

Project dossier



PROJECT DOSSIER

Highland Park Reservoir, USA

PROJECT OVERVIEW

Throughout 2022, PWSA invested \$24 million to replace the liner, cover, and other components of the 125-million gallon drinking water reservoir. The Highland Park Reservoir Project is located in the Highland Park neighborhood of the City of Pittsburgh, Allegheny County, Pennsylvania and this reservoir is one of major drinking water storage facilities in the city.

WHY MONITORING?

As a part of PWSA's revitalization efforts of more than 120 years old drinking water reservoirs in the City of Pittsburgh, Highland Park Reservoir No. 2 and Pump Stations has gone through significant repairs and updates. During construction phases, especially during refilling of the reservoirs, a long term monitoring program has been implemented that will continue for two years.

MONITORING SOLUTION

Rite Geosystems Inc., USA was entrusted to provide the instrumentation along with real time monitoring results for the project. Instrumentation basically included piezometers and inclinometers with automatic data collection and web based online data presentation.

Project	Highland Park Reservoir No. 2 Dam Safety Improvement Project
Location	Pittsburgh, PA, USA
Owner	Pittsburgh Water and Sewer Authority (PWSA)
Client	AWK Engineers
Consultant	Arcadis
Duration	2022-2024





SCOPE OF WORKS

Rite-Geosystems scope of works included:

- Supply of automated piezometer and in-place inclinometer system
- Supervising the first two piezometers and first two in-place inclinometers installation
- Training client crew on how to set up the datalogger, manual data retrieval, and troubleshooting
- Upkeep validity of instrumentation during installation
- Automatic monitoring at desired frequency
- Setting up an online web-based data management system (WDMS) and maintenance during the contract period; with instant alerts via SMS/emails
- Equip cloud based data management system with Google map and graphical navigation for quick view of all monitored data



Piezometer installed with datalogger

INSTRUMENTS USED

Instrumentation installed at this site included:

- Automated piezometers (10 sets)

Model EPP-40V vibrating wire piezometers were selected for monitoring water levels around the dam. These were installed on the crest of the dam and on the downstream side of reservoir. Model EPP-40V piezometer was selected because of its durability that made it best suitable for long-term monitoring required for this application. The data from piezometers is collected with our model ESDL-30 dataloggers with plug-and-play feature. Each piezometer was connected to an individual datalogger, installed at the top of borehole.

- Automated vertical in-place inclinometers (6 sets)

Model EAN-52M in-place inclinometers (IPI) are used to monitor stability of the embankment and slope around the reservoir. At six IPI locations, close to 90 numbers of digital IPI sensors were placed with 5 ft vertical spacing (gage length). Data from each IPI chain is collected with our model ESDL-30 dataloggers installed at each IPI locations.

The ESDL-30 dataloggers transmitted the data wirelessly, over cellular network, to central server. The data was available in near real time over our web based data management software, with instant alerts via SMS and emails.

RESULTS

With close to 100 sensor point monitoring, near real time monitoring provided critical information during reservoir repair refilling operations. The reservoir was refilled safely.



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