# A REMOTE APPROACH

Remote monitoring systems gather landfill gas collection data and offer a quick solution for companies.

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**ONE TAKEAWAY LONG BEACH,** California-based SCS Engineers has gathered after years of collecting data through leachate management and landfill gas (LFG) collection and control systems is that many companies don't have the time or resources to adequately analyze, and act upon, the enormous amount of available data they're collecting. In other cases, SCS finds that this data is simply not being collected at all.

These problems can be laid to rest by using remote monitoring and control (RMC) systems. RMC systems use the latest technology to capture data and perform routine analysis before sending organized reports to operators, engineers and project managers. These integrated systems are designed to allow people to focus on making sound decisions without having to decipher large reams of data.

RMC systems have the same purpose as their stand-alone brethren. Beyond that, they couldn't be more different. Think of a smartphone versus a rotary phone. Both make phone calls, but the smartphone is mobile, adaptable and offers tons of additional features like apps, a camera and more.

RMC systems also help users better understand, operate, troubleshoot and fix their systems efficiently by providing:

- remote monitoring;
- remote control of operations;
- data recording at set intervals;
- intelligent alarms sent to users;
- processing, analyzing and reporting of data in real time; and
- remote troubleshooting and programming.

### THE COMPONENTS

The following is a breakdown of the system features that will help you better understand what makes an RMC system different:

- **Programmable logic controller (PLC):** This is the brains of the system. It runs the show based on a preprogrammed sequence of operations.
- **Touch screen:** Lets users operate the system and is often used to send alarms.
- **Data recorder:** Captures and records operational data at set intervals, sends data to remote locations and sends alarms. The recorder can be accessed remotely.
- **Connectivity:** System components can commu-



RMC systems allow users to better monitor and control their sites through more interactive features.

nicate with each other via hard wire or radio frequency. The system communicates with remote users over cellular or wired internet connection.

- **Network security:** Hardware and software that prevents unauthorized users from accessing the RMC system.
- **Local/remote alarms:** Alarms sent to users.

The following case studies present RMC systems that SCS Engineers has developed and implemented at sites across the U.S:

### CASE STUDY 1:

California-based Integrated Waste is a division of the Sonoma County Department of Transportation and Public Works (TPW) that operates five closed landfills. Its cloud-based RMC system monitors liquid levels in real time across the sites and notifies operators when setpoints have been exceeded.

Users can look at all five sites to manage and coordinate hauling of liquid and make other decisions, while rainfall reports are automated to save time typically spent manually collecting the data for reports. Operators and liquid disposal vendors are also instantly notified by the system when trigger levels have been met, which allows streamlined communication and quick response.

The system also monitors grid power, backup generators and solar power systems made to minimize downtime. The data is captured and streamed to the cloud.

The system then allows operators to view data from individual sites and all at once.

When a setpoint has been exceeded, an alarm is sent to operators and liquid haulers via a combination of email, voice and text alerts. Alarms are sent through a central gateway that supports all five sites, which is designed to make alarms easily adjustable remotely. Each of the five sites has data collection points that are connected via a wireless local area network using radios. The RMC system also uses a cellular modem to securely send data to the database.

With the RMC in place, the client has eliminated manual inspections of the site, which has resulted in cost savings and better time management.

### CASE STUDY 2:
One Georgia landfill using this technology has a system that connects several evaporators into a single interface, allowing operators to quickly monitor and control each one. Each evaporator includes a complex control process with hundreds of sensors. The ability to trend and analyze sets of data through one interface helps operators troubleshoot and refine the system. Automated reports help upper management analyze and review large quantities of data in a clean and easy-to-read format.

The RMC system provides the tools for operators to quickly view, analyze and react to the data being captured. The system presents the data in both graphical and numeric format and allows operators to query the data and export information to Excel, PDF or CSV formats. Data is presented through a web-based interface so it can be viewed from a variety of operating systems and devices. Current security protocols are used to protect the data as well as provide access to the data.

Well-prepared, accurate and timely reports add a lot of value to projects. The automated reporting built into this system generates and emails reports to users on a daily, weekly, monthly and annual basis. The reports are customizable and provide the total amount of leachate pro-


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cessed, runtime hours, liquid levels, LFG quality and LFG flow.

The RMC system eliminated manual inspections for the site.

### CASE STUDY 3:
At one landfill in the Mid-Atlantic region, LFG is pulled from the well field through the primary blower and pushed to the primary flare and the LFG compression system. There is an underground liquid handling tank nearby that receives and pumps condensate and leachate. Other system components include a backup blower and a backup flare.

Prior to the RMC system integration, the controls for the blower/flare system and the liquid handling tank were separate. These components were integrated into a combined RMC system.

The new RMC system records data to help diagnose and repair mechanical and electrical problems with the system, such as negative blower discharge pressure and air compressor issues.

The new system also includes alarms for high and low vacuum. Again, radios were used to power communication between the blower/flare control system and the liquid handling tank. The wireless local area network created using the radios allows the two systems to communicate data, including compressed air pressure, total liquid flow, power status and pump station high-level alarm.

Alerts and alarms were very limited

with the old system. The RMC system added detailed email and text alerts. The new system also provides remote troubleshooting and programming, which saves travel costs and downtime. Through the RMC system integration, operators can balance the LFG engines and flares, thus allowing informed decisions to be made based on current field conditions.

### REMOTE BENEFITS
In an increasingly complex regulatory world, RMC systems provide the tools necessary to improve safety, increase efficiency and make the right decisions quickly. Beyond capturing and storing data, these systems can sort through mountains of data, identify what's important and deliver meaningful information to operators in real time or as needed.

Some of the added benefits of using the RMC systems include:
- early problem detection;
- minimal downtime;
- efficient and predictive scheduling of technicians;
- real-time analysis of data;
- automated reporting; and
- secure data storage. **wt**

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