Project Name: Dimbath Hydro - Energy Output Assessment (for both watercourses combined)

Combined Abstraction from Intake 1 & Intake 2 [l/s]	Penstock Headloss [m]	Combined Turbine & Generator Efficiency [%]	Power output [kW]	Yield [kWh]
18.0	3.00	78.3%	18.67	8,175
18.0	3.00	78%	18.67	8,175
18.0	3.00	78%	18.67	8,175
14.6	2.05	77%	15.03	6,585
11.9	1.39	77%	12.27	5,376
9.1	0.85	76%	9.30	4,071
7.6	0.60	73%	7.45	3,263
6.1	0.40	70%	5.72	2,506
5.1	0.29	67%	4.64	2,031
4.2	0.20	63%	3.57	1,563
3.6	0.15	59%	2.85	1,248
3.0	0.11	53%	2.12	927
2.5	0.07	45%	1.50	655
2.0	0.05	35%	0.93	407
1.5	0.03	23%	0.48	210
1.1	0.02	8%	0.12	53
0.0	0.00	0%	0.00	0
0.0	0.00	0%	0.00	0
0.0	0.00	0%	0.00	0
0.0	0.00	0%	0.00	0
			Annual Totals	53,420
			Turbine down time for maintenance in days per year	5
			Estimated annual generation in kWh	52,688
			Capacity Factor	32%

Aggregate statistics & abstraction quantities (both watercourses combined):

Gross Head (Static Head):	138.0	m
Net Head (Dynamic Head) at Design Flow:	135.0	m
Design Flow (Aggregate Max Instantaneous Abstraction Flow)	18.0	l/s
Min Turbine Flow as %age of max flow	5%	
Min Turbine Flow	1	l/s
Max hourly abstraction (Design flow x 3600 sec)	64.8	m3
Max daily abstraction (Max hourly abstract x 24h)	1,555.2	m3
Max Annual abstraction (Max Daily Abstraction x 365 days)	567,648	m3

Project Name: Dimbath Hydro - Abstraction at Intake 1 (unnamed tributary to Nant Lechyd)

% Exceedance Probability	Flow upstream of abstraction [l/s]	Abstraction [l/s]	Abstraction as percentage of upstream flow	Residual flow downstream of weir [l/s]	Residual flow as percentage of upstream flow
5%	39.7	13.0	32.8%	27	67.2%
10%	26.6	13.0	48.9%	14	51.1%
15%	20.9	13.0	62.1%	8	37.9%
20%	15.3	9.6	63.1%	6	36.9%
25%	12.6	7.8	61.7%	5	38.3%
30%	10.0	6.0	59.5%	4	40.5%
35%	8.6	5.0	57.8%	4	42.2%
40%	7.2	4.0	55.3%	3	44.7%
45%	6.3	3.3	53.3%	3	46.7%
50%	5.4	2.7	50.6%	3	49.4%
55%	4.8	2.3	48.2%	2	51.8%
60%	4.2	1.9	45.2%	2	54.8%
65%	3.8	1.6	42.1%	2	57.9%
70%	3.3	1.3	38.2%	2	61.8%
75%	2.9	1.0	33.9%	2	66.1%
80%	2.5	0.71	28.2%	2	71.8%
85%	2.2	0.5	21.5%	2	78.5%
90%	1.8	0.2	12.3%	2	87.7%
95%	1.5	0.0	0.0%	1	100.0%
100%	1.0	0.0	0.0%	1	100.0%

Catchment area:	0.261	km2
Run-off:	1585	mm
Mean Flow (Qmean)	13	l/s
Abstraction regime (Percentage take above HOF)	70%	
Hands Off Flow (HOF) Exceedance	95%	
Hands Off Flow (HOF)	1.5	l/s
Max instantaneous abstraction flow	13	l/s
Q95/Qmean Ratio (see FDC above)	0.11	
Q10/Qmean Ratio (see FDC above)	2.05	
Max hourly abstraction (Design flow x 3600 sec)	46.8	m3
Max daily abstraction (Max hourly abstract x 24h)	1,123.2	m3
Max Annual abstraction (Max Daily Abstraction x 365 days)	409,968	m3

