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Unit 6 Neepsend Triangle Business 1 Burton Road Sheffield S3 8BW	Garage Site, The Glebe West Drayton Surface Water Attenuation	
Date 25/03/2019 File CELLULAR CRATE ATTENUATION	Designed by S. Griffiths Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 18 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	9.273	0.273	0.0	2.6	2.6	3.6	O K
30 min Summer	9.329	0.329	0.0	2.9	2.9	4.4	O K
60 min Summer	9.334	0.334	0.0	2.9	2.9	4.4	O K
120 min Summer	9.294	0.294	0.0	2.7	2.7	3.9	O K
180 min Summer	9.251	0.251	0.0	2.5	2.5	3.3	O K
240 min Summer	9.215	0.215	0.0	2.3	2.3	2.9	O K
360 min Summer	9.164	0.164	0.0	1.9	1.9	2.2	O K
480 min Summer	9.131	0.131	0.0	1.7	1.7	1.7	O K
600 min Summer	9.109	0.109	0.0	1.5	1.5	1.4	O K
720 min Summer	9.093	0.093	0.0	1.4	1.4	1.2	O K
960 min Summer	9.074	0.074	0.0	1.2	1.2	1.0	O K
1440 min Summer	9.059	0.059	0.0	0.9	0.9	0.8	O K
2160 min Summer	9.048	0.048	0.0	0.6	0.6	0.6	O K
2880 min Summer	9.042	0.042	0.0	0.5	0.5	0.6	O K
4320 min Summer	9.034	0.034	0.0	0.4	0.4	0.4	O K
5760 min Summer	9.029	0.029	0.0	0.3	0.3	0.4	O K
7200 min Summer	9.027	0.027	0.0	0.2	0.2	0.4	O K
