

General Questions

Q: How do I obtain more information about the landfill monitoring results and cleanup of the Site?

This work is being done in cooperation with Wisconsin Department of Natural Resources (WDNR), and Wisconsin Department of Health Services (WDHS). You can contact the project managers (PM) for more information. A handout is provided with the contact information.

The WDNR is providing information on their Bureau for Remediation and Redevelopment Tracking System (BRRTS) on the Web. The site is identified as follows:

Schuster Drive Landfill
BRRTS#: 0267584461
DNR Facility ID#: 267059320

For general information, the different agencies have different specialties. For example, if you're looking for information on groundwater monitoring results or the vapor intrusion investigation, the WDNR PM would be the best person to contact. If you're looking for general information on VI or health risks associated with the specific compounds found in groundwater, WDHS would be the best sources.

Q: Who is responsible for the contamination?

The City of West Bend owns the landfill and is responsible for the associated monitoring and investigation work.

Q: What chemicals are being tested for?

The primary "chemical of concern" is trichloroethene, also known as TCE. TCE is the chemical that you'll hear most frequently discussed; however, other chemicals that TCE can degrade to (for example, 1,1-dichloroethene and vinyl chloride) will also be tested.

Q: What is the timeframe for testing?

The investigation has started in the areas where known TCE contamination exists above 5 µg/L (the Wisconsin Enforcement Standard) and groundwater is shallow, less than 10 feet below the ground surface. Further data will be developed to better understand the vapor intrusion risk and where the investigation will progress to next. Because we also must coordinate in-home access with individual property owners and allow for receipt of laboratory analyses, we expect that the investigation will be conducted over the next few months. However, the City plans to provide regular updates on the progress of the investigation, so that residents remain informed.

VI-Specific Questions

Q: What is vapor intrusion?

Vapor intrusion is a newer concept and evolving science that is being evaluated more closely by regulatory agencies.

Vapor intrusion can occur when vapor-forming chemicals (chemicals that evaporate when exposed to air, e.g., VOCs) migrate as a gas from the soil or groundwater. If VOC vapors are near a building foundation, they can accumulate beneath a building, and sometimes enter a building through cracks or openings in the foundation.

Q: What is the cause for the vapor intrusion?

Vapor intrusion in the Villa Park Neighborhood is caused by groundwater contaminants, like TCE, that are migrating away from the landfill. Therefore, the first step to understand the potential vapor intrusion risk to buildings is to investigate where groundwater contamination is located and how deep beneath the building foundations.

Q: Is surface water a potential concern?

Surface water from storm water runoff is not a concern for vapor intrusion. Storm water is from precipitation events, like rain or snow melt, that accumulate and then flow over ground into swales and eventually to wetlands or surface water at lower elevations. Because the stormwater does not contact the landfill contaminants, it will not carry contamination from the landfill.

Q: Has vapor intrusion been evaluated previous to this testing?

Vapor testing inside homes has not been conducted before July 2019. The supplemental groundwater investigation conducted early in 2019 was designed to evaluate the conditions that could result in vapor intrusion. Those results prompted the subslab and indoor air sampling beginning in eight residences in the Villa Park Subdivision in July 2019.

Q: Why is vapor intrusion testing being performed now?

The vapor intrusion investigation is the next step in the on-going monitoring and evaluation work being conducted by the City of West Bend.

Q: Why was this house chosen for vapor intrusion testing? Are you testing other houses in this area?

The houses tested in July were selected based on several factors, but mostly because they are closest to groundwater with TCE concentrations above 5 µg/L. There are other houses over groundwater with similar concentrations of TCE; however, groundwater is shallow, less than 10 feet below the ground surface in the area of the tested houses, so they were tested first.

Q: How do you test for vapor intrusion?

This sampling is specifically to evaluate if vapors from groundwater are entering the house. Samples are collected from below the building slab or below the basement floor and from inside the house. Those results will be compared as “line of evidence” in assessing the source.

