

## **Municipal Water Extension to Green Bay Road Village of Grafton, Lime Kiln Park Project**

### **Introduction/Site History**

- Municipal water was supplied to Green Bay Road residences during 1997 and 1998, two years after sampling was initiated by the WDNR and EPA (**P. 2-3**)
- WDNR and EPA required that the Village water main be extended to Green Bay Road residents due to unsafe drinking water (**P. 2-2**)
- Necessary due to compounds detected in drinking water during WDNR and EPA sampling (**Supplemental pages**)
- WDNR believed that Freon 113 represented the leading edge of the plume, since it is a highly mobile compound (**Personal contact; Chad Czarkowski**)
- TCE was detected above drinking water standards along Green bay Road (**Supplemental Pages**)
- Due to the lack of knowledge of subsurface conditions, the safest route was to extend water to private residences

### **Lime Kiln Park Landfill Investigation**

- Begun at the request of the WDNR to investigate the landfill as a potential source of groundwater contamination (**P. 2-3**)
- The initial investigation focused on determining the geology, groundwater flow characteristics, background water quality, contaminants of concern and possible contamination migration pathways (**PP 2-4 to 2-5**)

### **Investigation Results**

- The investigation found that the geology was fairly consistent to a depth of 200 feet (**P. 5-5, fig 5**)
- The investigation found that vinyl chloride, among other compounds, was present in the landfill (**Table 6**)
- The investigation found no 1,1,1 TCA or Freon 113 in the landfill, which were detected along Green Bay Road amongst other compounds (**Table 6**)
- The investigation found that the groundwater flow direction is to the southeast (**Figure 8**)
- Well 3B, between the two plumes, is free of detects from either plume (**3B Results**)
- Upgradient of the Milwaukee Sign property, Freon 113 and 1,1,1 TCA were not detected (**6B results**)
- Freon 113 was detected in Municipal Well No. 6

### **Conclusions**

- Two plumes can be delineated based upon marker compounds Freon 113 (West Plume) and Vinyl Chloride (Lime Kiln Plume) (**Figure 8**)
- Groundwater flow controls the flow of compounds from the various sources (**Figure 8**)
- The Lime Kiln Park Landfill is not the source of contamination along Green Bay Road (**Figure 8**)
- EPA required extension of the water main based upon the compounds detected, and the unknown sources and unknown subsurface conditions

**Earth Tech responses to April 26, 1999 correspondence from Raymond Rhoder to Buck Sweeney, regarding the Lime Kiln Plume and West Plume identification.**

1. TCE is associated with the West Plume. It has been detected within that Plume, which is upgradient of Lime Kiln Park. TCE was detected directly downgradient of the Milwaukee sign property (well P5B), and was not detected directly upgradient of the property (well P6B). TCE detected in the West Plume is not from the Landfill due to the groundwater gradient and the absence of marker compounds found within the Lime kiln Plume.
2. 1,1,1 TCA was not detected in the Lime Kiln Landfill leachate. It was detected in a very small concentration in landfill gas, at concentrations that are not indicative of groundwater contamination at the levels seen in the area. 1,1,1 TCA may be present in landfill because the landfill is near the east edge of the West Plume. 1,1,1 TCA was identified in several wells (P1B and C, P5B, PW760GB, PW740GB) upgradient of Lime Kiln Park, downgradient of the Milwaukee Sign property. 1,1,1 TCA was detected in wells downgradient of both the Milwaukee sign property and the Lime Kiln Park. 1,1,1 TCA was not used as a marker to determine the extent of the West Plume, since Freon 113 is found in all wells within the West Plume. TCE is not a unique marker compound to the Lime Kiln Plume.
3. To be addressed by Buck Sweeney.
4. TCE and vinyl chloride were the driving factors to replacing the water supply to residents in that they were the compounds detected above regulatory standards. Vinyl chloride is associated with the Lime Kiln Plume, and is only found directly downgradient of the plume. TCE is detected in wells along Green Bay Road, which could not have been effected by the landfill, due to the steep groundwater gradient shown on Figure 8 of the Earth Tech (Rust) report. Freon was a factor in determining the extent of the new water main, in that the WDNR believed that Freon detects along Green Bay Road were indicative of the leading edge of a plume, since Freon is highly mobile.
5. The "northerly vector" of groundwater flow was created by pumping at Village well No. 2. Impacted water was pulled toward that well during increased pumping, and the compounds migrated to the southeast from that location. Freon 113 was not detected in well P6B, located directly upgradient of the Milwaukee Sign property. **Earth Tech has not investigated other potential Freon 113 sources in the Lime Kiln Park area.**
6. To be addressed by Buck Sweeney.
7. To be addressed by Buck Sweeney.
8. To be addressed by Buck Sweeney.
9. To be addressed by Buck Sweeney.