FORM WRB: Hydropower pre-application enquiry

Water Resources Act 1991 (as amended by the Water Act 2003), Environment Act 1995, The Water Resources (Abstraction and Impounding) Regulations 2006, The Natural Resources Body for Wales (Functions) Order 2012

Cyfoeth Naturiol Cymru Natural Resources Wales

For hydropower pre-application enquiries, complete this form and form WRA to enable us to assess your proposal. Before you complete this form, please ensure you have read all of the hydropower guidance notes relevant to your scheme on our website with particular reference to Hydropower Guidance Note 2 (HGN2): Hydropower Flow Standards.

1. Site description

Provide 12 digit National Grid References for the following points:	
Abstraction point(s)	SH 76171 45680
Discharge point(s)	SH 76539 46262
Existing or proposed impoundment(s)	Proposed, as PAN-003016 & 003017
State the length of depleted reach (in metres)	800

Provide a description of any existing or proposed impoundments, including any planned changes to existing structures. If necessary, please reference any additional documents or continue on a separate sheet and tick here to show that you have done so. ☐

Please see **Wier design details v3a.pdf**, **HyR proposal v8.pdf** and **Justification of extraction rates.pdf** (attached, as PAN-003016/7 applications).

If you are proposing to raise the level of an existing impoundment, provide this difference (in millimetres).

2. Scheme details

% abstraction and zone applied for (see HGN2)	Average gradient of depleted reach (%)	Catchment size above abstraction point (kilometres squared)	Net head between abstraction and discharge points (metres)
33.3% zone 3	19%	0.865	150
Turbine efficiency (%)	**System efficiency (%)**	**Maximum power output (kilowatts)**	**Annual capacity (kilowatt hours)**
83	66	10.2 (gross)	34900

3. Abstraction quantities

Provide details of the abstraction quantities proposed, including any deregulated abstractions (< 20 cubic meters per day) you currently have.

Abstraction location name / reference	Number of days abstraction per year	Maximum annual abstraction volume (cubic metres)	Maximum daily abstraction volume (cubic metres)	Maximum hourly abstraction volume (cubic metres)	Peak abstraction rate (litres per second)
Afon y Foel (hydro)	365	293000	1279	53.3	14.8
Afon y Foel (domestic)	365	314	1.48	0.4	0.3
	Total	2933314	1280.48	53.7	

Please show us how you have calculated these quantities or reference any supporting information submitted. If necessary, continue on a separate sheet and tick here to show that you have done this. ☐

(same as PAN-003016 & 7)

4. Flow data

Provide the flow data (in cubic metres per second) & ratios specified below:	
Q95	0.004 m^3/s
Q10	0.155 m^3/s
Qmean	0.058 m^3/s
What is the ratio of Q95:Qmean?	0.069
What is the ratio of Q10:Qmean?	2.67

Please send us a copy of the full flow duration curve for the site and confirm the method used to derive this.

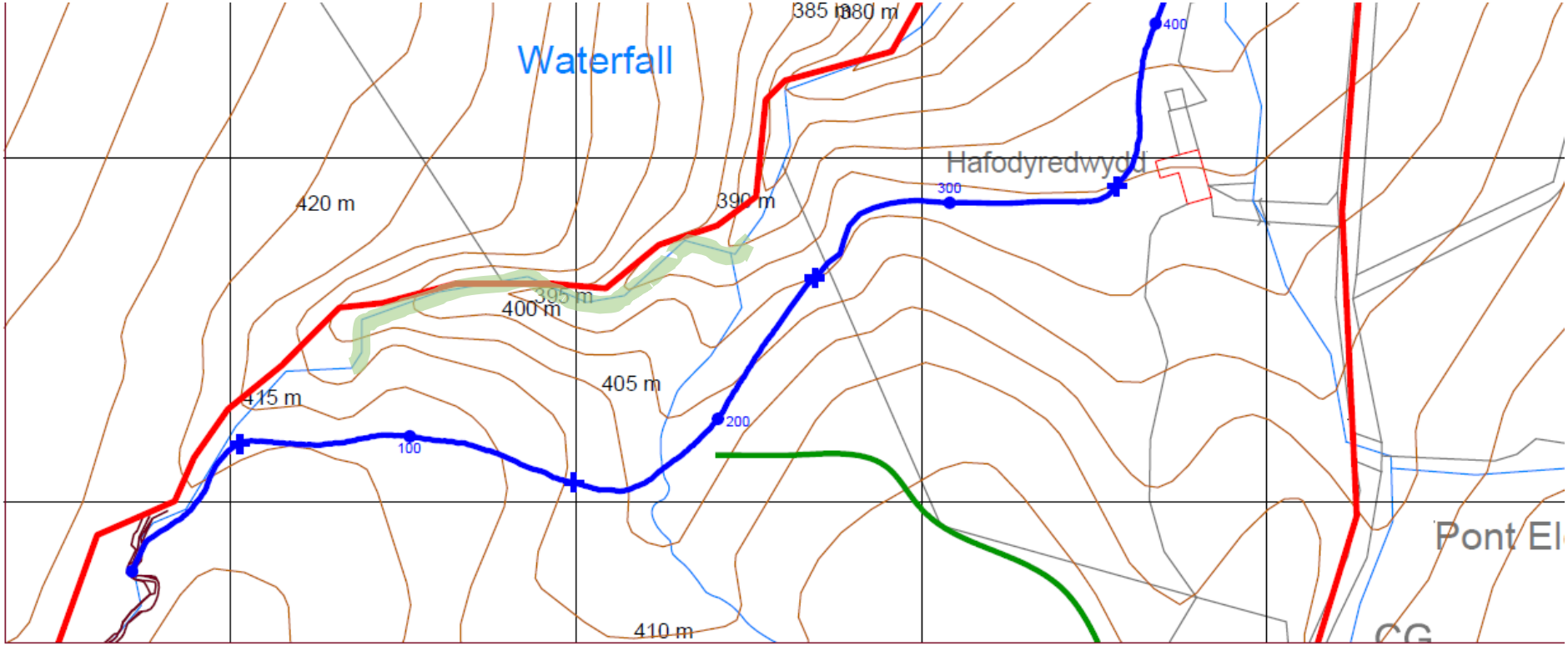
If you have used modelling software such as LowFlows, please provide us with a copy of the output (graph, data and catchment map) including the Long Term Average rainfall.

