ACKCIO

Remote Monitoring Solutions for Tailings Dams

Tailings dams are used to store water and waste that come as byproducts from the mining process. These structures are designed for permanent containment of the tailings, which are often toxic. The need for regular maintenance and monitoring is paramount to ensure the ongoing structural safety of the tailings dam to contain the mining waste.

*This diagram is not drawn to scale. For illustration purpose only.

01 INTEGRITY OF SURROUNDING BUILDINGS

On nearby buildings, Ackcio **BEAM-AN-S1** (1 channel) and **BEAM-AN-S4** (4 channels) Nodes ensure real-time monitoring of crack meters and displacement sensors to ensure the safety of the surrounding infrastructure.
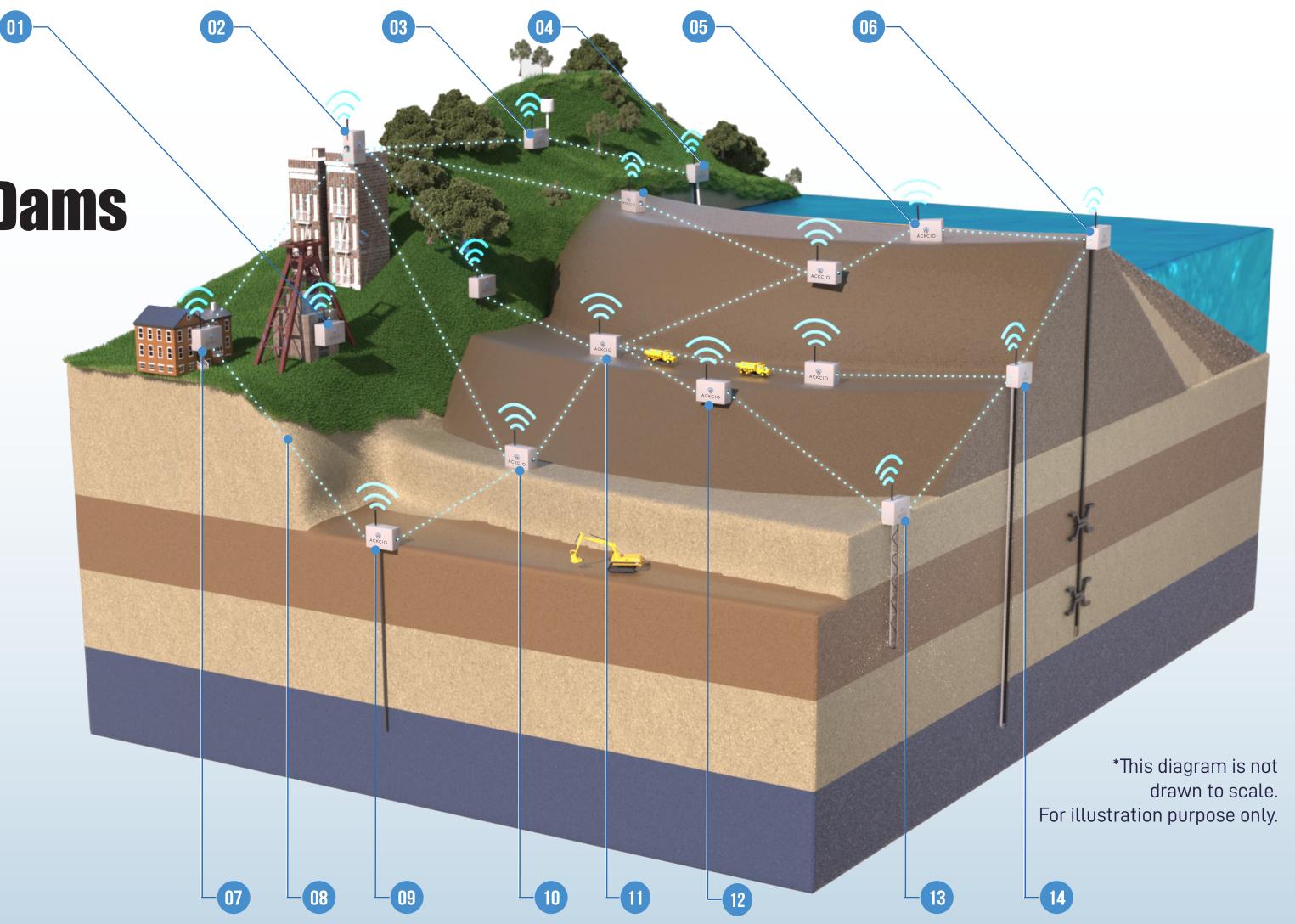
02 ACKCIO GATEWAY

The Ackcio **BEAM-GW** receives sensor data from the Nodes within the network. Ackcio's Snape software that runs on the Ackcio Gateway is used to configure and manage the project. It also provides the option to push the data via FTP and/or API server hosting a software (selected) of client's choice.

03 WEATHER STATION MONITORING

Ackcio **BEAM-DG** nodes monitor weather stations, providing a complete monitoring solution to the tailings dam.

04 WATER QUALITY MONITORING

Ackcio **BEAM-DG** Nodes bundle Ackcio's long-range wireless mesh technology with leading brands of environmental sensors, monitoring water quality of the dam water.

05 MONITORING WATER LEVEL

Ackcio **BEAM-DG** Nodes bundle Ackcio's long-range wireless mesh technology with leading brands of water level meters, monitoring the water level in the dam.

06 GROUND SETTLEMENT MONITORING

Ackcio **BEAM-AN-S4** (4 channels) Nodes automate the monitoring of a multi-point borehole extensometer (MPBX) that measures vertical deformation at various depths.

07 STRUCTURAL HEALTH MONITORING

Ackcio **BEAM-TM** Nodes bundle Ackcio's long-range wireless mesh technology with Sisgeo's trusted bi-axial self-compensated MEMS inclinometer, measuring the horizontal and vertical movement of the surrounding buildings.

08 ACKCIO MESH

Ackcio's patented long-range wireless **MESH** network connects the Ackcio Nodes to the Ackcio Gateway. The mesh network is self-healing, enhancing the transmission reliability. The ability to 'hop' up to 12 times significantly increases the reliability in complex environments and offers the ability to increase aggregate range if required. The system is highly flexible and scaleable.

09 IN-DEPTH GROUND DISPLACEMENT

Settlement/lateral displacement is monitored by leading brands of digital in-place-in-clinometers (IPI's)/MPBX/SAAs /extensometers in real-time using Ackcio **BEAM-DG** Nodes.

10 ACKCIO NODES

Each battery-operated Node acquires data from various sensors and transmits the sensor data wirelessly through the Ackcio Mesh network to the Ackcio Gateway.

11 REPEATER NODES

If deployment challenges reduce the range of Ackcio Nodes, Ackcio **BEAM-RN** Nodes assist in extending the wireless range of other Ackcio Nodes within the network.

12 SLOPE STABILITY MONITORING

Ackcio **BEAM-TM** Nodes can be used to monitor the slope stability on and around the tailings dam.

13 MONITORING PORE WATER PRESSURE

Piezometers measuring the pore water pressure are monitored in real-time using Ackcio **BEAM-VW-S1** (1 channel) and **BEAM-VW-S8** (8 channels) Nodes.

14 MONITORING UNDERGROUND WATER QUALITY

Ackcio **BEAM-DG** Nodes bundle Ackcio's long-range wireless mesh technology with leading brands of environmental sensors, monitoring water quality of the underground water.