8640 min Summer	9.025	0.025	0.0	0.2	0.2	0.3	O K
10080 min Summer	9.024	0.024	0.0	0.2	0.2	0.3	O K
15 min Winter	9.308	0.308	0.0	2.8	2.8	4.1	O K
30 min Winter	9.370	0.370	0.0	3.1	3.1	4.9	O K
60 min Winter	9.365	0.365	0.0	3.0	3.0	4.9	O K
120 min Winter	9.298	0.298	0.0	2.7	2.7	4.0	O K
180 min Winter	9.236	0.236	0.0	2.4	2.4	3.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	5.7	23
30 min Summer	90.705	0.0	7.5	31
60 min Summer	56.713	0.0	9.4	48
120 min Summer	34.246	0.0	11.3	80
180 min Summer	25.149	0.0	12.4	110
240 min Summer	20.078	0.0	13.2	142
360 min Summer	14.585	0.0	14.4	202
480 min Summer	11.622	0.0	15.3	260
600 min Summer	9.738	0.0	16.1	320
720 min Summer	8.424	0.0	16.7	380
960 min Summer	6.697	0.0	17.7	496
1440 min Summer	4.839	0.0	19.2	736
2160 min Summer	3.490	0.0	20.7	1100
2880 min Summer	2.766	0.0	21.9	1468
4320 min Summer	1.989	0.0	23.6	2188
5760 min Summer	1.573	0.0	24.9	2896
7200 min Summer	1.311	0.0	25.9	3632
8640 min Summer	1.129	0.0	26.8	4336
10080 min Summer	0.994	0.0	27.6	5104
15 min Winter	138.153	0.0	6.4	23
30 min Winter	90.705	0.0	8.4	32
60 min Winter	56.713	0.0	10.5	50
120 min Winter	34.246	0.0	12.7	82
180 min Winter	25.149	0.0	13.9	114

