

Trecatti Landfill Site, Merthyr Tydfil.

Gas and Groundwater Monitoring Boreholes

Project Profile

Client: Biffa Waste Services Ltd

Value: £180k

9nr 250mm diameter boreholes were drilled on the periphery of the Trecatti landfill to depths of between 135m & 225m to allow deep gas and groundwater monitoring.

Previous attempts at completing this installation had failed due in part to the 50m depth of overburden in the backfilled opencast site but also the presence of heavily worked seams of ironstone and coal together with extensive faulted and fractured ground at deeper levels.

We drilled the boreholes using a Casagrande M9 'dual head' drilling rig. Dual Head' drilling offers a number of advantages over traditional drilling methods, including; achievement of drilling tolerances and hole accuracy, ability to drill fully cased holes as a one-pass operation to depths of over 150m, dealing with difficult and unstable drilling conditions (e.g. badly broken ground, sands & gravels & caving holes) and control over the environmental impacts of drilling including flush returns, dust, noise and vibration.

The rig is equipped with two high torque rotary drill heads mounted on slides with upper head being able to move up and down relative to the lower head. The upper head rotates the drill rods while the lower head rotates the casing. In the medium-hard formations to be encountered during drilling through the coal measures strata, broken ground and rock fill and to achieve adequate production rates, down the hole hammers and air/water mist flush is being used. Drilling is undertaken with an eccentric drilling system mounted on the down hole hammer in which the drill bit drills a slightly larger hole than the casing, which is drilled in immediately behind the drill bit.

Drill holes were fully cased to the base of the hole as the hole is drilled using 170mm ID casing. As the hole is cased concurrently with drilling, only the drilling face was exposed to flushing air/water mist. Furthermore, casing the hole as it is drilled guarantees flush returns to the full depth of the hole, including when drilling through broken ground or after drilling through voids.

These drilling rigs were also equipped with sophisticated cuttings collection systems for both dry or wet drill cuttings, via dust collector or enclosed wet cuttings skips, ensuring that nuisance during drilling operations was kept to an absolute minimum, but that also full cuttings returns could be analysed during borehole drilling.

This system of casing to the base of the hole ensured that holes did not collapse or become blocked prior to insertion of the gas and groundwater monitoring pipework.

On completion of the hole to full depth the monitoring pipework was inserted and the casing withdrawn to approx 28m above the base of the hole to allow a 25m response zone and 3m sump. The monitoring pipework was 110mm ID screwed plastic pipe with the response zone section 144 mm OD, having a pre-packed sand filter surround. The bottom 22m of the cased section of hole has a bentonite/OPC plug surrounding the plastic monitoring pipe.

