Site 6: Backsbottom Farm, Roeburndale

Site Assessment

Figure 1 Map showing general layout

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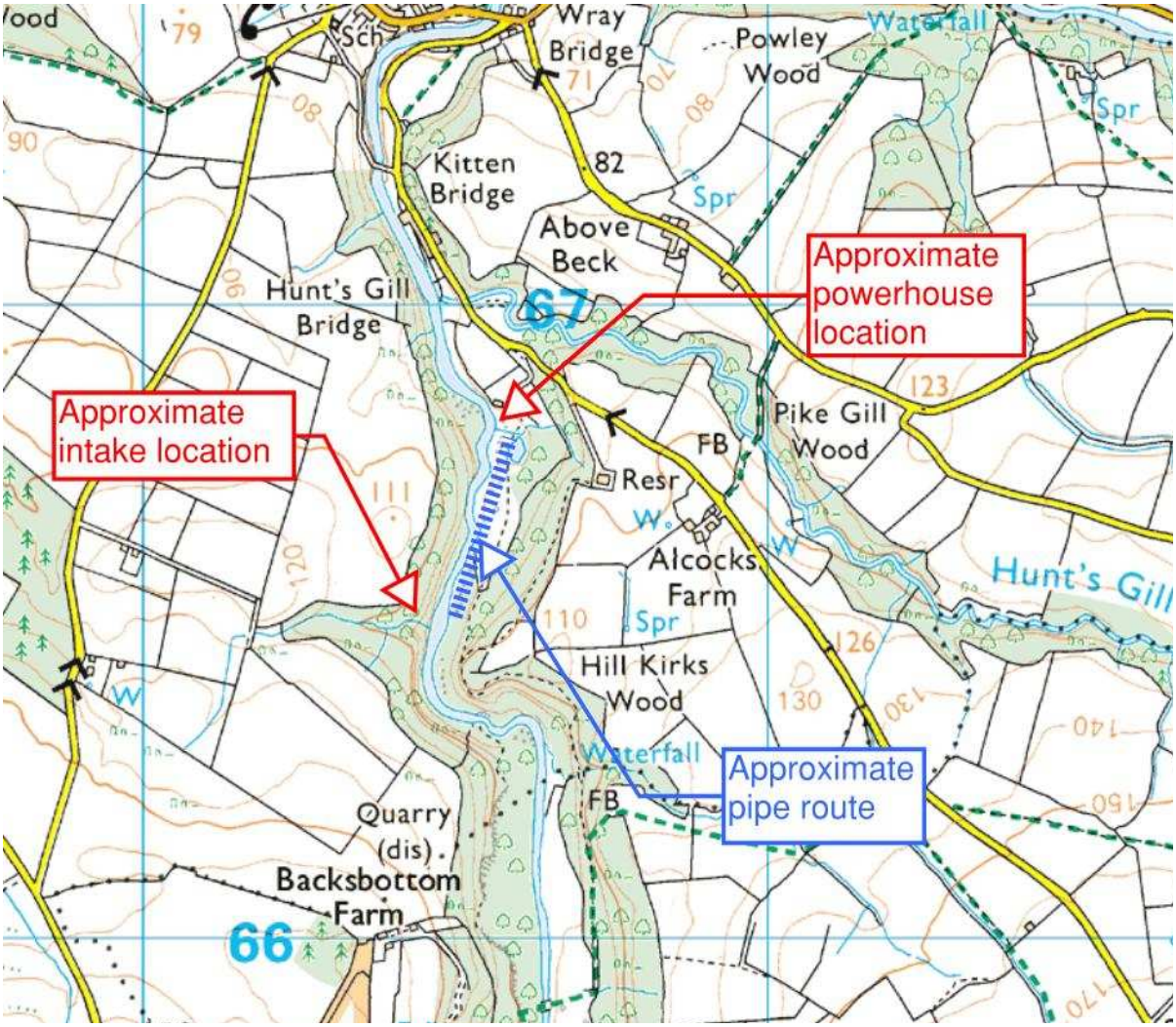


The land around Backsbottom Farm has good potential for a hydro scheme, with a couple of small streams as well as the River Roeburn. The site owner is very interested in harnessing hydro power and has already begun his own investigations into the site potential and its options. As a result of this, only the hydrology data is presented in this report. The developer proposes to test some unconventional technologies at the site which we are not able to assess