Project Name: Dimbath Hydro - Abstraction at Intake 2 (pond)

% Exceedance Probability	Flow upstream of abstraction [l/s]	Abstraction [l/s]	Abstraction as percentage of upstream flow	Residual flow downstream of weir [l/s]	Residual flow as percentage of upstream flow
5%	14.4	5.0	34.6%	9	65.4%
10%	9.7	5.0	51.7%	5	48.3%
15%	7.6	5.0	65.6%	3	34.4%
20%	5.6	5.0	89.9%	1	10.1%
25%	4.6	4.1	89.1%	1	10.9%
30%	3.6	3.1	86.3%	1	13.7%
35%	3.1	2.6	84.0%	1	16.0%
40%	2.6	2.1	80.8%	1	19.2%
45%	2.3	1.8	78.1%	1	21.9%
50%	2.0	1.5	74.5%	1	25.5%
55%	1.8	1.3	71.4%	1	28.6%
60%	1.5	1.0	67.5%	1	32.5%
65%	1.4	0.9	63.5%	1	36.5%
70%	1.2	0.7	58.3%	1	41.7%
75%	1.1	0.6	52.6%	1	47.4%
80%	0.9	0.4	45.1%	1	54.9%
85%	0.8	0.3	36.3%	1	63.7%
90%	0.7	0.2	24.2%	1	75.8%
95%	0.5	0.0	5.7%	1	94.3%
100%	0.4	0.0	0.0%	0	100.0%

Catchment area:	0.095	km2
Run-off:	1571	mm
Mean Flow (Qmean)	5	l/s
Abstraction regime (Percentage take above HOF)	100%	
Hands Off Flow (HOF) Exceedance	95%	
Hands Off Flow (HOF)	0.5	l/s
Max instantaneous abstraction flow	5	l/s
Q95/Qmean Ratio (see FDC above)	0.11	
Q10/Qmean Ratio (see FDC above)	1.94	
Max hourly abstraction (Design flow x 3600 sec)	18.0	m3
Max daily abstraction (Max hourly abstract x 24h)	432.0	m3
Max Annual abstraction (Max Daily Abstraction x 365 days)	157,680	m3

Flow Duration Curves for Dimbath Hydro (unnamed tributaries to the Nant Lechyd)

Transposing & Scaling' method using Cynon at Abercynon as the donor site.

Intake 1&2' Combined			
	P (%)	Q (m³/s)	Q (l/s)
1	5	0.05411	54.11
2	10	0.03627	36.27
3	20	0.02083	20.83
4	30	0.01364	13.64
5	40	0.00975	9.75
6	50	0.00736	7.36
7	60	0.00577	5.77
8	70	0.0045	4.5
9	80	0.00342	3.42
10	90	0.00248	2.48
11	95	0.00198	1.98
12	99	0.00142	1.42