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
240 min Winter	9.190	0.190	0.0	2.1	2.1	2.5	O K
360 min Winter	9.132	0.132	0.0	1.7	1.7	1.8	O K
480 min Winter	9.100	0.100	0.0	1.4	1.4	1.3	O K
600 min Winter	9.080	0.080	0.0	1.2	1.2	1.1	O K
720 min Winter	9.069	0.069	0.0	1.1	1.1	0.9	O K
960 min Winter	9.059	0.059	0.0	0.9	0.9	0.8	O K
1440 min Winter	9.048	0.048	0.0	0.6	0.6	0.6	O K
2160 min Winter	9.040	0.040	0.0	0.5	0.5	0.5	O K
2880 min Winter	9.034	0.034	0.0	0.4	0.4	0.4	O K
4320 min Winter	9.028	0.028	0.0	0.3	0.3	0.4	O K
5760 min Winter	9.025	0.025	0.0	0.2	0.2	0.3	O K
7200 min Winter	9.023	0.023	0.0	0.2	0.2	0.3	O K
8640 min Winter	9.021	0.021	0.0	0.1	0.1	0.3	O K
10080 min Winter	9.020	0.020	0.0	0.1	0.1	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	20.078	0.0	14.8	146
360 min Winter	14.585	0.0	16.2	206
480 min Winter	11.622	0.0	17.2	264
600 min Winter	9.738	0.0	18.0	320
720 min Winter	8.424	0.0	18.7	378
960 min Winter	6.697	0.0	19.8	500
1440 min Winter	4.839	0.0	21.5	740
2160 min Winter	3.490	0.0	23.2	1100
2880 min Winter	2.766	0.0	24.5	1428
4320 min Winter	1.989	0.0	26.5	2140
5760 min Winter	1.573	0.0	27.9	2864
