Neighborhood Update

Madison Kipp Corporation Investigation & Cleanup
Wisconsin Department of Natural Resources (DNR)

Date: 06/09/2014

*To keep the neighborhood well advised of progress in the investigation and cleanup at the Madison Kipp Corporation Property, DNR will release updates directly to neighbors through the DNR's website (*dnr.wi.gov, search: "Kipp") *and through this e-newsletter system. DNR will make efforts to notify property owners and tenants, in advance, when specific data is released that references their property or an adjacent location.*

Update on MKC subsurface building investigation

As mentioned in Neighborhood Update – 1/15/14, Arcadis began performing additional soil sampling beneath the MKC factory floor during a December 2013 shutdown of the plant. The purpose of this additional testing was to delineate the extent of polychlorinated biphenyl (PCB) and volatile organic compounds (VOC) contamination underneath the factory.

Between December 2013 and February 2014 a total of 27 soil borings were advanced beneath the main factory's footprint, at locations chosen under the direction of both DNR and the U.S. Environmental Protection Agency (EPA). As many as three soil samples were collected per boring at varying depths above the water table or where refusal was encountered. The samples were laboratory tested for a variety of VOCs and PCBs.

Concerning VOCs, only one of the samples collected, B-190 from 0 to 2 feet below land surface, exceeded the industrial direct contact residual contaminant levels (RCLs) for tetrachloroethene (PCE) which was detected at 2,400 milligrams per kilogram (mg/kg) and trichloroethene (TCE) which was detected at 150 mg/kg. The boring is located in the north parking lot and will be managed using the paved parking lot as an engineered barrier.

Concerning PCBs, 26 of the 72 samples contained PCBs above 1 mg/kg and 15 samples were detected above 50 mg/kg. Soils contaminated with PCBs above 50 mg/kg need to be disposed in special landfills approved to accept PCB-contaminated wastes. These locations are presented on Figure 2 of the report. The highest PCB concentrations are located adjacent to the historical concrete trench located in the middle of the facility, running north to south. DNR and EPA are working together to determine an appropriate response action to the documented PCB contamination beneath the building.

Click here, to view the report.

PCE Plume Evaluation

With a large system of groundwater monitoring wells now in place to collect data concerning the tetrachloroethene (PCE) plume, Arcadis has chosen to analyze the large amount of data that has been generated by these wells to evaluate the plume's stability and its ultimate fate. In their report, *Evaluation of Plume Stability and Fate and Transport Modeling for PCE in Bedrock Groundwater*, a statistical analysis of current and past groundwater data collected from the site is analyzed to determine the plume's stability. In addition, a mathematical model was used to simulate the fate and transport of the PCE plume in order to forecast its movements and create a quantitative framework in which to view the groundwater data.

The collated sampling data was charted and statistically analyzed first to verify its statistical significance, to ensure that the data was accurate and fit to be used. Results show that 12 of 22 monitoring wells tested had a sufficient amount of data to support quantitative statistical analysis and, of those, seven showed statistically significant evidence of decreasing PCE concentration trends over time.

For the remaining five monitoring wells with a sufficient amount of data for quantitative analysis there is a clear decreasing or stable PCE concentration trend over time, but too much scatter in the data to be statistically significant. The one exception was MW-4S which had a sufficient amount of data to support quantitative statistical analysis, but showed an increasing trend that was statistically insignificant.

The analysis also includes an examination of how the geologic conditions have affected the plume's shape, movement and stability. The position of unit well 8 is also discussed in respect to the PCE plume.

The second half of the report covers the use of a mathematical model to determine the fate and transport of the PCE plume. The model simulates the many processes that act upon the plume: groundwater flow in bedrock fractures, dispersion, molecular diffusion in bedrock matrix blocks (also known as matrix diffusion), hydrophobic sorption, and chemical degradation due to both biotic and abiotic degradation processes. The report discusses the two most influential processes, matrix diffusion and degradation, in detail.

The computer model was adjusted to mimic the specific conditions found at the site. These parameters were collected from previous site investigation work or scientific literature; two parameters were estimated during model calibration, matrix tortuosity and PCE degradation rate. When the model was run these two values were adjusted until modeled PCE concentrations were consistent with measured concentrations, thereby indicating an accurate model was achieved.

Once completed, the model was shown to simulate the PCE transport in bedrock beneath the site. In addition, the estimated numbers that were finally used in the model were found to be realistic and within the range of published literature values.

When the model is run it shows the PCE plume stabilizing after 45 years, this is consistent with the real data that shows a now stable plume after an estimated 48 years since release from the MKC property. The model was also run 5, 10 and 20 years into the future. Results showed that the plume should not migrate, suggesting that the Unit Well 8 should not be impacted.

Click here, to view the report.

Click here, to view the most recent groundwater sampling data.

Residential Backyard Work

Starting June 6th, contractors on behalf of MKC will begin working in the backyards of some homes on Waubesa and Marquette Streets under the terms of the legal settlement that was reached between MKC and certain adjacent homeowners.

Rain Garden Update

Excavation and confirmation sampling have been completed; a report on the excavation is forthcoming. As noted in the neighborhood update from January 23, 2014, City of Madison staff and/or city contractors will complete the re-planting and establishment of rain garden vegetation.

Additional Resources

Where Can I Find More Information?

Website:	dnr.wi.gov: Search “Kipp”
Public Document Repository:	Hawthorne Public Library Information Desk *For hours and contact information visit* www.madisonpubliclibrary.org/hawthorne, 608-246-4548

Whom Can I Contact to Ask a Question or Make a Comment?

DNR Soil/Groundwater Cleanup & General Community Concerns:	Linda Hanefeld, WDNR Team Supervisor 608.275.3310, linda.hanefeld@wisconsin.gov
Health Effects of Contamination:	John Hausbeck, Public Health – Madison & Dane Co. 608.243.0331, jhausbeck@publichealthmdc.com