What low flow protection* do you propose to maintain in the depleted reach when the hydropower scheme is operating (in m^3/s)?
* Low flow protection is the flow rate above which abstraction can begin and is separate to the abstraction % take, see HGN2 for details.

The proposed extraction is currently limited by the use of a stepped weir and two Coanda screens, with an orifice limiting the extraction via the dry-weather screen (as agreed, PAN-003016). I now propose (a) that use of this orifice flow for hydro power be permitted (currently domestic water only) and (b) that an environmentally-safe hydro extraction rate beyond Q95 be agreed, as proposed in my emails to Charlotte Lilywhite (6/8/2019 and 23/7/2020).

Ideally I would like to take 15% of stream flow for hydro power in the Q95 to Q99.9 interval, with hands-off beyond Q99.9, possibly subject to a demonstration that spraying a fine mist into the upper end of the depleted reach can mitigate any loss of humidity due to a slight reduction in stream flow over a stretch of approximately 120 m through the “steep-sided valley” (Geomorphology survey); beyond this point a tributary joins and raises the stream flow. In wet weather there are numerous waterfalls down this stretch and the splashing from these must contribute to the humidity; an artificial spray could mimic this effect when the waterfalls trickle without enough water to splash. The enhanced area would be as shown by the green shading below (map excerpt from HyR_190303A-south.pdf; 100 m grid squares), probably continuing to a lesser extent down the rest of the depleted reach.

[15% corresponds to the originally proposal’s 0.6 L/s, as a fraction of the 4 L/s Q95 stream flow].



5. Fish and eel considerations

Complete the table below to show how you propose to protect the fisheries interests of the watercourse. See HGN8 (Fish Passage) and HGN9 (Fish Screening) for more details.

	Intake	Outfall
Type of fish screen	Coanda screen	Mesh
Screen aperture size	1 mm	10 mm
Means of upstream fish/eel passage	3-stage fish jump	
Means of downstream fish passage	n/a	

If no measures are proposed, provide justification of this. If necessary, please continue on a separate sheet and tick here to show that you have done this. ☐

6. Planning application

Have you sought advice on your planning application?

No ☐ Yes ☒

If yes, submit a copy of the Planning Authority's response.

- Planning consent NP4/29/44B granted 27/3/2019

7. Declaration

Please see Guidance Note WRX for details of who can sign this section and note the information in that document relating to the Data Protection Act 1998.

By signing below, you are declaring that as far as you know and believe the information given in this form, on any map and in any supporting or additional information, is true.

Signed	
Print name	R.W.Moss
Position	Cottage owner, engineer
Date	24th August 2020

Application Checklist

Please tick the following checklist items to indicate that you have included the required information. If any sections of the form are left blank and no supporting

information submitted, where we have insufficient information to make a decision on your application, we will return your application to you.

Essential:

A map showing the land ownership boundary with all abstraction and discharge point(s) and your proposed pipeline route clearly marked ☐

Stage 1 photo survey - see HGN10 Geomorphology for further details ☐

Full flow duration curve for the site, confirmation of the method used to derive this and a copy of the output (graph, data and catchment map) including the Long Term Average rainfall, where available ☐

State number of continuation sheets (enter 0 if none included) ☐

Where relevant:

Letter of authorisation from the applicant, allowing the agent to act as signatory ☐

Planning Authority response, where available ☐

Additional supporting information - please list below: