

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

WRDIMBATH0505

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

Abstraction details

Abstraction location name/reference

Intake 2

Abstraction point type

Single point

National Grid Reference

SS 95373 89108

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.

The abstraction will take place at Intake 2, shown on the site layout. There is a manmade pond on the watercourse at this location. Water will be abstracted from the pond via a penstock (180mm diameter pipe) which connects this pond to the turbine. In the pond, the penstock's entry is screened by a steel cage with 3mm perforations.

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

- File: 21102801-v2 Dimbath Intake 2 Elevations and HOF calcs.pdf - [Download](#)
- File: 21102802 Dimbath Intake 2 General Layout.pdf - [Download](#)
- File: 21102702-v2 Dimbath Outfall.pdf - [Download](#)

Abstraction quantities

Abstraction location name/reference

Intake 2

What purpose will the water be used for?

Hydropower

Period of abstraction Will it be all year?

Yes

Maximum quantities (cubic metres)

Annual 567648

Daily 1555.2

Hourly 64.8

Peak abstraction rate (in litres per second)

18

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.

See the uploaded document "Dimbath Hydrology Assessment, FDC & catchments V2" which gives detail about the turbine's net head, power and annual energy generation. The document also shows the flow duration curves for both watercourses and the impact of the abstractions from each as well as the combined turbine requirement shown below.

Abstraction quantities (total requirement for the turbine):

Design Flow (Max Instantaneous Abstraction Flow): 18.0l/s

Max hourly abstraction (Design flow x 3600 sec): 64.8m³

Max daily abstraction (Max hourly abstract x 24h): 1,555.2m³

Max Annual abstraction (Max Daily Abstraction x 365 days): 567,648m³

The intake will have a rectangular 'Hands Off Flow' notch and the formula used is: $Flow\ Q = C_d * w * h^{1.5}$

Discharge coefficient, $C_d = 1.6$

Notch depth, $h = 0.022m$

Notch width, $w = 0.1m$

$Q = C_d * w * h^{1.5}$

$= 1.6 * 0.1 * 0.022^{1.5} = 0.00052\ m^3 / sec$

$= 0.52\ lps$

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

- File: Dimbath Hydrology Assessment, FDC & catchments V2.pdf - [Download](#)
- File: 211010 Intake 2 Spot Gaugings & FDC.pdf - [Download](#)
- File: Intake 1 Geomorphology Photo Survey.pdf - [Download](#)
- File: Intake 2 Geomorphology Photo 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)
	100% Zone 3	11%	0.095	Intake 2 to Turbine: 135m

	Turbine efficiency (%)	System efficiency (%)	Maximum power output (kilowatts)	Annual capacity (kilowatt hours)
	87%	78.3%	18.5kW	53,000

State the length of depleted reach (in metres)

1290

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

Q95 0.0005
Q10 0.010
Qmean 0.005
What is the ratio of Q95:Qmean? 0.11
What is the ratio of Q10:Qmean? 1.94

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)?

0.0005

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.

A high efficiency turgo turbine is proposed.

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	Perforated steel	Vertical flat bar
Screen aperture size (mm)	3mm	30mm

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.

Brown trout.

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	SS 94954 88198	All the abstracted water	N/A
	-	-	-	-
	-	-	-	-
	-	-	-	-

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

A 450mm plastic pipe (tailrace) captures the discharged water below the turbine. The water is then discharged from this pipe via a 30mm vertical bar screen and a head wall. It discharges into a pond, which dissipates the kinetic energy. It then spills over the pond wall to the Nant Lechyd watercourse at NGR SS 94954 88198.

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.

None

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 Helen Platel

Print name Helen Louise Platel

position Partner

Date

* 05/05/2022

Would you like a copy of your submission?

Yes

Your email address

helen.platel@googlemail.com