Samples from inside the house are the “indoor air samples” and will be collected in a steel container with an intake regulator over a 24-hour period. The lowest accessible floor space in the building (for example, the basement or crawl space) will be checked for potential vapor pathways, such as cracks, utility conduits, or sumps.

Also, because indoor air often contains chemicals from consumer products, building materials, and outdoor (ambient) air, we will need to interview the owner/occupant about the types of products used and activities conducted in the house and will conduct an inventory of products/materials in the house that may interfere with the air sample results. If any products are found that may affect the sample results, they will be removed from the building at least 48 hours before air samples are collected.

Samples will then be collected from below the building slab or basement floor. The sample will be collected through a small sample port installed through the floor. More information about the sampling procedure is provided in this hand-out.

Q: Why is “sub-slab” sampling necessary?

Sub-slab sampling is needed to evaluate whether vapors detected in indoor-air samples are entering the house from the subsurface (below the building) or are originating from an indoor source.

Q: What are some typical sources of VOCs in indoor air other than vapor intrusion?

VOCs can be present in indoor air in houses as a result of using various consumer products, from combustion processes, from occupant activities, or releases from building materials. Some examples include:

Consumer products: packaging, cleaners, air fresheners, aerosols, mothballs, scented candles, insect repellants

Combustion processes: smoking, cooking, home heating

Occupant activities: craft hobbies, home improvements, automotive repairs

Releases from building materials: carpets, adhesives, insulation, paint, wood-finishing products, some foam mattresses

Outdoor sources of VOCs may also be a factor in indoor air quality. Airborne chemicals can be drawn into your house via open windows or the HVAC system from sources like nearby (or even regional) industrial facilities, paint or pesticide applications, vehicle emissions.

Specific VOCs, like TCE, can also be found in several household products. If TCE is used where you work, it can get into your house by attaching to your clothing.

Q: When do you expect to get results on the vapor intrusion testing?

For Owner-occupied Properties: Once we receive the signed access agreement, we will coordinate with you to conduct the sampling at a mutually-convenient time. Once the samples are collected, results are usually available within about 4 weeks.

For Tenant-Occupied Properties: Once we receive the access agreements, and you coordinate access for us with your tenants, we will coordinate with you to conduct the sampling at a mutually-convenient time. Once the samples are collected, results are usually available within about 4 weeks.

Q: Who gets the results?

The results will be provided to the property owner/occupant and to the project managers from Wisconsin DNR and the Wisconsin DHS.

Q: What is cost for the vapor intrusion testing and mitigation?

Because the City owns the landfill, the City is paying for the costs to conduct the necessary investigations and mitigation to address the identified vapor intrusion risks. The cost for the vapor intrusion tests has several variables including coordination with property owners, the number of visits needed, and the results of each test.

Similarly, the costs for vapor intrusion mitigation such as installing a sub-slab depressurization system also cover a range that is dependent on the size of the needed system, addressing pathways such as cracks and openings, and time needed to optimize the system.

Q: My understanding is that there was hydraulic studies done decades ago when the landfill was first capped. 3/20/20

Concerns regarding groundwater contamination associated with the site developed in the mid-1980s and resulted in a series of environmental investigations. Based on September 1985 volatile organic compound (VOC) data from site monitoring wells and private wells in the site vicinity, a contaminant plume was identified that extended east of the landfill boundaries to the Jansen subdivision which, at the time, relied on private wells for individual household use. The City subsequently extended the municipal water supply system to the area of the affected private wells by 1987. The private wells were then taken out of service and abandoned, with the exception of some private wells used for groundwater monitoring.

Subsequently, the WDNR outlined for the City the activities necessary to achieve compliance with groundwater standards and to protect public health, safety, and welfare. The City completed the preparation of a focused alternatives analysis and source control remedial action selection report to recommend a system for control of source area contaminant migration into local groundwater. Based on the evaluation of

alternatives and preliminary remedy selection, the City undertook a field program of well installation, monitoring, and testing to evaluate design parameters for the selected groundwater extraction system.