Figure 2 The smaller tributary

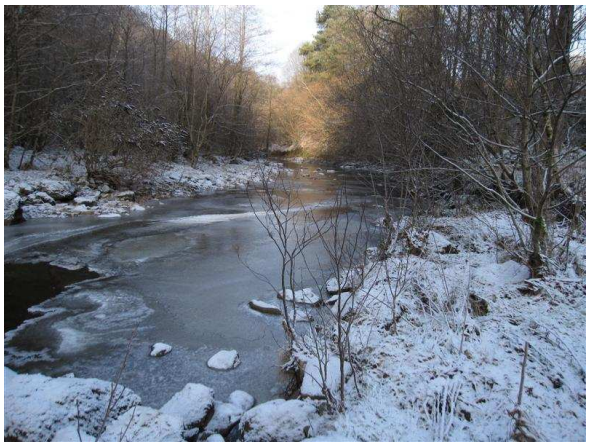
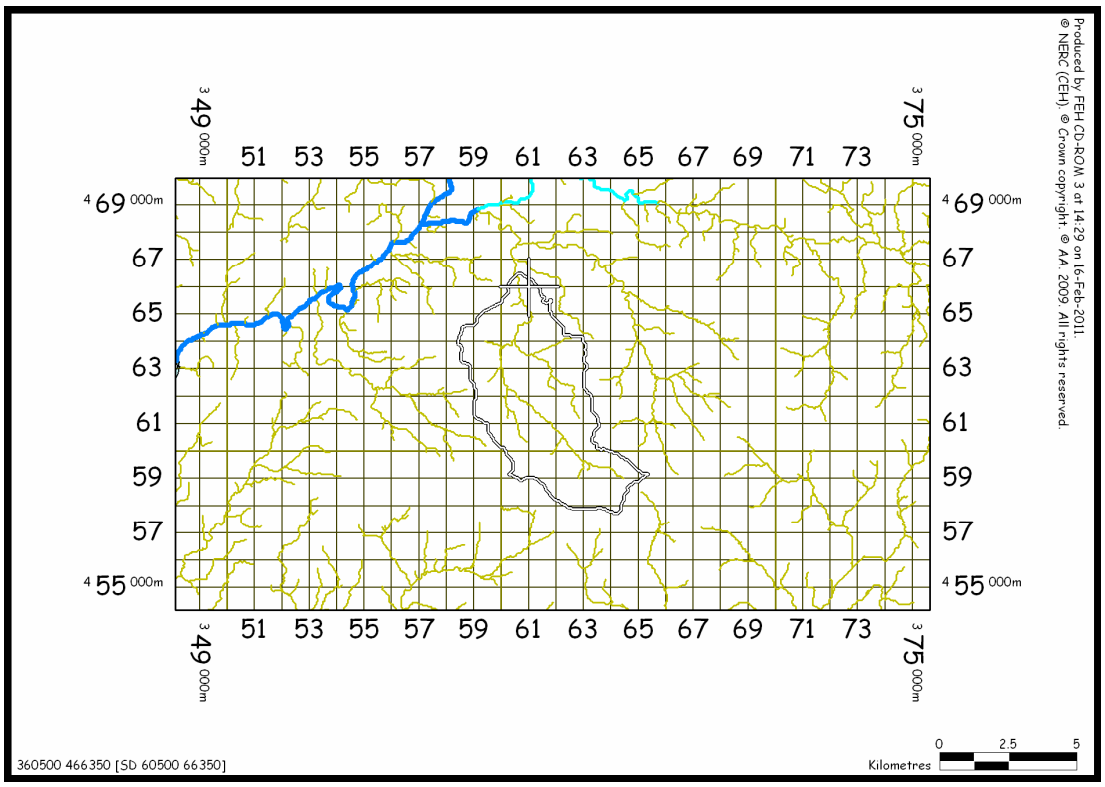


Figure 3 The river

Catchment Analysis

Figure 4 catchment boundary defined by Flood Estimation Handbook Software



The Flood Estimation Handbook software is used to determine the following catchment descriptors, for the proposed intake location, selected during the site visit.

Intake Grid Reference	360500 466400
Catchment Area	29.7 km^2
Annual Rainfall	1654 mm

Annual Flow Statistics

Low Flows software is used to produce a Flow Duration Curve (FDC), which demonstrates how the river flow varies throughout the year. It presents the percentage time of the year each flow rate is exceeded. A particular notation is used to refer to FDC flow rates; e.g. 'Q_{95}' refers to the flow rate which is exceeded 95% of the year.

Table 1 Mean flow rate and flow rate at Q_{95}

Period	Mean Flow Rate [m^3/s]	Flow Rate at Q_{95} [m^3/s]
Annual	1.271	0.163
January	1.920	0.340
February	1.212	0.208
March	1.583	0.300
April	0.905	0.174
May	0.671	0.158
June	0.497	0.120
July	0.632	0.130
August	0.928	0.142
September	1.209	0.166
October	1.514	0.189
November	1.981	0.289
December	2.206	0.373

Table 2 Annual flow duration data

Exceedance Probability	Flow Rate [m^3/s]
5	4.498
10	3.058
20	1.777
30	1.216
40	0.876
50	0.647
60	0.491
70	0.376
80	0.275
90	0.198
95	0.163
99	0.124

