



What is cement kiln dust?

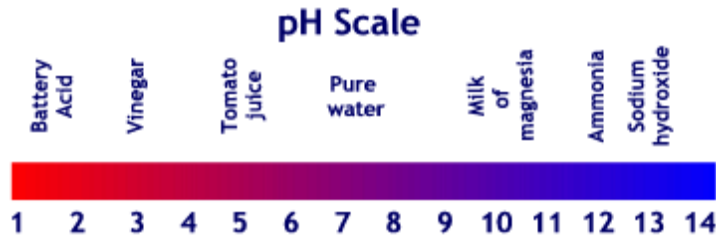
Cement kiln dust (CKD) is a leftover material or waste from cement manufacturing. Making cement involves grinding limestone with other raw materials into a fine powder. The powder is then heated in the kiln to a temperature above 1400 degrees Celsius. At this high temperature a chemical reaction occurs resulting in cement clinker. The CKD is the leftover dust and powder from this process.

Why is the cement kiln dust a concern?

Cement kiln dust is a very alkaline material and contains heavy metals. When rain, snow melt, or ground water flows through the material it raises the pH to a toxic level resulting in contaminated leachate.

What is pH?

pH is a measure of hydrogen (H+) ions, which essentially measures the acidity or alkalinity of water. The pH scale ranges from 0-14 with low values indicating greater acidity (more H+ ions), high values indicating greater alkalinity. For example, lemon juice has a pH of 2.2 which is more acidic than many soda pops that have a pH of 4. Drinking water has a pH of 7, which is neutral. The pH scale is a logarithmic scale, meaning that a pH of 6 has 10 times as many hydrogen ions and is 10 times more acidic than something with a pH 7, and a pH of 5 has 100 TIMES as many hydrogen ions as pH 7, making it 100 times more acidic.



What is contaminated leachate and where is it coming from?

Prior to the existing development at Bay Harbor, the Penn-Dixie Cement Plant operated along this five-mile stretch of Lake Michigan shoreline for over 80 years, leaving behind an estimated 2.5 million yards of cement kiln dust. Bay Harbor was built over this same area, certain sections located on top of or in close proximity to the cement kiln dust piles (principally portions of the Golf Course and East Park). Although the piles were leveled out and covered with dirt, water from precipitation, irrigation, and ground water come into contact with the kiln dust, raising their pH to often toxic levels (below 9 is considered safe for humans). pH readings have been found between 11 and 12, the highest was 13.6. The cement kiln dust also contains heavy metals such as mercury and arsenic. This contaminated water eventually makes its way to the Lake Michigan shoreline, seeping out in numerous areas.



Source: Sample sites-Bay Harbor Company
Health Advisory Information: NWMCHA



426 Bay Street
Petoskey, Michigan 49770
(231) 347-1181
www.watershedcouncil.org

How does the kiln dust and its leachate harm water quality?

Leachate degrades water quality on two levels. In near shore areas of concentrated leachate, high pH levels can cause harm or death of aquatic organisms. Most fish can not survive in waters with a pH above 10. Far from shore, dilution nullifies the pH impact from leachate, but the toxins present in the leachate, such as mercury, persist in the lake ecosystem and pose a long-term threat. Such toxins are assimilated by aquatic insects and microscopic plants and animals (plankton) on the low end of the food chain. These toxins bio-accumulate in the larger predatory fish, meaning that they build up in concentration, which then affects the health of humans consuming these fish.



What are the effects on fish and other aquatic life?

There are both short- and long-term impacts to the lake ecosystem. One of the short-term impacts is harm to fish and aquatic insects. Toxicity tests performed using contaminated water from Bay Harbor resulted in 100% mortality of minnows and daphnia. Long-term impacts are not known, but may include diminished spawning areas for fish and persistent presence of toxins.

What is being done to clean up the contamination?

Recently, an interim response workplan was submitted by CMS and accepted by EPA. Work has already begun to fence off contaminated areas that pose a risk to public health and collect contaminated seepage along the shoreline for treatment and disposal. In addition, a shoreline survey is being conducted, measuring pH at 25-foot intervals along the Bay Harbor coastline, to identify all areas where contaminated leachate is seeping into Lake Michigan. CMS and EPA continue to move forward with negotiations to develop a complete workplan that will provide a long-term solution to effectively control this pollution source to the Bay.

What is the Watershed Council doing?

The Watershed Council wants to insure that the clean-up is done properly and thoroughly. The Watershed Council wants the contamination from the site to be cleaned up using the best available technology. We want the clean up to be thorough, so we support doing additional studies to understand the problems. The remediation solutions should be designed to address the problem permanently. Once the workplan is final we recommend an expedited clean up.

We are doing the following:

- Communicating with the involved parties on a regular basis (EPA, DEQ, Northwest Michigan Community Health Agency, Little Traverse Bay Band of Odawa, CMS, Bay Harbor, Boyne U.S.A.) to understand the issue.
- Informing the public and our members about progress on the clean up.
- Sharing the facts about the contamination and the impacts on water quality.
- Implementing and updating the Little Traverse Bay Watershed Protection Plan to address other pollutant sources to Little Traverse Bay.
- Visit our website for additional information and updates at www.watershedcouncil.org and to find a staff directory.

What can I do?

Stay informed about what is going on.
Request updates from the Watershed Council.
Express your opinion to the parties involved in the situation.



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