

Letter Health Consultation

RENVILLE COUNTY LANDFILL

OLIVIA, RENVILLE COUNTY, MINNESOTA

JANUARY 28, 2009

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

RENVILLE COUNTY LANDFILL

OLIVIA, RENVILLE COUNTY, MINNESOTA

Prepared By:

Minnesota Department of Health
Site Assessment and Consultation Unit
Environmental Health Division
Under a cooperative agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry



August 28, 2008

Mr. Mark Rys and Ms. Heidi Kroening
Minnesota Pollution Control Agency
520 Lafayette Rd.
St. Paul, Minnesota 55155-4194

Dear Mr. Rys and Ms. Kroening:

This letter is to document a recent Minnesota Department of Health (MDH) review of investigation activities at the Renville County Landfill and nearby detections of vinyl chloride in a residential well.

Background

In October 2003, vinyl chloride was detected in a private well near the city of Olivia, in Renville County, Minnesota. In June 2006, the Agency for Toxic Substances and Disease Registry (ATSDR) and the Minnesota Department of Health (MDH) issued a Health Consultation report that described the vinyl chloride exposures, evaluated the available data from field investigations, and concluded that the private well contamination had represented a past public health hazard, which had been addressed by the installation of a water treatment system, and the landfill represented an indeterminant public health hazard. The report also provided recommendations for additional actions that might better define the source and extent of the contamination and provide long-term protection for the affected resident. These additional actions were deemed necessary to help clarify whether the landfill posed a actual public health hazard.

Since the 2006 Health Consultation was issued, additional investigations and activities of the Minnesota Pollution Control Agency (MPCA) have addressed, directly or indirectly, most of the recommendations in the Health Consultation. In February 2008, MPCA and MDH staff met to discuss the work completed and (at that time) planned to occur this

year. Additional sampling at the Renville County Landfill occurred during the spring and summer of 2008, with the data being reported in August 2008.

Work Completed Since 2006

Work At The Affected Residence:

The MPCA installed four monitoring wells and a new drinking water well on the affected property. The monitoring wells were installed to determine if an up-gradient source of the vinyl chloride is or was present and to clarify the vertical distribution of the contamination. The only well that detected vinyl chloride was monitoring well MW-1, which was installed near the original drinking water well. MW-1 is screened at the 202 to 215 foot interval; comparable to the lower screened interval of the original drinking water well. Between September 2005 and October 2006, concentrations of vinyl chloride in MW-1 ranged from 0.8 to 1.5 micrograms per liter (ug/L). Since December 2006, trace levels of vinyl chloride (0.3 – 0.4 ug/L) have been detected in MW-1.

Vinyl chloride has not been detected in the new drinking water well that was installed near the original drinking water well, but screened at the 90 to 95 foot interval (comparable to the upper screened interval of the original drinking water well). No VOCs, including vinyl chloride, have been detected in the other three monitoring wells installed between the original affected residential well and the Renville County Landfill.

The original drinking water well was constructed before the Minnesota Well Code went into effect. It was constructed of polyvinyl chloride (PVC) casing, was not grouted, and had “screened” intervals across two separate aquifers; such a well would not be legal if constructed today. Because the construction provided a potential pathway for cross contamination between shallow and deeper groundwater, the MDH Well Management program urged the well owner to allow the MPCA to seal the well. On December 15, 2006, the well casing was drilled out and the hole sealed. Sealing of the well was documented with the MDH well management program (well sealing record #231580). Samples of the PVC casing were retained for testing to determine if the casing material could have been the source of the vinyl chloride in the water from the well. MDH and Minnesota Valley Testing Lab conducted a variety of independent tests on the well casing material. The results indicated that the PVC material used in the well casing was capable of leaching vinyl chloride at concentrations similar to, and higher than, those detected in the water from the affected residential well.

While the leaching tests do not prove that the well casing was the source of the vinyl chloride contamination, the sampling results from the monitoring wells installed at the affected residence suggests that this is the case. Monitoring wells MW-2 and MW-3, located near the north of the property - between the residence and the Renville County landfill, have never detected any VOCs. Monitoring well MW-4, located immediately

upgradient of the original drinking water well and screened in a sand lens at the same depth as the MW-1 and the lower screened interval of the water well, has never had a detection of VOCs. Only well MW-1, located adjacent to the original well, has had detections of one VOC, vinyl chloride, and only trace levels of vinyl chloride (0.3 – 0.4 ug/L) have been detected in that well since the original PVC-cased drinking water well was removed. These data suggest that the Renville County Landfill was not the source of vinyl chloride contamination in the area, but rather the vinyl chloride contamination was localized around the original drinking water well and has now been addressed.

