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
CRNC2801

For hydropower abstractions, specify the capacity (in kilowatts) of your scheme.
>25 hyd at 50kW

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:
A lot of the infrastructure (HDPE pipe and concrete) will have a lifespan of over 50 years therefore as long as possible please

Abstraction details

Abstraction location name/reference
Nant Llyn Glan Gors, Llanrhychwyn, Trefriw, Llanrwst

Abstraction point type
Single point

National Grid Reference
SH 78255 61608

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.

Small concrete intake weir, coanda or wedge wire screen and 315mm OD pipe

Please upload your drawings and calculations here. (Spreadsheet file formats need to be: .xls, .xlsx, or .ods)

- File: Intake and GA v2.pdf - Download
- File: Powerhouse Dimensions and GA V3.0.pdf - Download
- File: Flow Abstraction Calculations V1.pdf - Download
- File: Nant Llyn Glan Gors at (278250, 361600).pdf - Download

Abstraction quantities

Abstraction location name/reference

Nant Llyn Glan Gors, Llanrhychwyn, Trefriw, Llanrwst

What purpose will the water be used for?

Hydropower

Will it be all year?

Yes

Maximum quantities (cubic metres)

Annuak	2131831
Daily	5841
Hourly	243.36

Peak abstraction rate (in litres per second)

67.6

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 67.6l/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 '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 Abstraction Calculations V1.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	24%	1.582	86.9

	Turbine efficiency (%)	System efficiency (%)	Maximum power output (kilowatts)	Annual capacity (kilowatt hours)
	85	75	43	378466

State the length of depleted reach (in metres)
370m

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

Q95	0.0057m3/s
Q10	0.158m3/s
Qmean	0.0676m3/s
What is the ratio of Q95:Qmean?	0.08432
What is the ratio of Q10:Qmean?	2.337278

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.

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

All water is returned to the water course and annual checks for leaks in the system

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.

Due to the size of the stream and for the entire length of the deprived reach - average gradient is over 20%, therefore there is no spawning habitat for migratory species. 300mm plunge pool and chain for eel passage have been included.

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	SH 78601 61575	All abstracted water	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

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

Water will be returned (450mm twin wall pipe) to the watercourse from the powerhouse with a 40mm screen to stop any wildlife entering the turbine.

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.

There are no registered abstractions on the watercourse. There are 2 domestic supplies (<20 cm3 per day) on the watercourse and they will not be impacted - When the hydro is operating there will be a minimum of 985 cubic meters per day residual in the watercourse. One domestic supply is lower in the watercourse and there is a 1% increase in the catchment size compared to the intake location, therefore at Q32 there will be an additional 58 cubic metres per day residual.

Planning application

Have you sought advice on your planning application?

Yes

Submit a copy of the Planning Authority’s response.

- File: NP4-32-358A pre-app.pdf - Download

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	Geraint Jones
Print Name	Geraint Jones
Position	Company Secretary

Date

* 28/01/2025

Would you like a copy of your submission?

Yes

Your email address

gerbodchwil@googlemail.com