Geologic and hydrogeological data collected under these activities allowed for a more complete interpretation of site conditions, with respect to both the design of the groundwater extraction system, as well as regarding overall groundwater flow directions. The interpretation of hydrogeologic conditions indicated a pronounced clay till high at the southeast margin of the site. Groundwater flow in the shallow sand and gravel aquifer apparently divides around the clay till high, resulting in a northeast and southern direction of flow away from the site. Further investigation work performed supported this conclusion.

Based on these studies and discussions with the WDNR, it was agreed that no additional investigation would be necessary at that time and that groundwater extraction from the sand and gravel aquifer would provide contaminant migration control. The City installed a compacted clay cap over the landfill and has operated the perimeter groundwater extraction system for more than 20 years. During that time, the City has also continued to conduct groundwater sampling of monitoring wells and private wells. Over the years, the groundwater data indicates that the VOC concentrations have decreased substantially since the groundwater extraction system began operation. However, the groundwater plume still is present beyond the landfill boundaries and still exceeds the NR140 groundwater standards.

Has the model successfully predicted where we are seeing the presents of vapor intrusion? 3/20/20

The conceptual site model developed during the previous hydrogeologic studies is consistent with our current understanding of the groundwater plume. The recent groundwater investigations are providing more information in specific locations where there previously was not data.

Q: The landfill was capped years ago and monitoring tests were conducted at that time. Do we know what caused the change? 3/20/20

The landfill was closed in 1984 under approval from the WDNR. Concerns regarding groundwater contamination associated with the closed landfill developed in the mid-1980s and resulted in a series of environmental investigations that identified the presence of a large VOC plume emanating from the landfill extending almost 1 mile downgradient to the south and east. Because impacts to private wells, the City extended the municipal water supply to the affected areas. Based on the investigation results and discussions with the WDNR, a remedial action was implemented in the 1990s, including the installation of a compacted clay cap and a perimeter groundwater extraction system. The selected remedies were to prevent direct contact with the landfill waste and control further migration of the groundwater VOC plume. At the same time, the landfill was also assessed for landfill gas production and potential

migration. Decaying wastes that are present in the landfill are known to generate gases that can accumulate under the compacted clay cap and may migrate away from the landfill in the ground above the water table. Therefore, based on the landfill gas assessments and WDNR requirements, a landfill gas extraction system was also installed along with a perimeter gas probe monitoring array.

The City has operated both the landfill gas and groundwater extraction systems as well as performed landfill gas and groundwater monitoring for more than 20 years. During that time, the groundwater data indicates that the VOC concentrations have decreased; however, the groundwater plume still is present beyond the landfill boundaries and still exceeds the NR140 groundwater standards. In addition, landfill gas monitoring data shows that the extraction system has successfully controlled landfill gas beneath the landfill cap and has prevented migration beyond the landfill boundaries. These systems addressed the impacts and risks identified at the time, and they have continued to do so.

What changed in recent times was the recognition of the risks presented by the vapor intrusion pathway potentially emanating from a groundwater plume. Based on that recognition, the WDNR has developed new requirements and guidance, and the City has now undertaken groundwater and vapor intrusion investigations to address these risks.

Can it be reversed? 3/20/20

The conditions at the landfill or of the groundwater plume have not changed, and they cannot practically be reversed. However, the City, with the help of the WDNR and the WDHS, are implementing mitigation systems to address the vapor intrusion risks that have now been identified.

Q: Is there any indication vapors are traveling into homes from sources other than groundwater? 3/20/20

No, the investigations presently underway have not indicated that VOC vapors are migrating along the backfill of buried utility trenches. In a few instances, VOC vapors detected in homes were determined to be originating from household products or materials and not from the groundwater plume.

Q: Based on the testing that has been conducted thus far, what trends are we seeing? 3/20/20

The City has conducted initial vapor intrusion testing at almost half of the properties in the Villa Park Neighborhood and close to three-quarters of those that were identified as sensitive receptors. These results indicate that close to three-quarters of the subdivision appears to be at low risk for vapor intrusion, which has allowed the City to focus on the area where vapor intrusion has been identified. In the area where vapor intrusion is occurring, the City has quickly installed mitigation measures including the temporary installation of portable air purification units and the permanent installation

of sub-slab depressurization (similar to radon) systems. The City is continuing to work with the WDNR and WDHS to address the focus area and to mitigate any concerns as quickly as possible.