Work At The Renville County Landfill:

Routine sampling of monitoring wells at the site has occurred since August 1994. This sampling provides information regarding water quality immediately downgradient of the disposal areas and also along the compliance boundary of the site. Sampling results indicate that shallow groundwater leaving the site is below the drinking water standards for all contaminants detected. Vinyl chloride has not been detected in any monitoring well at the site since October 2003.

In April 2008, an additional monitoring well, MW-34D, was constructed to provide information regarding hydrologic and water quality conditions at depth. The well was installed near well MW-34, south of the demolition landfill portion of the landfill property. This location was selected to provide a sampling location within the uppermost groundwater bearing unit confined beneath the valley train deposits associated with Beaver Creek. If landfill-related contaminants have migrated downward from the landfill and underlying outwash sands, it is expected that they would migrate into and this groundwater bearing unit as the initial receptor. However, MW-34D exhibits artesian conditions, indicating that groundwater in the lower sand unit is under confined conditions, as was also seen in the former well nest at 14-OWA and P-14A. This strong upward potential to groundwater flow would tend to prevent downward migration of contaminants.

Three rounds of sampling were conducted from MW-34D. Two of the rounds utilized vinyl chloride detection limits of 0.2 parts per billion in the samples collected. Neither vinyl chloride nor any other VOC was detected in any of the three sampling events.

Status of MDH Recommendations

Recommendation #1: *Deeper monitoring wells should be installed to the south and southwest of the closed, unlined portion of the landfill to determine if contaminants have migrated into the buried sand aquifers and may be acting as the source of the contamination in the groundwater at residential well R-1:* A deep monitoring well, MW-34D, was installed south of the demolition portion of the landfill to provide a

associated with Beaver Creek. Sampling of the well has not detected any VOCs. Furthermore, MW-34D exhibits artesian conditions, evidence of a strong upward potential to groundwater flow that would tend to prevent downward migration of contaminants. It is more likely that contaminants exiting the landfill would tend to migrate laterally through the outwash sands above the clay till and discharge to Beaver Creek, rather than downward through the clay into lower sand lenses. MDH considers these actions have met the intent of the recommendation.

Recommendation #2: *The West Fork of Beaver Creek should be sampled for VOCs, not just inorganic compounds, to determine if any landfill related contaminants are entering the stream. If possible, these samples should be collected beneath the ice in late winter and from the middle or lower portion of the water column, to obtain samples least affected by volatilization and photodegradation.:* Sampling of shallow monitoring wells (26-OWA, 29-OWA, 30-OWA, 31-OWA, and 32-OWA) that are located immediately downgradient of the closed, unlined portion of the landfill, within or downgradient of the manmade wetland, and upgradient of the creek has detected only five VOCs since June 2006. Those VOCs (benzene – max. of 3.8 ug/L, chlorobenzene – max. of 1.2 ug/L, chloroethane – max. of 1.3 ug/L, ethyl ether – max. of 35.7 ug/L, and tetrahydrofuran – max. of 10.5 ug/L) have not exceeded the compounds' respective Health Risk Limits. In 2007, only one VOC (ethyl ether – 35.7 ug/L) was detected in any of these wells. These results reflect the water quality of groundwater discharging to the creek. They also provide a “conservative” estimate of the creek water quality, as VOC concentrations in the wells would be higher than those detected in water in the creek, where the base flow of the stream would dilute the VOC concentrations. MDH considers these actions have met the intent of the recommendation.

Recommendation #3: *The new clean well at the affected residence should be connected to the home as the drinking water supply well. The old well, which is not constructed according to the Minnesota well code, should be properly sealed. Regular sampling of the drinking water at the residence should continue until additional investigation work indicates there is no potential for vinyl chloride or other contaminants to enter the well:* The new drinking water well was sampled monthly from September 27, 2005 to April 13, 2007; no VOCs were detected. The new well was connected to the affected residence in December 2006 and the original contaminated water supply well was sealed on December 15, 2006. Sampling of MW-1, the monitoring well installed nearest the original well, has shown decreased concentrations of vinyl chloride since the original well was removed. No VOCs have been detected in the other monitoring wells at the affected property. MDH considers this recommendation to have been met.

