Spirit Lake East Homeowners Association, Inc.
P. O. Box 217
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Dust – What can we do???

by: Cindy Murphy – Treasurer
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We have a few options:

(The following is informally gathered information and is not meant to be the last word on the subject)

Water - We could lease or buy a used water truck, but they are expensive. Rental is $3,300 per month for a 2000 gal truck (United Rental in Spokane, 509-532-1235). It would have to be watered daily, which means buying the water at $3.00 per 1000 gal (City of Spirit Lake) and paying a driver. It would be muddy right after watering, then OK for a while, but on a hot day it would disperse quickly and we would be back to dust by the end of the day. Also tests show more grading is needed. This does not seem to be a feasible option.

(following information obtained from the internet)

Calcium Chloride - Calcium Chloride is a brine that draws moisture from the environment which acts to keep road surfaces moist. This hygroscopic property holds the dust down. In addition to controlling dust by keeping the road surface moist, the solution is keeping fines on the road.

In performance studies comparing the seven most commonly used materials, calcium chloride has been ranked first in overall performance. These carefully controlled tests measured both economics and performance. Calcium Chloride has proven to be equal to, or better than, the other materials offered.

Road Stabilization- **B**esides controlling dust and by keeping fines (200 mesh material) on the road, Calcium Chloride keeps the surface dense, hard and smooth. Freeze-thaw damage is reduced so road breakup is less likely. The aggregate and the crown remain intact which assures proper drainage and fewer potholes caused by erosion and washouts.

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Magnesium Chloride – is a naturally occurring salt compound made up of magnesium and chlorine. This compound can be found in seawater, the Great Salt Lake and the Dead Sea. Spraying gravel roads with Magnesium Chloride brine helps stabilize roads and suppress dust. Although concerns have been raised regarding the effect of Magnesium Chloride on trees and vegetation, no conclusive evidence supports those claims. Gravel roads that are left untreated may have a greater number of potholes and rough patches. Spraying with Magnesium Chloride eliminates these road problems and ultimately leads to smoother, safer roads.

PEP - An asphalt emulsion known as PEP or Penetrating Emulsion Prime is a well performing dust palliative. The water and emulsifying agent (oil) act as carriers for the tiny asphalt droplets to penetrate and fully coat the surface. The soapy emulsifier makes the water "wetter", to aid in the dispersion. As the emulsion cures, the water evaporates, leaving the asphalt to encapsulate the dust and protect the surface. The asphalt not only keeps the dust down, but actually upgrades gravel roads. With time the road will become hard, and require less application, though potholes will need to be filled. (Additional information from John Bowman – he was told that once you use an oil base you cannot put Calcium or Mag Chloride over it, even if it is re-graded, as it will just run off – and many residents have already used an oil base on our roads) (He also said the proper procedure for oil is to water the road, grade, water, then apply the oil. It also helps to compact.)

ADL200 - Emulsified Dust Suppressant - This product is a liquid in which a bituminous material is dispersed in water to form a stable liquid. Includes Asphalt & Bituminous, Anionic Emulsifier, and Water. (Works similar to PEP, but according to a resident who used it, it does not tend to stick to vehicles as much as PEP.)

Envirex 2000 – Natural substance – Tree Resin Emulsion - mixture from Ponderosa Pine and water. Environmentally friendly. Needs grading before being applied. Makes a hard layer that stabilizes the road surface.

Vendors - **Who do we use?**

These are the vendors I talked with to get information and pricing.

1. **OXFORD** – 267-2297 – Dee Dee- Bonners Ferry. They use **Calcium Chloride**. I was told it will build up and stabilize the road more with each application. There would be fewer potholes. It can be re-graded so long as there is plenty of moisture at the time and that rain will not wash it away.

Cost: 10-20 miles – 20 feet wide application - $2,217.60 per mile.
10 miles = $22,176.00 20 miles = $44,352.00

They could do 14 feet wide @ $1,552.00 per mile
or 12 feet wide @ $1,330.56 per mile

2. **Conmat** – 762-3822 – Connie -Hayden. They use **PEP** (also can use ADL200). PEP is a 50-50 oil, water mixture. Tested to be environmentally safe.

I was quoted $23,000 for 10 miles, 20' wide.

3. **Chipmaster Inc**. 687-2851 – Clif- Rathdrum. They also use **PEP**.

Cost: They did not get back to me with a price. Clif said they would like to chip seal it, but it would take many years as we could only do a very small section each year due to cost.

4. **Dave Ankrum** – 659-2466 – CDA. They use **ADL200** which is an oil base.

Cost: for 10-20 miles = $.55 per foot – 18' wide. $.55 x 5280 = $2,904.00 per mile - $29,040.00 for 10 miles - $58,080.00 for 20 miles.

5. **Lyman Dust Control** – 265-4204 – Jerry - Sandpoint. They use **Envirex 2000** made from Ponderosa Pine and water. Acts something like petroleum based products, but does not stick to your vehicle.
Normal cost is: $.70 per foot, 20' wide, but for 10 – 20 miles they will charge: $2650.00 per mile for 10 miles or more 20' wide. Less if only 14' wide.

John Bowman found that Lyman can also apply **Magnesium Chloride**.