Q: Is the testing still going on? 3/20/20

The vapor intrusion and ground water investigation continues to be an active investigation. The City will be conducting additional testing based on data already obtained, along with follow-up testing to those that have already been tested in an effort to confirm previous data.

Q: Is my home going to be tested? 3/20/20

Data collected from testing that was conducted in 2019 and early 2020 has clearly determined where vapor intrusion may potentially be occurring and have also indicated that the majority of homes in the Villa Park neighborhood are not at risk for vapor intrusion. Property owners in close proximity to this area have been contacted for testing. Only homes within our current site focus will be contacted for additional testing.

Health/Safety-Specific Questions

Q: How could I come in contact with the contaminated groundwater?

It's not likely that you would come in contact with contaminated groundwater.

The affected groundwater is at least 5 feet below ground – more than 50 feet below the ground in some areas.

Drinking water is provided to the Villa Park Neighborhood through municipal water supply, which is obtained from locations well away from the impacted groundwater in the area and is regularly tested.

Q: What are some health effects from the VOCs being evaluated here?

As with almost any chemical, direct exposure to VOC vapors has the potential to make people ill.

The VOCs being tested for can cause cancer or other health effects under certain circumstances, usually only if they are exposed to high concentrations over decades.

The degree of risk depends on the specific VOC, the concentrations, the amount of time, and many other individual/personal factors, such as a person's overall health, whether they smoke or live with a smoker, and even genetics. So, an individual may be more or less sensitive than the "average" person to any chemical exposure.

Regulatory screening levels have been developed based on the toxicity, or health effects, of individual VOCs. These screening levels are generally conservative – that is, they are developed in consideration of people who are "more sensitive" to chemical exposures.

Q: Are there any VOC vapor levels above regulatory screening levels in this area?

Of the eight indoor air samples that were collected in July 2019, only three had levels of TCE above the Wisconsin Vapor Action Level (VAL).

Other chemicals were found at concentrations above the VALs in some samples, but those chemicals were not found in the sub-slab samples or are not in the groundwater, so those are not believed to be from the landfill.

Q: How high do the levels have to be to cause the area to be unsafe to work or live in?

VALs have been developed based on the toxicity, or health effects, of individual VOCs.

If VOC vapors are found at concentrations above these screening levels, it does not necessarily mean that individuals are at risk of becoming ill, because individual/personal factors, such as a person's overall health, whether they smoke or live with a smoker, and even genetics, can affect how a person will respond to exposure to a specific chemical.

However, if VOC vapors are above screening levels due to vapor intrusion, additional evaluation or corrective action may be necessary to reduce the possibility that human health might be affected.

Q: If vapor intrusion is found, what are the next steps?

It depends on what levels are found and where they are found.

If VOCs from vapor intrusion are above the VALs are found inside houses, corrective actions will be taken to reduce the levels. Depending on the house, this might include sealing floor cracks and sumps and installing an air purifier as a temporary measure before installing a sub-slab depressurization system.

If a corrective action is implemented, confirmation sampling would be performed to verify that the system is effective.

Q: Is it safe to grow and consume vegetable in my garden? 3/20/20

Response from Department of Health (DHS)

Produce grown in gardens throughout the Villa Park Neighborhood are expected to be safe to eat. The TCE is moving through groundwater, which is at a level 5 to 50 feet below the ground surface depending upon where you are at in the neighborhood. In addition, TCE is very volatile which means it has a high tendency for movement from water into the air. As a result, any TCE that might be taken up into a plant will quickly pass through the plant and release through the leaves into the air. Several scientific studies have been published that confirm this observation. Further comments or questions on this topic can be directed to Dr. Curtis Hedman at the Wisconsin Department of Health Services (Office Phone = 608-266-6677).