

CASE STUDY

BOWMAN'S HARBOUR LANDFILL CAP INVESTIGATION

PROJECT:

BOWMAN'S HARBOUR LANDFILL, WOLVERHAMPTON

PROJECT VALUE:

£27,000

PROJECT TIMESCALE: FOUR MONTHS

DATE AWARDED:

MARCH 2022

CHALLENGE:



ERS was commissioned by Vital Energy – a renewable energy solutions specialist – to undertake an intrusive ground investigation at the site to confirm the thickness and make-up of the landfill cap, obtain soil samples and perform in-situ geotechnical testing which would help inform the foundation design for the new solar farm.

PROJECT SCOPE:



Due to the status of the site as a closed landfill with active gas and leachate management systems, ERS agreed a Construction Quality Assurance (CQA) Plan with the Environment Agency in advance of the site investigation works.

Over 50 windowless sampler boreholes were drilled to map the cap thickness, inspect and log the capping materials and collect samples for geotechnical testing.

As the waste in the landfill was still actively gassing, extra care and additional gas monitoring was required to ensure there was no release of toxic or environmentally damaging gasses into the air as a result of the ground investigation activities. On completion of each borehole, concentrations of landfill gases were monitored for 3 minutes in the open borehole prior to sealing with a bentonite and cement mix.

Following the drilling and backfilling of the boreholes, bespoke CQA testing was carried out to show that the works had no impact on gas emissions or infiltration through the cap. ERS had proposed and agreed the backfill methodology and the CQA testing with the Environment Agency in advance of the works.

Infiltration testing and "fluxbox" gas emission monitoring was undertaken to prove that the drilling and backfilling hadn't compromised the landfill cap. Furthermore, a site wide gas emission survey was undertaken and compared to a similar survey undertaken prior to the drilling works.

OUTCOMES:



The fluxbox gas monitoring and emissions survey showed no methane emissions from the backfilled boreholes, and the infiltration testing showed the boreholes would not be a preferential pathway for rainwater into the cap. This confirmed that the site investigation did not impact the cap performance but also gave some reassurance that shallow driven piles could possibly be used for the solar array where the cap was sufficiently thick .

Following the ground investigation, Vital Energi was able to design a foundation solution comprising a mixture of pad and pile foundations and proceed with the construction of the solar farm.

The solar farm is expected to fully power the hospital's heat pump system for around 288 days per year, potentially saving the NHS Trust £15-20m over the next 20 years.
