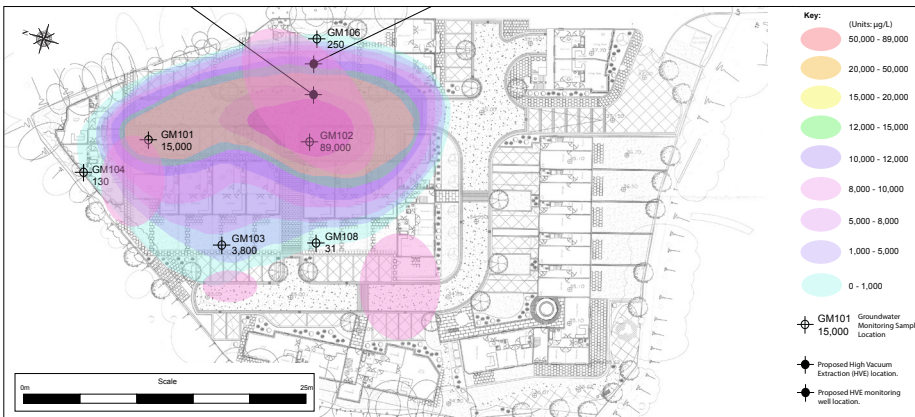


Remediation of DNAPL in a Sandstone Aquifer at a Former Bleaching Mill, UK

In situ treatment of bedrock under active construction site



Summary

Historically, this site had been used as a bleaching mill and the use of chlorinated solvents (PCE and TCE) there had resulted in contamination of the sandstone aquifer beneath. Concentrations of chlorinated solvents at the site suggested that DNAPL could be present. After a DPVE pilot trial proved unsuccessful, REGENESIS was approached to provide an alternative solution. By this time, the site was already under residential development and so REGENESIS had to provide an in situ solution that could be applied without disrupting the ongoing construction works. After evaluating the data REGENESIS recommended 3-D Microemulsion® (3DMe) to be applied across the site in a series of barriers.

Treatment

REGENESIS designed a widely spaced treatment array accommodating the existing footing of the houses under construction. This was possible due to the ability of 3DMe to self-distribute in the subsurface following application. This allows for very wide injection point spacing, minimising costs, disturbance and time on site, without compromising treatment integrity. Reducing the number of wells is particularly important on deep, bedrock sites such as this one, in order to minimise the drilling costs, which may otherwise be economically prohibitive.

REGENESIS worked closely with the Environmental Consultant, who oversaw the installation of the injection wells across the site. This was done to minimise the cost to the Developer and to take advantage of the knowledge gained by the Environmental Consultant during the site investigation. The injection works were completed by REGENESIS in 10 days, applying 73,000 L of 3DMe across 19 injection wells.

What's Special?

- Successful treatment of DNAPL in a bedrock
- Application completed on site already under construction
- Minimisation of the the number of wells through use of 3DMe's ability to self- distribute
- Worked closely with Environmental Consultant to realise the treatment onsite

Remediation Details

Site Type:

Residential construction site

Project Driver:

Redevelopment

Remediation Approach:

Bedrock injection on installed boreholes

Technologies:

3-D Microemulsion® (3DMe)

Geology

| | |
|---|---------|
| X | Bedrock |
| | Gravel |
| | Sand |
| | Silt |
| | Clay |

Medium

| | |
|---|----------------|
| X | Groundwater |
| | Saturated Soil |
| | Vadose Zone |

COC

| | |
|---|------------------|
| | Petro HCs |
| | Petro LNAPL |
| X | Chlorinated VOCs |
| | Metals |

COC Concentration Levels:

15,000 µg/L PCE
89,000 µg/L TCE
23,000 µg/L cis-DCE

Treatment Level: 5 - 15m BGL

Injection Grid: Series of barriers

Injection Points: 19

Remediation Cost: £80k