Recommendation #4: *All private wells located to the south and southwest of the landfill that have not yet been sampled should be sampled. Private wells previously sampled with a detection limit of 0.5 ug/L for vinyl chloride should be re-sampled and analyzed*

using a lower detection limit (no more than 0.25 ug/L): Monitoring at the Renville County Landfill indicates that VOCs are not migrating away from the site at levels that would affect nearby residential wells. However, MDH will continue to offer sampling of the residential wells located downgradient (south and southwest) of the landfill on a biennial basis for the next 10 years to provide a check that no VOCs are entering the wells. MDH considers that this sampling will fulfill this recommendation.

Recommendation #5: *The VOC analytical methods should achieve at least 0.25 ug/L method detection limit for vinyl chloride and report any peaks detected below the method detection limit:* In 2007, samples from the drinking water well and monitoring wells at the affected residence were analyzed using laboratory methods that achieve a method detection limit of 0.2 ug/L for vinyl chloride. Samples from the new deep well, MW-34D, have also been analyzed using the lower detection limit for vinyl chloride. While samples from other monitoring wells have not been analyzed using the lower detection limit, which can be exceptionally difficult to reach in samples containing multiple VOCs, in 2006 they achieved detection limits of 0.6 ug/L and no vinyl chloride was detected. In 2007, the detection limits for well samples at the landfill was again 1.0 ug/L. However, the laboratory reports provide indications if the compound are present at concentrations below the method detection limit. Taken together, this data indicates that vinyl chloride is not migrating from the site. MDH considers these actions have met the intent of the recommendation, but urges that lower detection limits (at least 0.5 ug/L) be achieved in future samples at the landfill. MDH further recommends that when contaminants are found to be present in samples at concentrations below the detection limits, this be reflected in the summary data tables of the monitoring reports.

Recommendation #6: *Well 25-OWA had high concentrations of VOCs that abruptly “disappeared” when the well apparently was replaced with 25-OWR. Well 25-OWR should be evaluated to determine if samples from it are truly representative of the water quality in that portion of the landfill:* Additional sampling of well 25-OWR and further evaluation of sampling data suggests that well 25-OWR is representative of the shallow groundwater in this area. No VOCs were detected in well 25-OWR in 2006 or 2007. Similarly, no VOCs were detected in well 26-OWA. Other wells (26-OWA, 27-OWA, 29-OWA and 30-OWA) located south and southwest of the closed, unlined portion of the landfill experienced substantial decreases in VOC concentrations at approximately the same time (mid- to late-1990s) as the replacement of 25-OWA by 25-OWR occurred (1999). This site-wide reduction in VOCs may be attributable to capping of the closed, unlined portion of the landfill. Between 1986 and 1994, the unlined portion of the landfill was closed and capped with up to two feet of compacted clay. Capping reduces infiltration through the waste, resulting in reduced migration of leachate and contaminants from the disposal area. Over time this would be reflected by decreasing VOC concentrations in the downgradient monitoring wells. MDH considers this recommendation to have been met.

Conclusions

Based on the available data, the Renville County Landfill does not represent a public health hazard. Continued groundwater monitoring at the landfill and the planned biennial sampling of residential wells in the area will be used to ensure the landfill is not acting as a source of contamination to drinking water in the area. In order for the residential well sampling to provide that assurance, MDH will use a method detection limit for vinyl chloride of no more than 0.25 ug/L for the residential samples. MDH strongly recommends that a similar detection limit, or at least no higher than 0.5 ug/L, be used for the downgradient monitoring wells at the landfill and that any detections of vinyl chloride below the detection limit be clearly indicated in data summary tables.

MDH appreciates the actions taken by MPCA and Renville County to address the concerns raised by the Health Consultation report. If you have any questions regarding this letter, please contact me at 651-201-4930 or virginia.yingling@state.mn.us.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ginny Yingling". The signature is written in black ink on a white background.

Ginny Yingling
Site Assessment and Consultation Unit
Environmental Health Division

Certification

The Minnesota Department of Health prepared this Letter Health Consultation, Renville County Landfill – Vinyl Chloride, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). At the time this Health Consultation was written, it was in accordance with the approved methodologies and procedures. Editorial review was completed by the Cooperative Agreement partner.



Technical Project Officer, Cooperative Agreement Team, CAPEB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.



Team Leader, Cooperative Agreement Team, CAPEB, DHAC, ATSDR