Chart of Options- Pros & Cons

The table on the following page lists common dust suppressant product types and their advantages and disadvantages. A listing of dust suppressant product vendors is available from the Washington Department of Ecology's Hazardous Waste and Toxics Reduction Program -- to request a copy, call (360) 407-6700.

Dust Suppressants

Types and Brand Names	Performance Advantages	Performance Limitations	Environmental Considerations
Freshwater	Usually readily available, low material cost, easy to apply.	Frequent light applications may be necessary during hot, dry weather; therefore, potentially labor intensive. Over application may result in loss of traction, erosion, or points of road failure.	Minimal environmental hazard. If applied excessively, may result in tracking onto paved roadways requiring prompt cleanup. Supply may be limited in some areas.
Calcium chloride (Generically available as flakes or pellets)	Reduces evaporation rate of surface moisture 3.4 times; lowers freezing point of water to -60 degrees F (30% solution) minimizing frost heave and reducing freeze-thaw cycles; increases compacted density of road material; effectiveness retained after reblading.	Effectiveness in arid and semi-arid regions may be limited due to low relative humidity; very corrosive to aluminum alloys; slightly corrosive to steel. Solubility results in leaching during heavy precipitation. Releases heat when mixed in water.	Repeated applications and long-term use may harm adjacent and nearby vegetation. (Call the Department of Ecology at 360-407-6700 for listing of dust suppressant product vendors with additional product-specific information.)
Magnesium chloride: -DustGard -Dust-Off	Reduces evaporation rate of surface moisture 3.1 times, lowers freezing point of water to -27 degree F (22% solution) minimizing frost heave and reducing freeze-thaw cycles; increases compacted density of road material, more so than CaCl; effectiveness retained after reblading.	Effectiveness in arid and semi-arid regions may be limited due to low relative humidity; very corrosive to steel, though inhibitions can be added. Solubility results in leaching during heavy precipitation.	Repeated applications and long-term use may harm adjacent and nearby vegetation. (Call the Department of Ecology at 360-407-6700 for listing of dust suppressant product vendors with additional product-specific information.)
Lignin derivatives: -Dustac (Lignosite) -Road Binder	Greatly increases dry strength of soil; not humidity-dependent; imparts some plasticity to road surfaces; lowers freezing point of road surface and base, effectiveness retained after reblading.	High solubility results in leaching during heavy precipitation, corrosive to aluminum alloys due to acidity ($CaCO_3$ added ingredient, can neutralize acidity). Proper aggregate mix (4-8% fines) important to performance. Becomes slippery when	Lignin products have a high BOD (biological oxygen demand) in aquatic systems. Spills or runoff into surface or groundwater's may create low dissolved oxygen conditions resulting in fish kills or increases in groundwater concentrations of iron, sulfur compounds, and other pollutants. (Call the

		wet, brittle when dry.	Department of Ecology at 360-407-6700 for listing of dust suppressant product vendors with additional product-specific information.)
Tree Resin Emulsions: -Road Oil - Enduraseal200 (ENTAC) -Dustbinder -DustControlE (RESTAC) -Dustrol EX (J-30EX)	Low solubility after curing, minimizes leaching and provides degree of surface waterproofing. Imparts some plasticity to road surfaces. High bonding strength; non-corrosive.	Requires proper weather and time to cure. No residual effectiveness after reblading. Equipment requires prompt cleanup to avoid curing of resin in hoses and pipes.	(Call the Department of Ecology at 360-407-6700 for listing of dust suppressant product vendors with additional product-specific information.)
Synthetic Polymer Emulsions: -Soil Sement, Soil Seal -Top Seal (Dust-Seal) -ECO-CF (Sand Glue) -Soil Master WR-RSB -Aerospray 70A -Marloc	Applicable to a range of emission sources; functions well in sandy soil conditions. Some types allow seeded vegetation to grow through the polymer matrix.	Requires proper weather conditions and time to cure, may be subject to UV (sunlight) degradation; application equipment requires timely cleaning; no residual effectiveness after reblading.	(Call the Department of Ecology at 360-407-6700 for listing of dust suppressant product vendors with additional product-specific information.)
Bituments, Tars, and Resins: -Residual Fuel Oil -Technical White Oils -Fuel oils #4, #5, #6 -Asphotac -DL-10, CSS-1, CMS-2S -Arcadia oil, PEP -Pennzsuppress D	Water insoluble when dry; provides a degree of surface waterproofing. Good residual effectiveness.	Surface crusting, fracturing and potholing may develop with some of these products; long-term application of some of these products may cause road to become too hard for reblading; won't lower freezing point; petroleum oil products lack adhesive characteristics.	Use of used oils is prohibited. Some petroleum-based products may contain carcinogenic polycyclic aromatic hydrocarbons (PAHs). (Call the Department of Ecology at 360-407-6700 for listing of dust suppressant product vendors with additional product-specific information.)
Geotextiles: -Trevira Spunbond -Amoco	Flexible, durable, water permeable, and resists soil chemicals; reduces amount of aggregate required during initial construction; lower maintenance costs.	High material cost; material degrades in sunlight, if exposed.	None
Adapted from "Techniques for Dust Prevention and Suppression" Table 1, Dept. of Ecology Publication Number 96-433			