7200 min Winter	1.311	0.0	29.1	3552
8640 min Winter	1.129	0.0	30.0	4400
10080 min Winter	0.994	0.0	30.9	5136

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.022

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 5	0.008	5 10	0.007	10 15	0.007

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

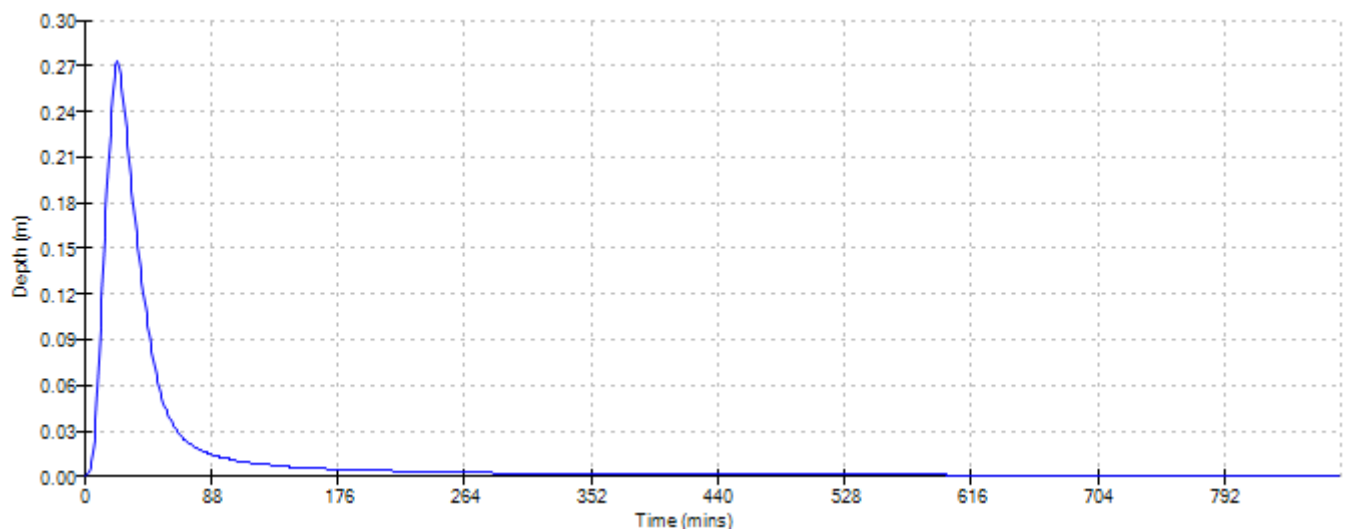
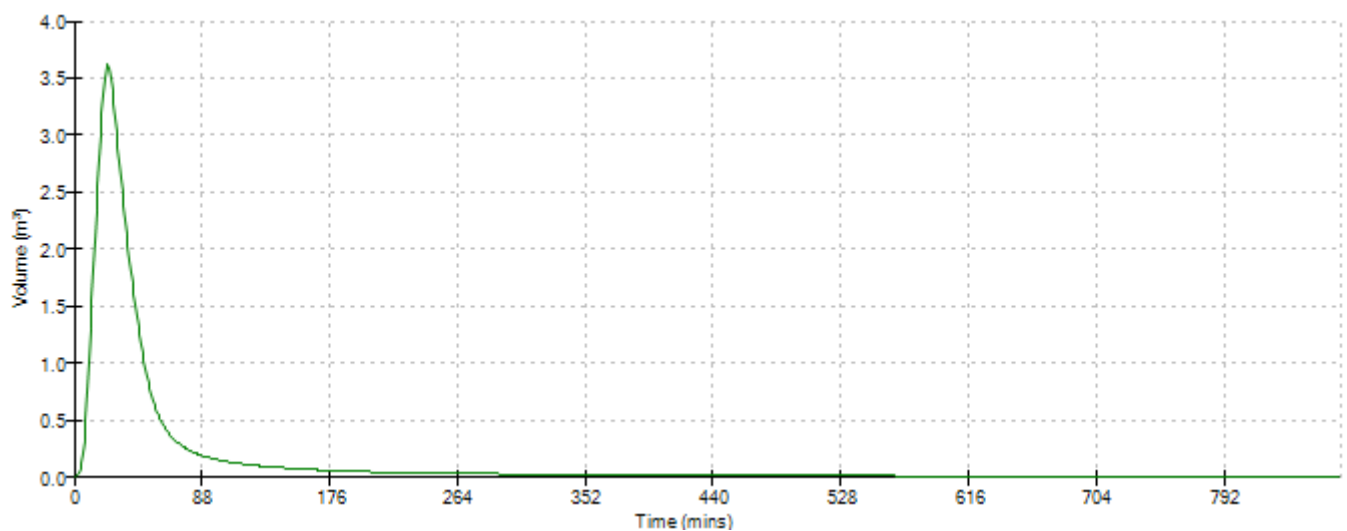
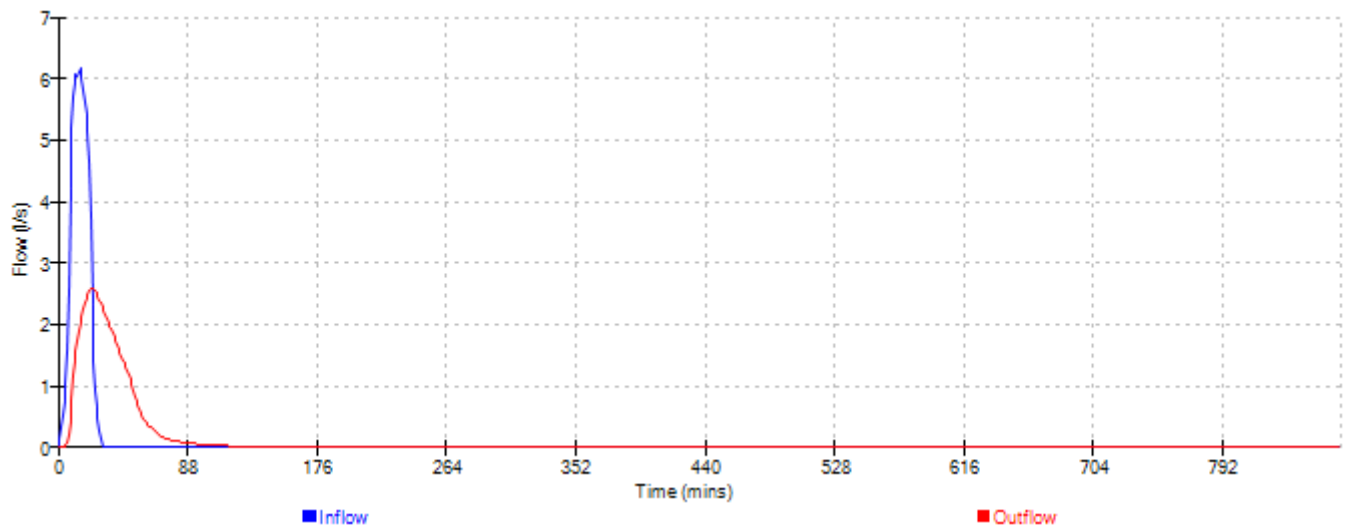
Invert Level (m) 9.000 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	14.0	14.0	0.400	14.0	20.0	0.401	0.0	20.0

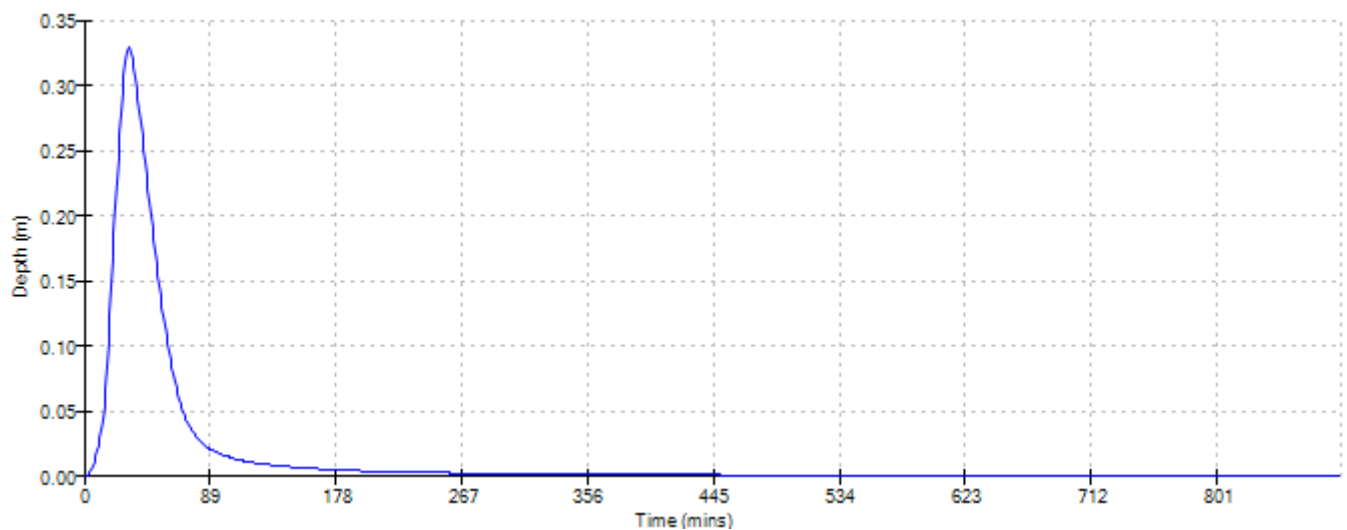