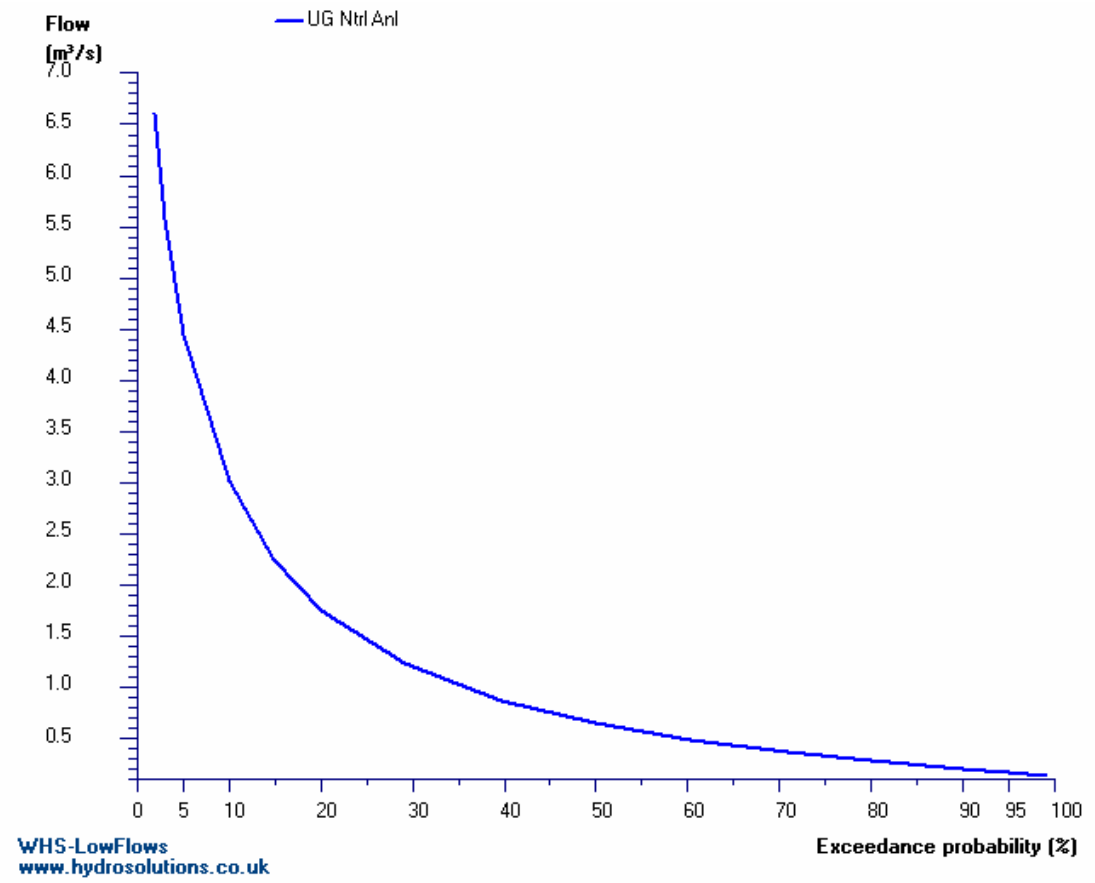


Figure 5 Annual flow duration curve produced using low flows software

Impact Assessment

Backsbottom Farm and associated land is within the Area of Outstanding Natural Beauty of the Forest of Bowland, and is classified in the landscape character assessment as Wooded Rural Valley.

The woodland on the east side of the River Roeburn is designated a Site of Special Scientific Interest. It is not envisaged that development will have any impact on this woodland. The whole wooded valley of Quarry Wood is a Biological Heritage Site.

The site owner understands that any development must be very sensitive to the surrounding environment, and with this in mind, is investigating using natural materials for construction.

Statutory Requirements

The developer will need to apply to the Environment Agency for an abstraction license and advice will need to be sought about planning permission. It will be necessary to consult with an ecologist to determine the extent of environmental investigation required before planning permission can be granted.

Budget Development Cost

It is understood that the landowners will complete any ground works and source their own materials for this scheme. With this in mind, it was decided that conventional costing methods were unrealistic and unsuitable.

Revenue and Simple Payback period

The landowners are underway with a scheme design at this site, using untested methods and technology. Therefore, our conventional methods of energy prediction were not deemed appropriate.

Conclusion

The developer is very keen to investigate further the hydro potential on this site, and will do so with careful consideration of the natural environment.

Further Information

This site report is produced by Inter Hydro Technology on behalf of Forest of Bowland AONB, and funded by a partnership including Lancashire County Council, Lancaster & District Local Strategic Partnership, Pendle Borough Council and Ribble Valley Local Strategic Partnership.

This site report should be read in conjunction with the rest of the Forest of Bowland AONB Hydro Feasibility Study which can be downloaded at

http://www.forestofbowland.com/climatechange#hydro