

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

To File: March 25, 2011

Applicant: Richard Gross
Facility Name: Clearwater Landfill
Facility Address: 1990 Clearwater Lane, Springfield, OR 97478

Phone: (541) 513-2103
SW Permit 1120

From: Hugh Gao, PE, Environmental Engineer, Project Manager

Subject: Evaluation for Beneficial Use Determination Application SW Project 5565

The applicant has requested a beneficial use determination for the use of silica fume material disposed at the landfill, as a concrete additive. The application proposes a Tier 1 designation.

Tier 1: For a beneficial use of a solid waste that does not contain hazardous substances significantly exceeding the concentration in a comparable raw material or commercial product, and that will be used in a manufactured product.

The silica fume present at this facility is in the form of ¼ to ½ inch dark gray pellets (see figure 3 of 2006 site inspection report). The size and hardness of these pellets minimizes the potential for dust generation. Currently, the owner of the site is exploring marketing the silica fume material as a cement concrete admixture. Silica fume, also known as microsilica, is a byproduct of the reduction of high-purity quartz with coal in electric furnaces in the production of silicon and ferrosilicon alloys. Silica Fume is also collected as a byproduct in the production of other silicon alloys such as ferrochromium, ferromanganese, ferromagnesium, and calcium silicon. This material is known to have physical properties that make it a good concrete additive.

The applicant has contracted with **Cementec Industries Inc.** who will use the silica fume from the landfill as a concrete additive. **Cementec Industries Inc.** is a Canadian-based company, and the head office and operations are located in Calgary, Alberta. A description of the company's website says:

General Description: **CON-Fume** silica fume is a pozzolanic material used to produce high performance concrete or mortar possessing increased strength, impermeability and durability. Silica fume reacts with the hydration products of Portland cement, forming calcium silicate hydrate gel, which enhances strength and durability by consuming weaker calcium hydroxide. **CON-Fume** silica fume has been specially developed to provide enhanced bulk material flow and handling characteristics, providing efficient bulk transportation and pneumatic unloading.

Applications: **CON-Fume** is recommended for high performance concrete and mortar applications.

According to comments from Bill Mason, Senior Hydro-geologist, "Although the applicant did not include laboratory data with the application, I am comfortable approving this use without that information. Silica fume is actually used to stabilize metals-contaminated material - so that it doesn't leach, and their decade of groundwater monitoring supports its low leachability."

In addition, there has been no water monitoring going on at the site since 2003. As stated in the 2006 inspection report, groundwater monitoring is not a condition of the permit, even if there have historically been four monitoring wells located at this site. Since site closure via waste removal is being explored, monitoring wells were inspected to determine their location and condition, to support possible decommissioning and removal.

Based on the review of the applicant provided information, and the historical environmental monitoring report, DEQ concludes that the use of silica fume material as a concrete additive will not create an adverse impact to public health or the environment. The use of silica fume material, however, should be limited to concrete additives only. Other uses of the material are subject to DEQ review and re-evaluation.

An approval of the silica fume use as a concrete additive is recommended.