

# Why You Should Care about the Groundwater at Your Landfill

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When managing landfills, people often treat groundwater monitoring as a compliance requirement, a box to check and file. If that is all you are doing, you are missing a major opportunity to gain insight into your landfill. Groundwater is more than a regulatory requirement; it is one of the most powerful tools for understanding your landfill's performance and



*Access to reliable monitoring infrastructure enables consistent data collection, allowing for the interpretation of long-term trends and the uncovering of patterns tied to operational infrastructure changes.*

health. If you are not using your groundwater data to learn about your facility's health and behavior, you are not getting the full value of your monitoring program.

## Your Landfill's Feedback System

Groundwater monitoring is more than just sampling and reporting. It is your landfill communicating what is happening beneath the surface, below the waste mass, around containment systems, and through the natural geology of the region. Those communications, often in laboratory data, flow patterns, or elevation changes, build a narrative about site conditions.

Groundwater monitoring acts as your landfill's feedback system, telling you whether the system is doing its job, highlighting subtle shifts before they become serious issues, and providing quantifiable evidence about the effectiveness of recent operational or engineering changes.

## Diagnosing Your Site's Health

You already have a mental checklist for assessing your landfill's performance. Are leachate volumes within expected ranges? Are downchutes undermined? Is the gas collection doing its job?

While these are important questions, they are mostly surface-level indicators of a landfill's performance and health. Groundwater data gives you the sub-surface analysis you cannot see with a site walk. Groundwater monitoring can help answer questions like:

- Is the liner system functioning properly?
- Has the recent increase in rainfall influenced groundwater trends?
- Are there seasonal patterns that correlate with site activity?

## Early Warnings Mean Fewer Emergencies

The most expensive problems at a landfill are the ones you do not see coming. An early warning is such a valuable concept in solid waste management. Minor changes in indicator parameters like chloride, specific conductance, or a volatile organic compound can be the first sign the landfill system is under stress. These signals often appear months

before serious issues manifest. If you are watching the trends, not just exceedances, you can spot potential problems before they grow.

Early detection opens the door to targeted actions—regrading slopes, adjusting leachate pump activation levels, refining filling practices. These small adjustments are less costly than site-wide corrective actions or long-term remediation.

## Making The Data Useful and Not Just a Report

To get more out of your groundwater monitoring program, try to incorporate the following into day-to-day operations at the landfill:

- *Establish consistent data review practices:* Set time aside to analyze the data.
- *Visualize trends:* Use charts, contour maps, or GIS tools to detect patterns over time.

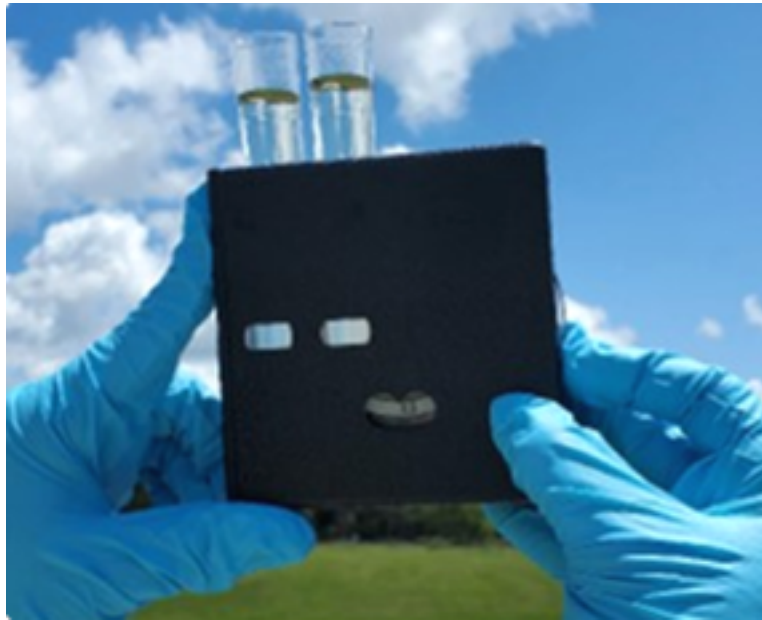


*A well-designed monitoring network supports spatial and vertical data review, helping translate data into meaningful site narratives that reveal potential impacts, system inefficiencies, or maintenance needs.*

- *Look beyond parameters:* Consider the laboratory data alongside groundwater elevations, flow directions, and seasonal shifts.

- *Loop in operations:* Connect what you see in the data with what is happening on the ground: recent construction, rainfall, or operational changes.

Incorporating these steps does not mean you have to become a groundwater expert overnight. Landfill technology tools like eTools and RMC help you collect, monitor, view, and manage data to help facilities operate more efficiently. These tools make it easy to spot trends or conditions that help continually gauge operational health and spot exactly where and when you need technicians to investigate. It is about asking questions, using available technology, and encouraging collaboration to understand the landfill's overall health.



*Field measurements offer real-time insight into subsurface trends and provide early warning signs that can guide deeper data review and site diagnostics.*

### **Turning Monitoring into Management**

The most successful landfill managers consider groundwater data to be part of their landfill performance toolbox. Like compaction records, tonnage receipts, or gas system metrics, groundwater monitoring shows how well your systems are functioning.

Groundwater monitoring does not take center stage. It is steady, methodical, and easy to overlook amid the more visible parts of landfill operations. That quiet consistency is exactly what makes it valuable. With every sampling event, you add to a long-term record that reveals what is working, what is changing, and where your attention needs to be.

Rather than treating your groundwater system as background noise, bring it into focus. Use it as a tool for operational insight, planning, and performance evaluation. So, the next time you get your groundwater

sampling results, do not just file them away. Read between the lines. Your groundwater is trying to tell you something. Are you listening?

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