Case Study

HMA GEOTECHNICAL

SAVAGE RIVER MINE –DEEP HOLE PIEZOMETER INSTALLATION OCT 2018 & MARCH 2020

BACKGROUND

Grange Resources operates Savage River Mine which lies 100km Southwest of Burnie in Tasmania.

The magnetite ore body stretches 25km south of the Savage River township ranging in thickness from 40m to 150m. Current production is two million tonnes of premium iron ore pellets; this is expected to rise to nearly three million tonnes as the open cut mine extends underground.

HMA Geotechnical was contracted to install vibrating wire piezometers both in the open cut pit and the newly opened underground drive.

Figure 1 – Savage River. Previously mined South Pit

OBJECTIVE

- Install piezometer strings in inclined boreholes up to 426m deep
- Fully grout boreholes
- Connect instruments to vibrating wire data loggers.

CHALLENGES

- Inclined boreholes 30o off horizontal.
- High rainfall.
- Remote location.
- Working underground in confined areas

Figure 2 – HMA technician Installing 400m string of vibrating wire Piezometers underground.

SOLUTION AND OUTCOME

All above ground instrumentation was successfully installed using HMA Geotechnical's custom designed vibrating wire piezometer installation winch truck. Eight boreholes in total were instrumented

The underground installations were carried out manually using PVC conduit to install the vibrating wire piezometers to the correct depth. Four boreholes in total were instrumented.

Figure 3 - HMA Geotechnical's winch truck installing VW Piezometer string through drill rods. Drill rig in-place.

INSTALLATION

Some boreholes were not able to stay open due to unstable fill material and fractured rock. The solution was to install the vibrating wire piezometer string through the drill rods, then, once the rods were removed, grout the borehole.

A wire loop was created at the top of the support wire, supporting the instrument string should the instruments slip down the borehole during drill rod extraction, thereby making retrieval possible.

The alignment of several of the angled boreholes were found to have deviated in so much as being nearly horizontal at the toe. To overcome the borehole misalignment and get the vibrating wire piezometers to the target depths, the semi-rigid instrument string needed to be pushed to the correct position as it was unable to be lowered into position via gravity under its own weight

Figure 4- Inclined borehole

Figure 5 - VW Data Logger

HMA Geotechnical successfully used their in-house designed articulated sinker weights for all the installations.

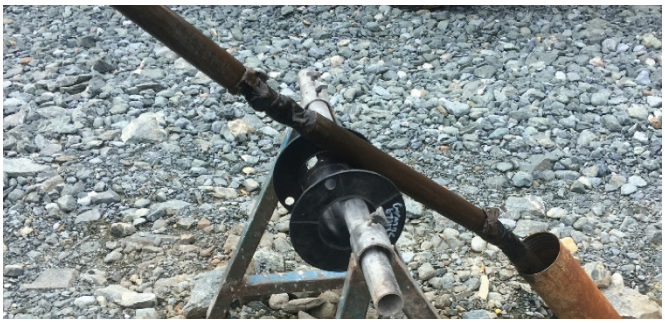

Figure 6 - Articulated sinker weight

All instruments were installed at the correct target depths with data loggers installed. Boreholes were fully grouted.

HMA GEOTECHNICAL STATEMENT

HMA Geotechnical have supplied bespoke monitoring systems and instrumentation to mining projects for nearly 40 years. Delivering the right solution for our customers.

As an Australian employee-owned company, we take pride in our work.

Given our experience, workshop facilities and product range, we can offer the following options:

- Custom built equipment and wherever possible parts sourced in Australia to reduce lead time.
- Dataloggers custom built and programmed to client's requirements.
- Flexibility to supply and install globally.

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