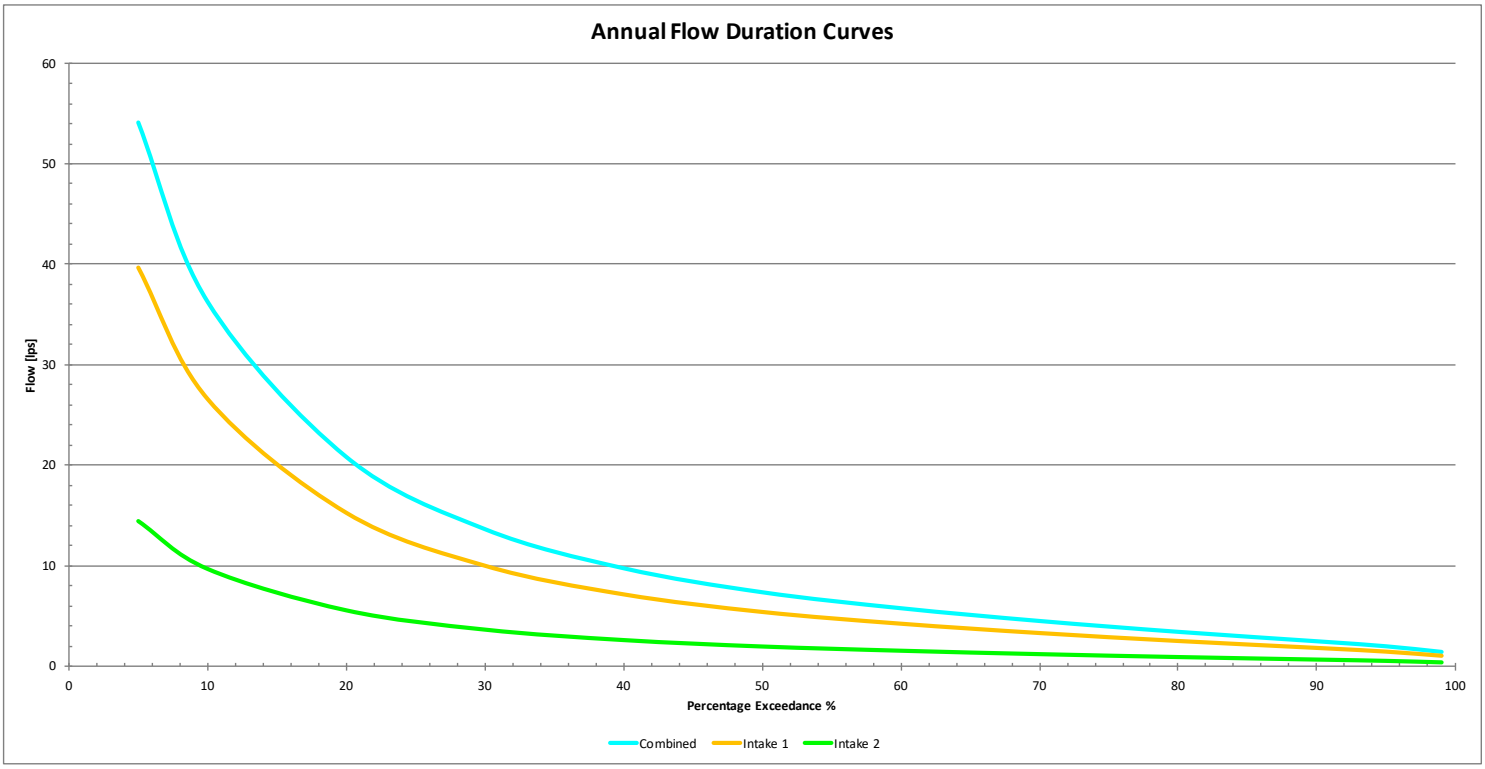
LowFlows Runoff	1578	mm	Mean Flow (l/s)
LowFlows Rainfall	1928	mm	18.0
Catchment Area	0.356	km2	
BFI			
LowFlows Map	58		

Intake 1' - Unnamed Tributary to the Nant Lechyd			
	P (%)	Q (m³/s)	Q (l/s)
1	5	0.03967	39.67
2	10	0.02659	26.59
3	20	0.01527	15.27
4	30	0.01	10
5	40	0.00715	7.15
6	50	0.0054	5.4
7	60	0.00423	4.23
8	70	0.0033	3.3
9	80	0.00251	2.51
10	90	0.00182	1.82
11	95	0.00145	1.45
12	99	0.00104	1.04

Intake 2 Runoff	1585	mm	Mean Flow (l/s)
Intake 2 Rainfall	1935	mm	13.0
Intake 2 catchment area	0.261	km2	
Project Site's BFI	0.46		
Donor Site's BFI	0.4		

Intake 2' - Pond on unnamed tributary to the Nant Lechyd			
	P (%)	Q (m³/s)	Q (l/s)
1	5	0.01444	14.44
2	10	0.00968	9.68
3	20	0.00556	5.56
4	30	0.00364	3.64
5	40	0.0026	2.6
6	50	0.00196	1.96
7	60	0.00154	1.54
8	70	0.0012	1.2
9	80	0.00091	0.91
10	90	0.00066	0.66
11	95	0.00053	0.53
12	99	0.00038	0.38

Intake 2 Runoff	1571	mm	Mean Flow (l/s)
Intake 2 Rainfall	1921	mm	5.0
Intake 2 catchment area	0.095	km2	
Project Site's BFI	0.5		
Donor Site's BFI	0.4		



Catchment areas