products Program [http://www.biobased.oce.usda.gov/fb4p/files/De-Icers\\_Industry\\_Investigation.pdf](http://www.biobased.oce.usda.gov/fb4p/files/De-Icers_Industry_Investigation.pdf)

<sup>3</sup> Note-ICEBAN 200 was formerly ICEBAN Performance Plus M

## Case Studies

1.

Diane Tordale, Chief  
Montana Department of Transportation  
Purchasing Services Bureau  
PO Box 201001  
Helena, Montana 59620-1001  
Phone: (406) 444-6365  
Fax: (406) 444-7613

The City of Missoula Montana created a guideline that is more stringent than the PNS uses.

### MISSOULA AREA LIQUID DEICER

The City of Missoula's preference is to use a deicer product that contains the least amount of any constituents which are not essential to the product's performance and which may cause contamination of soil or water, including inert or proprietary ingredients. To accommodate this request, some locations have additional requirements. Vendors bidding product for these locations MUST include test data showing that their product meets or exceeds the specifications as listed. Failure to provide this test data MAY result in disqualification of the bid for these locations.

#### Constituent Limit for Deicers

- Arsenic 2.0 MT WQB-7 groundwater standard
- Mercury 0.005 MT WQB-7 surface water standard
- Total Phosphorus 2,000 Reasonably Achievable Limit, VNRP
- Total Nitrogen 1,000 / 500<sup>2</sup> Reasonably Achievable Limit, VNRP, Estimated mineralization rate of N
- Pesticides/herbicides Based on WQB-7 Standard<sup>3</sup> WQB-7 ground or surface water standard

In most cases, the limit is based on the Montana drinking water quality or acute aquatic life standard (WQB-7 standards), whichever is lower. The limit for nitrogen and phosphorus are set even lower because they are believed to be reasonably achievable. A 100 to 1 dilution factor is applied for most parameters. This factor accounts for the dilution and attenuation of deicer from the truck to the side of the road. It was determined by comparing the chloride concentration of deicers to the chloride concentration of storm water samples collected during runoff.

The allowable amount of total nitrogen for a deicer is dependent on the form of nitrogen present in the deicer. Supplier must test for TKN, Nitrate + Nitrite as N, and Ammonia Nitrogen using methods approved by the Department. Organic nitrogen shall equal the amount of Total Kjeldahl Nitrogen (TKN) minus Ammonia Nitrogen. If 50% or more of the nitrogen present in the deicer is of the organic form, a limit of 1,000 mg/kg shall apply. If less than 50% of the nitrogen is of the organic form, a limit of 500 mg/kg shall apply.

For a product that contains an agricultural by-product, the supplier shall test for any pesticide/herbicide possibly in the deicer using test methods approved by the Department. The limit will be based on MT WQB-7 standard using a 100 to 1 dilution.

The following products from the PNS approved products list have been tested by Montana and meet or exceed the above specifications:

- FreezGard Zero – CI Plus made by North American Salt
- GeoMelt C made by America West

2.

Dmitriy Nikolayev  
Procurement Manager  
Facilities and Environmental Services  
Commonwealth of Massachusetts  
One Ashburton Place, Room 1017  
Boston, MA 02108  
Phone: 617-720-3351  
[dmitriy.nikolayev@osd.state.ma.us](mailto:dmitriy.nikolayev@osd.state.ma.us)

The State of Massachusetts also uses the PNS Guidelines, and then makes them more stringent. (See attached Request for Response For Alternative Snow and Ice Control Products)

Our program has been looking at the environmental impacts and possible specifications for deicers. Based on our analysis of the products available on the market, we found that while many of the products may offer a significant reduction in the amount of chlorides released into the environment (through using chlorides other than sodium chloride, "activating" sodium chloride with other chemicals or completely replacing chlorides as active ingredients), many of the chemicals come with environmental concerns of their own.

While sodium chloride is a fairly pure chemical, a lot of the alternative deicing products may include a broad range of impurities, including heavy metals and significant concentrations of phosphorus and nitrogen. In addition, many of the smaller product manufacturers and marketers may have difficulty supplying products with consistent chemical composition, because the organics they get as byproducts of the food industry, for example, will vary in concentrations of copper, zinc and other metals batch to batch.

This is not to say that there are no good alternative deicing products out there. Those products definitely exist. At the same time, the fact that a product has a lower chloride concentration or has "all natural" components in it does not make it green.

I would suggest using the chemical specifications established by the Pacific Northwest Snowfighters (PNS) Association as the minimum standard for the deicing chemicals that you are buying. The Association includes state departments of transportation from Washington, Montana, Idaho and others. Here is the link to their website: <http://www.wsdot.wa.gov/partners/pns/>

There are a couple of issues with the standard, most notably, the limit for phosphorus (in some states it may be considered high) and the lack of a limit for nitrogen. At the same time, the standard definitely takes into account many other variables and has been successfully used by several states for many years.

The PNS standard is well known in the industry today. If you are concerned about the issues I noted above, consider setting additional, more stringent, specifications above and beyond that standard. One of the ideas we had here in MA was to set the PNS standard as a minimum specification and then mark products that comply with the set of more stringent specifications (which I will be happy to send you) with the "green" rating.

In summary, we should continue looking at deicing products and technologies and possibly agree on some

common standards to use. I think the PNS standard is an excellent starting point for anyone who is interested in buying alternative deicers.

3.

USDA recently identified the following Ice Ban products for inclusion in the Federal Biobased Products Preferred Program.

**Note: Some bio-based de-icers may not be good environmental improvements if they contain pesticide residues and/or heavy metals or increase the biological oxygen demand (BOD).**

[http://www.biobased.oce.usda.gov/fb4p/files/De-Icers\\_Industry\\_Investigation.pdf](http://www.biobased.oce.usda.gov/fb4p/files/De-Icers_Industry_Investigation.pdf)

Earth Friendly Chemicals, Inc., Jeremy Benson, Mr. Craig Phelps

Ice Ban Performance Plus

Ice Ban Ultra

Ice Ban Treated Salt

Ice Ban Summit

4.

Stacey Foreman

Stacey.Foreman@ci.portland.or.us

City of Portland uses brands of Magnesium Chloride with Hydromelt and Calcium Magnesium Acetate and additives (Cryotech CF7) if it gets really cold.