



February 2013 Fact Sheet

Developing a Groundwater Cleanup Level for Sulfolane

The Alaska Department of Environmental Conservation has set the groundwater cleanup level for sulfolane at the Flint Hills Resources North Pole Refinery site at 14 parts per billion (ppb).

What is a cleanup level?

The Alaska Department of Environmental Conservation (DEC) Contaminated Sites Program oversees the cleanup of contaminated sites based on their risk to public health and the environment.

When spills and leaks contaminate the soil and/or groundwater, cleaning them up can be quite difficult, time-consuming and expensive. Even so, DEC's foremost role is protecting the health and safety of people and the environment.

Cleanup levels are the highest concentration of a hazardous substance that may be left in soil or groundwater. This is a level that will not pose a threat to the health and safety of people in contact with the contamination or to the environment itself.

Setting a cleanup level for the North Pole Refinery provides a defensible, legal basis for DEC's oversight of the cleanup at the site. It also drives the development of laboratory techniques that assist in the investigation and monitoring of the sulfolane levels and provides the basis for regulating the industry.

DEC has set the groundwater cleanup level for sulfolane at the Flint Hills Resources North Pole Refinery site at 14 parts per billion. This level is protective of all residential uses of groundwater.

How is a cleanup level set?

There are two main ways a groundwater cleanup level is set in Alaska. One way is when the level is already determined in Alaska regulation. However, there is no such regulatory cleanup level for sulfolane.

The other way a cleanup level can be set is when information on the toxicity of a chemical and the potential ways people may be exposed to the chemical is combined into a risk assessment.

A human health risk assessment is the method of determining the likelihood of harm occurring to people from exposure to contaminants at a site. Both the toxic properties of hazardous substances and the ways that people may be exposed to those substances are evaluated.

How was the sulfolane cleanup level set?

The groundwater cleanup level for sulfolane at the North Pole Refinery was set using a site-specific human health risk assessment.

Through that process, the cleanup level at the site was developed using known toxicity data about sulfolane and assumptions about potential ways people may come in contact with sulfolane now or in the future. Information on *toxicity* and *exposure* are used to develop a level in groundwater that is safe



What does 14 parts per billion look like? Fourteen parts per billion is equivalent to approximately 14 drops from an eyedropper in an Olympic-size swimming pool.

for people potentially exposed to groundwater containing some level of sulfolane.

DEC uses information from federal agencies to obtain toxicity information. The top two sources that DEC usually uses are the U.S. Environmental Pro-

Toxicity – Toxicity is evaluated by considering how harmful a chemical can be if people come in contact with it.

Exposure – Exposure measures the potential likelihood of coming in contact with sulfolane. Through the site's risk assessment, exposure to sulfolane was shown to occur primarily through drinking groundwater impacted by the chemical and from eating fruits and vegetables grown with sulfolane-impacted water.

tection Agency's (EPA's) Integrated Risk Information System (IRIS) and Provisional Peer Reviewed Toxicity Values (PPRTVs).

Since sulfolane is a newly recognized contaminant, the EPA has not yet created an IRIS toxicity value for the chemical.

The EPA set a PPRTV for the ingestion of sulfolane in 2012, after thorough review of all available toxicity data by a team of scientists. When that number is combined with information on ways that people may be exposed to sulfolane, a groundwater cleanup level can be developed.

The groundwater cleanup level recently established by the DEC is protective of human health, both in terms of drinking water, and in ensuring the groundwater is safe to use for gardening and other general purposes. DEC is confident the cleanup level of

14 parts per billion incorporates the best available toxicity data with protective assumptions regarding current and future exposure. The cleanup level provides a very protective, legal basis for cleanup at the site.



The groundwater cleanup level for sulfolane is protective of human health, including ensuring water is safe for drinking and growing fruits and vegetables.

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Information on the status of the cleanup project, current and future actions, newsletters, fact sheets and other project documents for the sulfolane investigation at the Flint Hills Refinery in North Pole can be found on the DEC website:

dec.alaska.gov/spar/csp/sites/north-pole-refinery