Form WRD: Application for a new abstraction licence or a technical variation to an abstraction licence

Application type

Reference number (The number you generated in form WRA). Example: WRNATURALRESOURCESWALES1101
WRERWFAETHLON1123

For hydropower abstractions, specify the capacity (in kilowatts) of your scheme.
25kW or less

Are there any applications currently being assessed by us that are linked to this application?
No

Is the proposed abstraction going to be aggregated with another existing abstraction?
No

Are any applications, at the same site; being assessed by the Environment Agency?
No

Tell us when you want your abstraction licence to end: [DD/MM/YY]
As long as possible please

Abstraction details

Abstraction location name/reference
Intake

Abstraction point type
Single point

National Grid Reference
SN 63033 99339

Do you have any further points of abstraction?
No

Means of abstraction

Provide full details of the equipment you propose to use to abstract water, such as maximum pump capacity and any relevant dimensions, e.g. pipe diameter. For groundwater abstractions, include details about the borehole (depth and diameter) and details of screening and lining.
A small intake weir with an overshot coanda screen. Pipe diameter will be 200mm max,

Please upload your drawings and calculations here. (Spreadsheet file formats need to be: .xls, .xlsx, or .ods)
• File: Intake RevA.pdf - Download

Abstraction quantities

Abstraction location name/reference
Intake

What purpose will the water be used for?
Hydropower

Period of abstraction Will it be all year?
Yes

Maximum quantities (cubic metres)	
Annual	473000
Daily	1296
Hourly	54

Peak abstraction rate (in litres per second)
15

Number of hours of abstraction per day
24

Add quantities for another location?
No

Calculations and supporting information

Use this section to show us how you have calculated the amount of water you require. This should include details of your operational regime (for example, number of hours and days you intend to abstract, number of units produced or area to be irrigated). We use this information to determine if the volumes you propose to abstract are appropriate for the purpose. Depending which industry you are in, you may need to provide additional information below.

If your proposal involves the provision of a residual flow via a notch or orifice, provide information on how this is being calculated. This should include details of the equation being used.

A run of Low Flows has been carried out for the site. This gives a mean flow of 15l/s. This is a Zone 3 abstraction thus the abstraction rate is equal to the mean flow and the percentage take of available flow is 70%. The attached spreadsheet has 2 sheets:

The 'Flow Modelling' sheet shows how the flow duration curve was obtained from a run of Low Flows scaled for a smaller catchment area. This gives a Qmean of 0.015m3/s and Q95 of 0.002m3/s.

The 'Flow Split Calculations' sheet shows how the flow split of 70% abstraction above Q95 was calculated using the weir equation for different parts of the weir.

Additional document. (Spreadsheet file formats need to be: .xls, .xlsx, or .ods)

- File: Flow calculations spreadsheet.xlsx - Download
- File: Turbine House RevA.pdf - Download
- File: Outline Method Statement Rev A.pdf - Download
- File: Erw Faethlon Micro Hydro Supporting Info for NRW Application Rev A.pdf - Download
- File: Erw Faethlon HEP survey.pdf - Download

Industry-specific requirements

	% abstraction and zone applied for	Average gradient of depleted reach (%)	Catchment size above abstraction point (kilometres squared)	Net head between abstraction and discharge points (metres)
	70% Zone 3	13.3%	0.598	81

	Turbine efficiency (%)	System efficiency (%)	Maximum power output (kilowatts)	Annual capacity (kilowatt hours)
	85	74	9	30000

State the length of depleted reach (in metres)

610

Provide the flow data (in cubic metres per second) & ratios specified below:

Q95	0.002m3/s
Q10	0.0342m3/s
Qmean	0.015 m3/s
What is the ratio of Q95:Qmean?	0.133
What is the ratio of Q10:Qmean?	2.28

What low flow protection (Low flow protection is the flow rate above which abstraction can begin and is separate to the abstraction % take) do you propose to maintain in the depleted reach when the hydropower scheme is operating (in m3/s)?

Q95+30%

Means of measurement

State how you intend to measure the quantity of water you abstract. You do not need to do this for a temporary or transfer licence.

Power Generated

Water efficiency

Provide details of what measures you provide or intend to implement, to ensure efficient use of water. This could include water storage, re-use or recirculation, monitoring and checking for leaks, undertaking water audits or other industry specific good practice.

Automatic control system to ensure water does not get wasted. Regular checks for leaks in the turbine house. Annual pipeline leak test

Fish and eel considerations (surface water abstractions only)

Does your proposal include measures to safeguard fish and eels? Only provide details of outfall screening if abstracted water is to be discharged back into a watercourse. For further guidance on appropriate screening Intake screening for fish

	Intake	Outfall
Type of fish screen	Coanda	Bar
Screen aperture size (mm)	3	40

Confirm the fish species present at your site. If you're not proposing any measures to protect fish and eels, you must justify this. For example, we may have confirmed in our pre-application response that the intake is inaccessible to fish or you undertook a fish survey to confirm.

The stream is extremely steep for the whole deprived reach (average slope is over 13%) therefore it is assumed there is no spawning habitat for migratory species. A plunge pool and chain for eel passage have been included in the design to safeguard any species that could be present.

Discharge details

If you intend to return any of the abstracted water to the environment, provide details below. Details of discharge location(s) should correspond with any maps submitted. Do not include discharges to a public sewage system.

	Discharge location name / reference	National Grid Reference of discharge point (12 digit)	Total volume to be discharged (cubic metres)	Environmental Permit for Water Discharge Activity number (if applicable)
	Outfall	SN 62762 98820	All abstracted water	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

Provide a description of the structure and equipment involved in discharge.

Water drops from turbine directly through turbine house floor into the stream with a 40mm bar screen to prevent any possibility of any wildlife coming into contact with the turbine runner. Please refer to drawing.

Other abstractors / water users

Provide details of nearby abstractors or users of water who could be affected by your proposal. This should include deregulated users (exempt activities or abstractions < 20 cubic metres per day), anglers and canoeists.
Your local authority's environmental health will hold details of exempt domestic abstractors.

No other users

Planning application

Have you sought advice on your planning application?
No

Declaration

By signing below, you are declaring that, to the best of your knowledge; the information given in this form, on any map and in any supporting or additional information; is true.	
Signed	Mari Evans
Print name	Mari Evans
position	Owner and applicant

Date
* 16/11/2023

Would you like a copy of your submission?
Yes

Your email address
nick@nbhydro.co.uk