

**Responses to Questions Regarding the Highway 96 Dump Superfund Site
From the April 2009 North Oaks City Council Meeting**

**Prepared by Wenck Associates
May 12, 2009**

At the April 2009 City Council Meeting, Keith Benker of Wenck Associates presented an update on the status of activities related to the Highway 96 Dump Superfund Site. There was considerable discussion among the City Council, as well as with concerned residents in attendance. Several questions or issues of concern were identified. Mr. Benker was directed to talk with the Minnesota Pollution Control Agency (MPCA) and Conestoga-Rovers & Associates (CRA), the consultant working on behalf of the Responsible Parties, to get additional information in order to respond to the questions and issues.

1. Regarding the construction of replacement wells for 13 West Shore Road and 2 Hummingbird Hill, it was noted that both homeowners asked to have the replacement well drilled deeper into the Jordan Sandstone, versus the Prairie du Chien aquifer as was specified in the Minnesota Decision Document Amendment (MDD Amendment). The homeowners agreed to pay the cost difference. There was a question as to what the differences were in depth and cost?

Response: Based on information from CRA, the Jordan wells were about 120 feet deeper and cost an additional \$2,000 - \$3,000.

2. There was discussion regarding the MDD Amendment requirement to install three new monitoring wells angled to extend out below Gilfillan Lake, and the lack of success to-date in obtaining access agreements from property owners on the west shore of the lake. It was noted that the Responsible Parties intend to send a letter to the MPCA regarding this subject.
 - a. It was asked what the content of the letter will be?

Response: The Responsible Parties are still preparing the letter. The letter will summarize their efforts to-date in attempting to secure access agreements for installation of the wells. It is not known what the letter will recommend as the next step.

- b. It was asked if the wells have to be installed from the west shore versus from some other location around the lake?

Response: To have the intake of the wells be located in the approximate locations shown on Figure 4.1 in the Feasibility Study, the wells need to be installed from the west shore. Locations on the east shore were explored during preparation of the Feasibility Study, in particular shoreline property owned by NOHOA near the

intersection of Gilfillan Road and Dove Lane; however, the distances are too great for available drilling technology. Angle borings only have a horizontal range of approximately 225 – 300 feet. The distance from the eastern shoreline to even the center of the lake is approximately 1,000 feet.

- c. Several similar questions were posed getting at a central issue of possible alternatives, and why angled wells were selected?

Response: CRA researched a number of scenarios for drilling monitoring wells under Gilfillan Lake. The scenarios researched and conclusions drawn were the following:

- **Driving a drill rig onto the lake during winter conditions to drill a well.**

CRA contacted experienced drilling contractors to obtain logistical information about this scenario. The contractors noted that the ice thickness of Gilfillan Lake (the maximum thickness is 24-inches under extreme cold weather conditions) would not support the combined weight of the drill rig and the added downward pressure generated during drilling.

- **Floating a drill rig onto the lake during summer (thawed) conditions to drill a well.**

CRA also contacted experienced drilling contractors to obtain logistical information about this scenario. The contractors noted that because of the size of the drill rig that would be required and the shallow nature of Gilfillan Lake (the maximum depth is approximately 9 feet), it is unlikely that any barge used to “float” the drill rig could be pulled or maneuvered through the lake.

- **Using angle drilling methods to drill monitoring wells from the shoreline.**

On the basis of information obtained from experienced drilling contractors, CRA concluded that this method of drilling wells to monitor groundwater under the lake is practicable, and CRA proposed it in letters to the MPCA dated September 25, 2007 and October 25, 2007. The MPCA subsequently approved those proposals on October 11, 2007 and November 7, 2007, respectively. As noted in the response to Item #2b above, there is a limitation on the distance for angle drilling; hence, the wells need to be drilled from the west shoreline to reach the proposed locations.

3. There was discussion of the groundwater extraction system located in Ski Lane ravine. Operation of the system is a contingency action (required by the MDD Amendment) that would be triggered by increased concentrations of contaminants in nearby monitoring wells. It was noted that a final decision has not been made of what to do with the extracted groundwater after treatment. Two options considered in the Feasibility Study were discharge to an infiltration basin located in Ski Lane ravine, or discharge to Gilfillan Lake. Concerns were raised about the time it would take to get final approvals, complete construction, and begin operation of the groundwater extraction system.

Response: CRA estimates that it would take 6-12 months to perform additional design studies, obtain the necessary approvals, complete construction, and have a fully operational extraction system. The system would consist of two extraction wells, a new upper St. Peter well to go along with the existing lower St. Peter well. An aeration-type treatment system would be constructed in a manhole near the extraction wells to remove the contaminant(s) to approved levels for discharge. Discharge of the treated water to an infiltration basin in Ski Lane ravine is considered the preferred method for disposal of the water because the Responsible Parties already have an access agreement with the North Oaks Home Owners' Association (NOHOA). Construction of a discharge line to Gilfillan Lake would likely require having to obtain access agreements from multiple property owners, unless the line can be considered a "utility" that could fall under an easement with NOHOA. Additional design studies would include an aquifer pumping test on the new well, delineation of the wetland in Ski Lane ravine, and conducting an infiltration rate test. Approvals would be needed for construction of the new well, for pumping, and for discharge to the infiltration basin, or alternatively, for discharge to Gilfillan Lake. As noted above construction of the discharge line could involve the need for access agreements or easement rights. CRA believes that the timeframe of 6-12 months is acceptable because the groundwater in the vicinity of Ski Lane ravine would not migrate beyond the capture zone of the extraction system during this time. [Keith Benker comment: While I generally agree with CRA's position, it perhaps would be worthwhile to explore resolving some of the potential issues now. While it is unknown if operation of the extraction system will ever be triggered, some of the issues to be resolved would involve relatively low expense, especially in light of the investment already made by the Responsible Parties with respect to the extraction system (i.e., the existing extraction well, monitoring wells, and the pump test performed). Further discussions with NOHOA and/or the City and/or residents in regard to access or easements would be relatively inexpensive and could be the most time-consuming activity to get the system operational. It would be helpful to have pre-approved agreements. Also, the wetland delineation and an infiltration test would be relatively low cost and would answer questions about the ability to use an infiltration basin. I suggest further discussion of this matter.]

4. It was asked, what is the typical cost of monitoring wells like those installed in Ski Lane ravine?

Response: Based on information from CRA, the cost to install a monitoring well into the upper St. Peter Sandstone in Ski Lane ravine is approximately \$9,000. The cost varies primarily with depth.

5. There was discussion of the remediation being conducted at/near the dump site proper, including the groundwater extraction system. Questions were asked regarding what measures are (or could) be taken to provide assurance to the City and its residents on the effectiveness of the groundwater extraction system, and measures to maintain that effectiveness into the future.

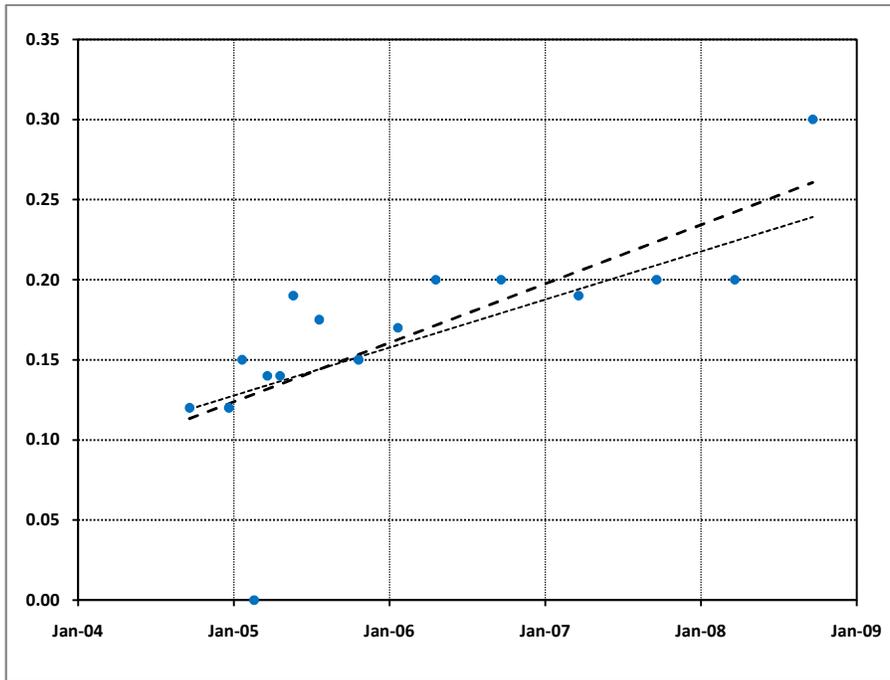
Response: Reiterating what was said at the April City Council meeting, the best proof for demonstrating the effectiveness of the groundwater extraction system is the absence of contamination in the compliance monitoring wells located near the extraction system. The absence of contamination in these wells shows that the extraction system has “cut off” the flow or migration of contamination from the dump. A second line of evidence is looking at water levels that are measured in the extraction wells and monitoring wells. If the extraction system is working properly, the measurements should show that the contaminated groundwater from the dump is flowing towards the extraction wells. A third line of evidence that the system is functioning properly is to look at the maintenance records to verify that there have not been any significant down times. All three of these lines of evidence are presented in the Annual Monitoring Reports that are prepared by CRA, and reviewed and approved by the MPCA. Keith Benker (Wenck) spoke with Fred Campbell (MPCA) and was told that based on their review of the 2008 Annual Performance Report, the MPCA is satisfied with the effectiveness of the extraction system. If the MPCA were to have concerns in the future, they would require the Responsible Parties and CRA to correct the situation. It is also worth noting that CRA inspects the groundwater extraction system on a weekly basis to ensure proper operation, and performs routine maintenance to prevent issues such as fouling of the wells by iron bacteria.

6. Jeff Apland, North Oaks resident, commented that the MPCA justifies the monitoring and remediation plans outlined in the MDD Amendment with the contention that, “After three and half years of intensified ground water monitoring by the Responsible Parties, there has been no indication of an increasing plume size or increasing vinyl chloride concentrations.” Mr. Apland presented a graph (Attachment 1) showing vinyl chloride data collected at 12 West Shore Road and asked, can the MPCA honestly say "there has been no indication of . . . increasing vinyl chloride concentrations?"

Response: The MPCA staff reviewed the summary chart submitted by Mr. Apland, and provided the following comments:

- 1. The graph only shows the data for one residential well (12 West Shore Rd), whereas the accompanying statement, taken from the Amendment to the Minnesota Decision Document was general in scope, and did not refer to one specific monitoring or residential well.**
- 2. If the data for all four vinyl chloride-contaminated wells on the west side of Gilfillan Lake (12 West Shore Rd, 13 West Shore Rd, 15 West Shore Rd, 2 Hummingbird Hill) are plotted on a similar chart (Attachment 2), there is no apparent increase in vinyl chloride concentrations.**
- 3. The MPCA acknowledges that the vinyl chloride concentrations in the residential well at 12 West Shore Rd appear to trend upward (see chart 2 in Attachment 2). In contrast, the vinyl chloride concentrations in the residential well at 2 Hummingbird Hill appear to trend downward (see chart 2 in Attachment 2). Thus, these apparent trends for individual wells should not be considered in isolation. Rather, it is more important to consider not only the results for all four vinyl chloride-contaminated wells, but the results for all sampled residential- and monitoring wells.**
- 4. The graph presented by Mr. Apland includes data from two different laboratories [Interpoll and Minnesota Department of Health (MDH)]. These two laboratories used different reporting and detection limits, which could potentially make it more difficult to compare or combine data.**
- 5. Since the residential well data for the Site are one of the measures used to evaluate potential risk to human health and welfare, they are ultimately compared with the MDH Health Risk Limit (HRL). However, it is important to remember that the additivity of two or more compounds may be significant in this context. For example, MDH issued a well advisory for the residential well at 13 West Shore Rd because of the additivity of two compounds (vinyl chloride and chloroform). Therefore, the data for a single contaminant may not represent the total potential human health risk.**
- 6. The MDD Amendment quote that accompanies the graph presented by Mr. Apland mentions two properties of the groundwater contamination plume: the extent (size) and magnitude (vinyl chloride concentrations). When evaluating potential risk at the Site, it is important to consider both properties of the plume, rather than emphasizing one property over the other.**

In summary, the MPCA believes that the collective residential well data (October 2004 - August 2008) do not show increasing vinyl chloride concentrations within the plume on the west side of Gilfillan Lake. However, the MPCA acknowledges that small-scale vinyl chloride increases (e.g., 12 West Shore Rd) and decreases (e.g., 2 Hummingbird Hill) may be present in the individual well data.



"After three and a half years of intensified ground water monitoring by the RP's, there has been no indication of an increasing plume size or increasing vinyl chloride concentrations."

MDD Amendment, page 7.

Chart 1 - Hwy 96 Dump Site, Residential Well Data (2004-2008), West Gilfillan Lake

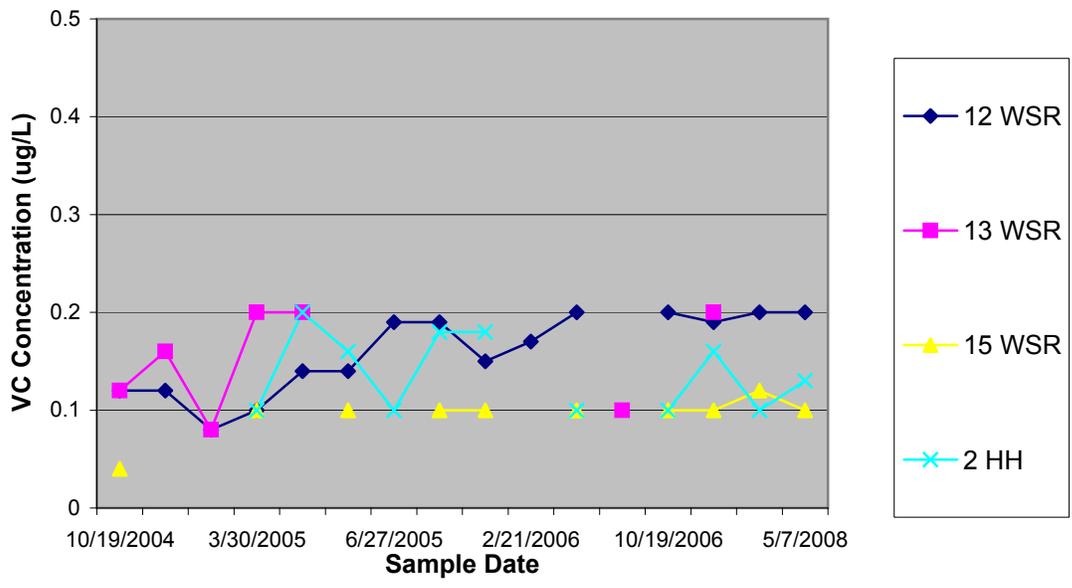


Chart 2 - Hwy 96 Dump Site, Residential Well Data (2004-2008), West Gilfillan Lake