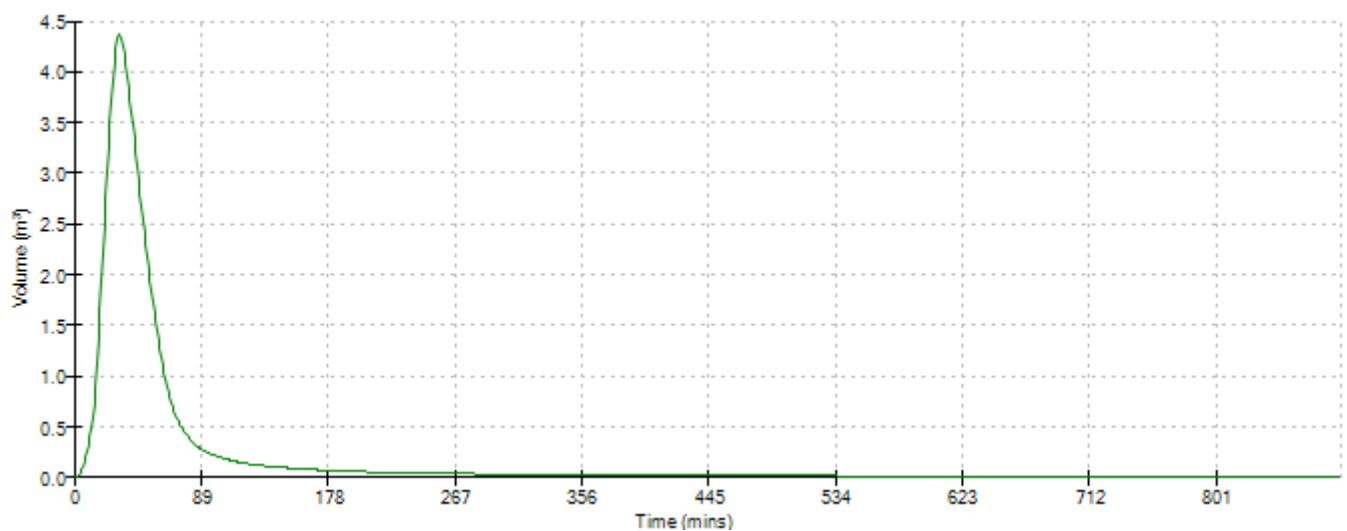
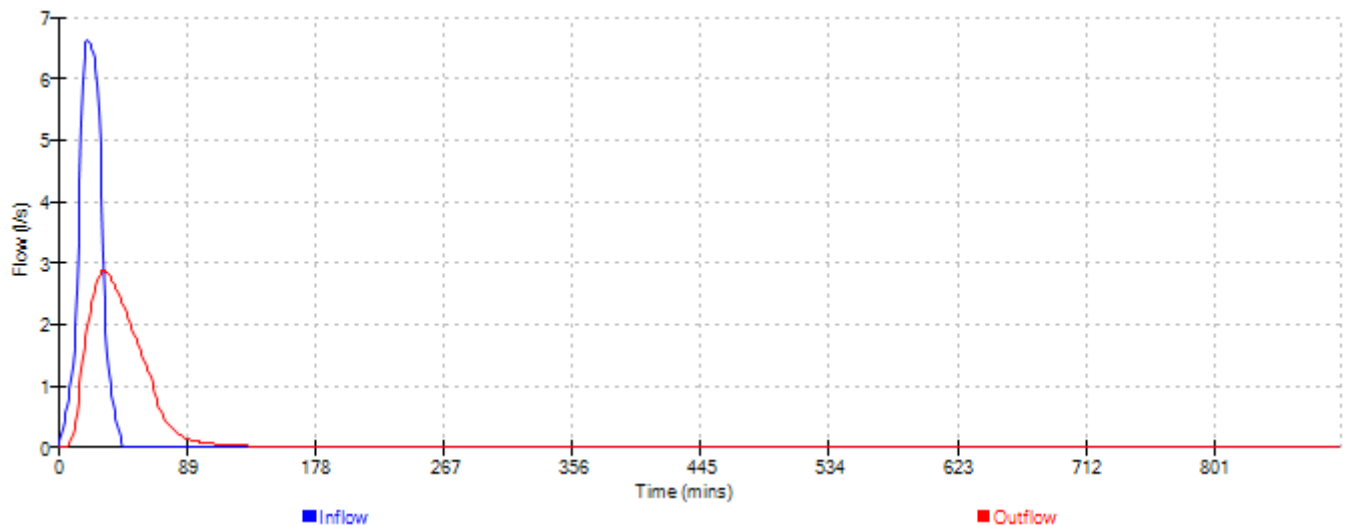
Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 9.000

Event: 15 min Summer

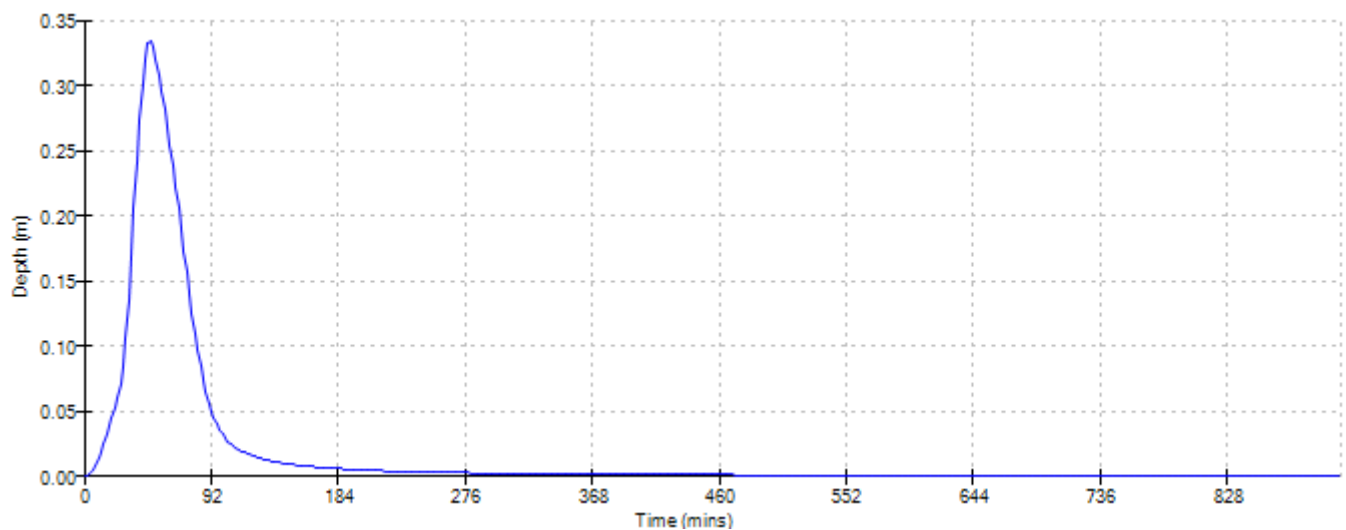
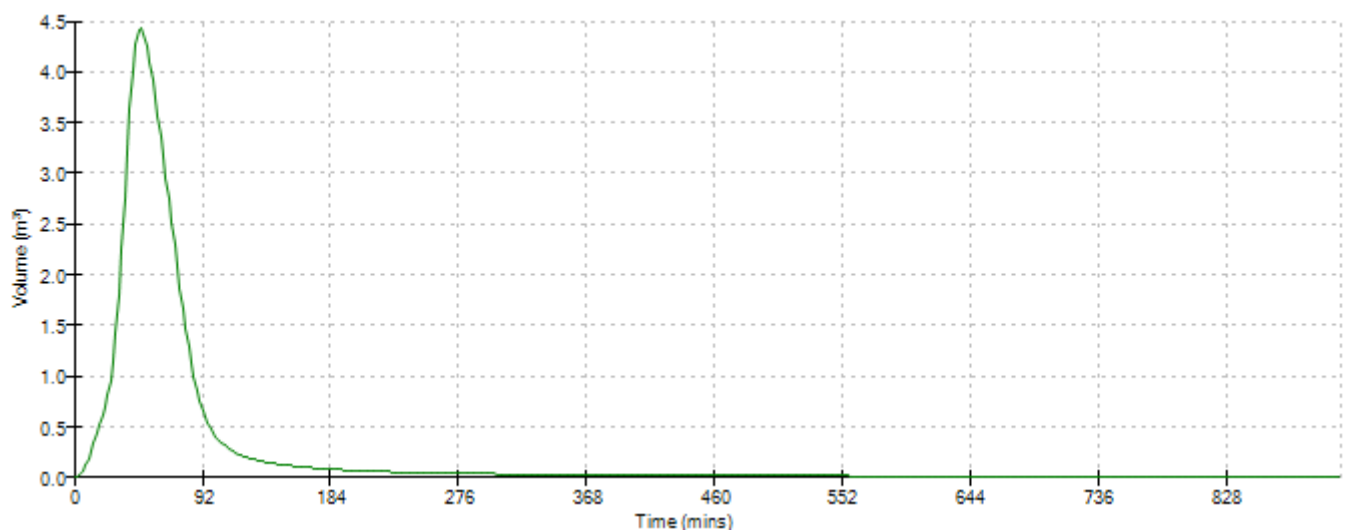
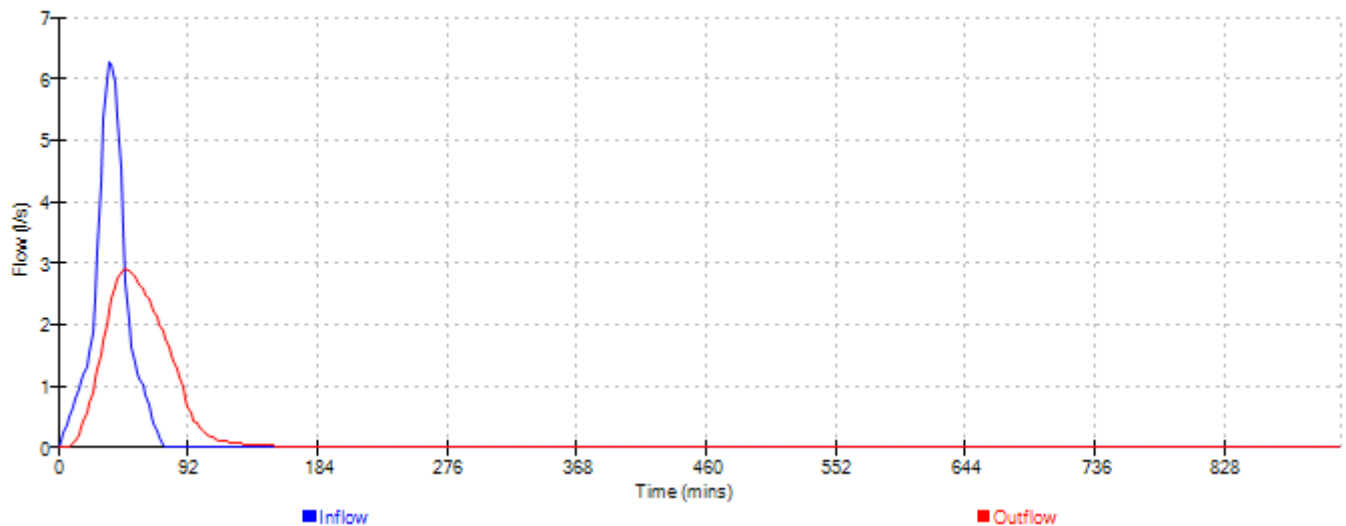


Event: 30 min Summer

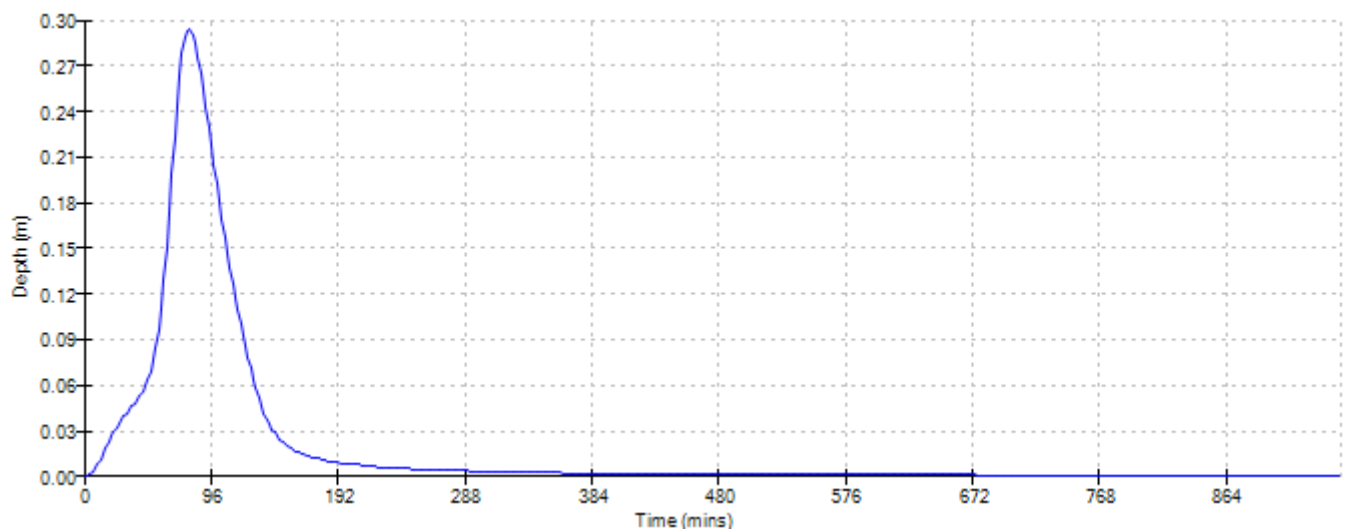
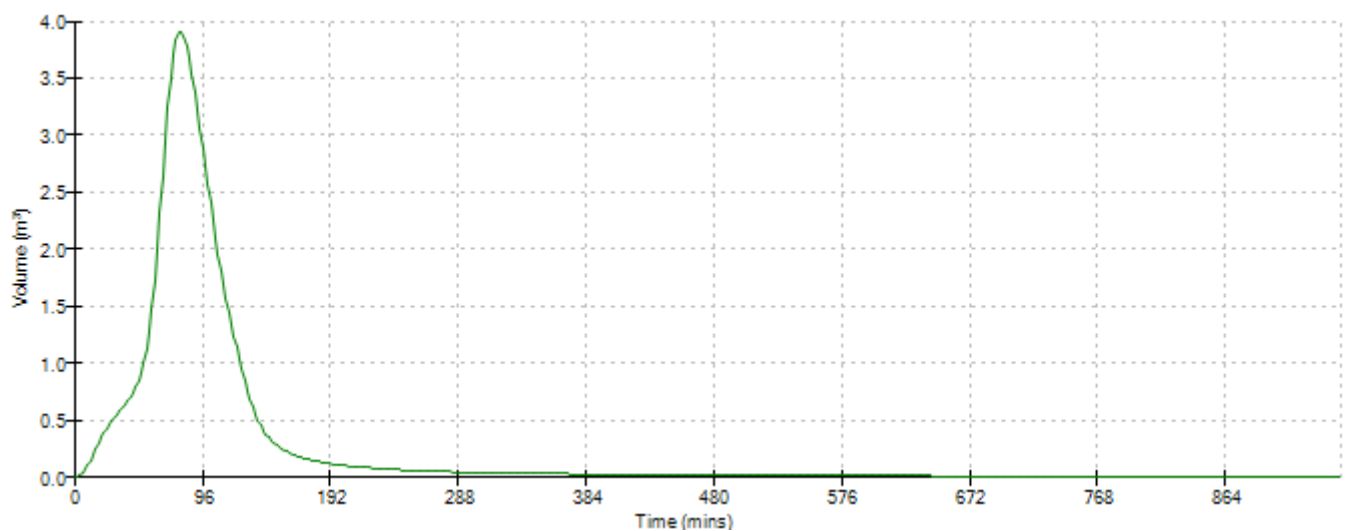
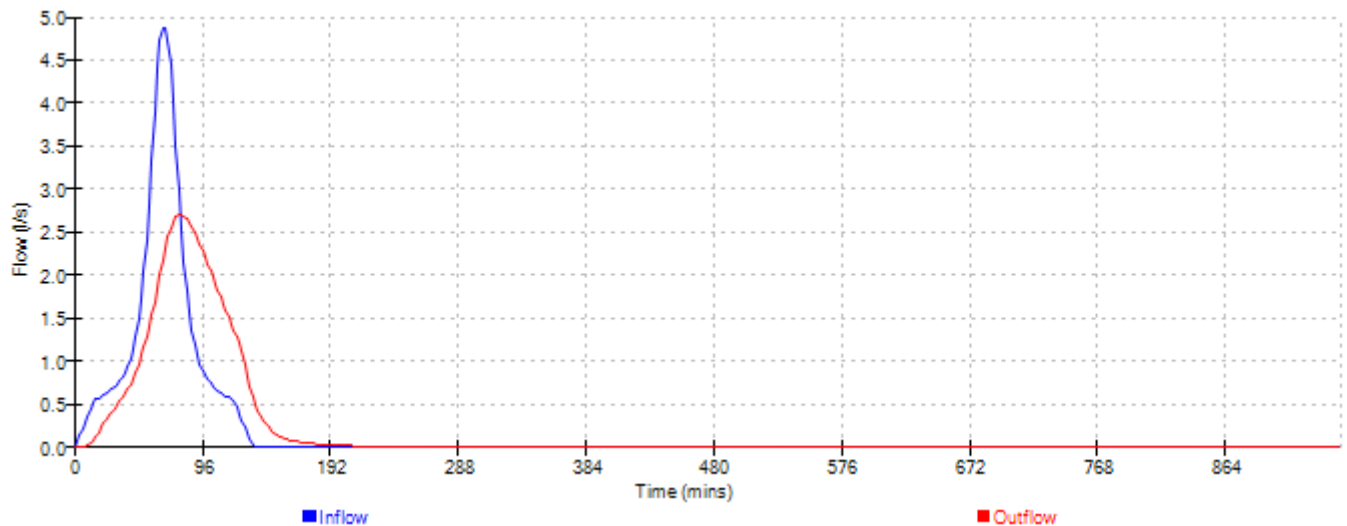


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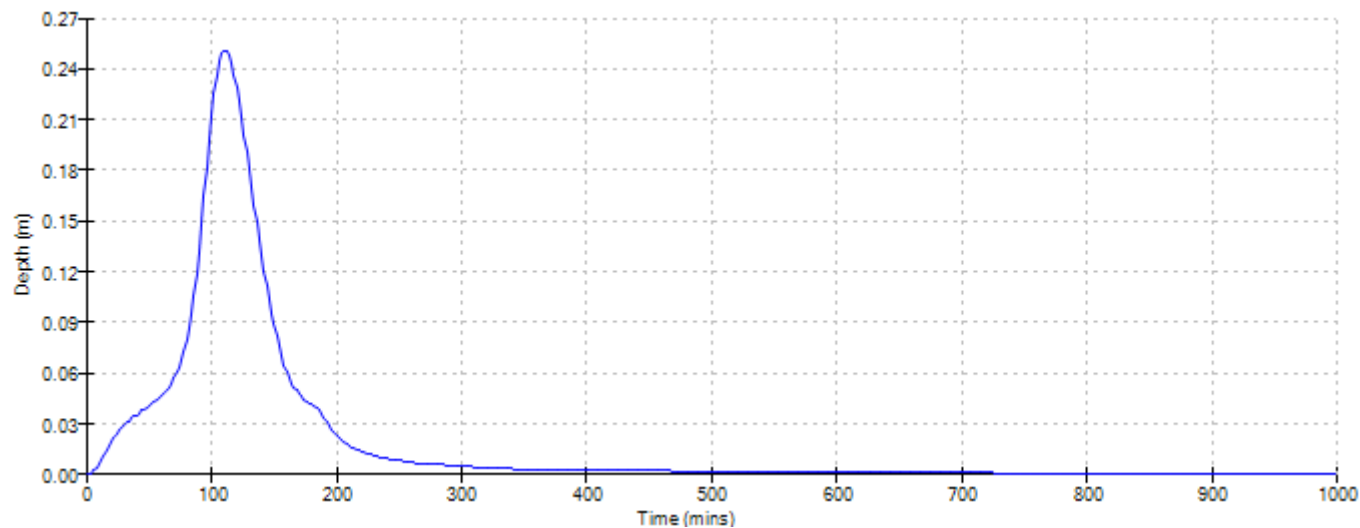
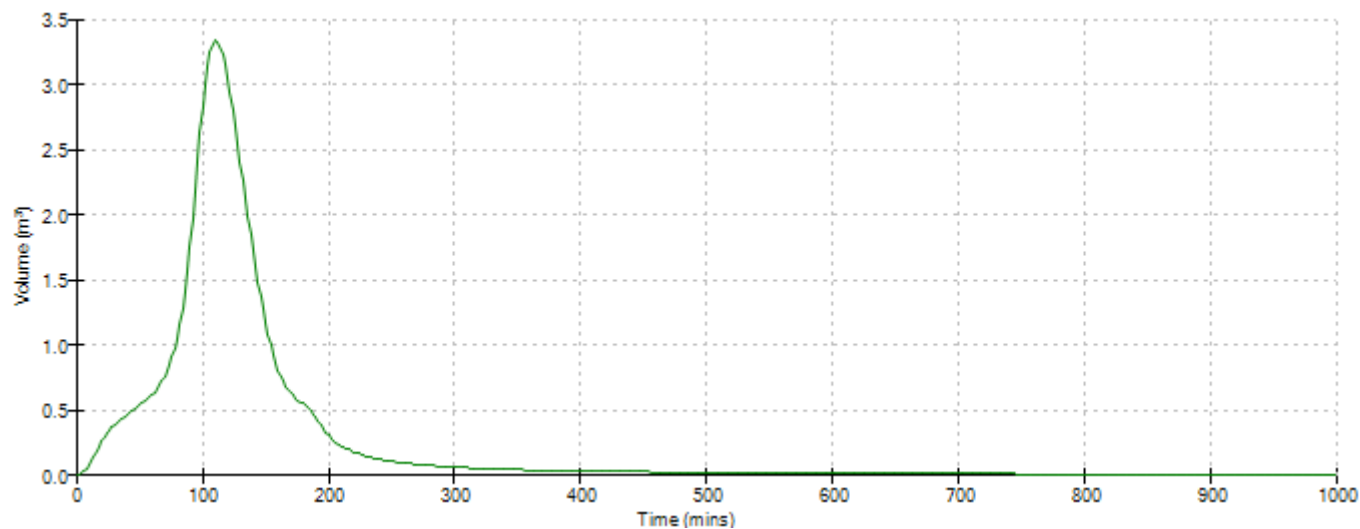
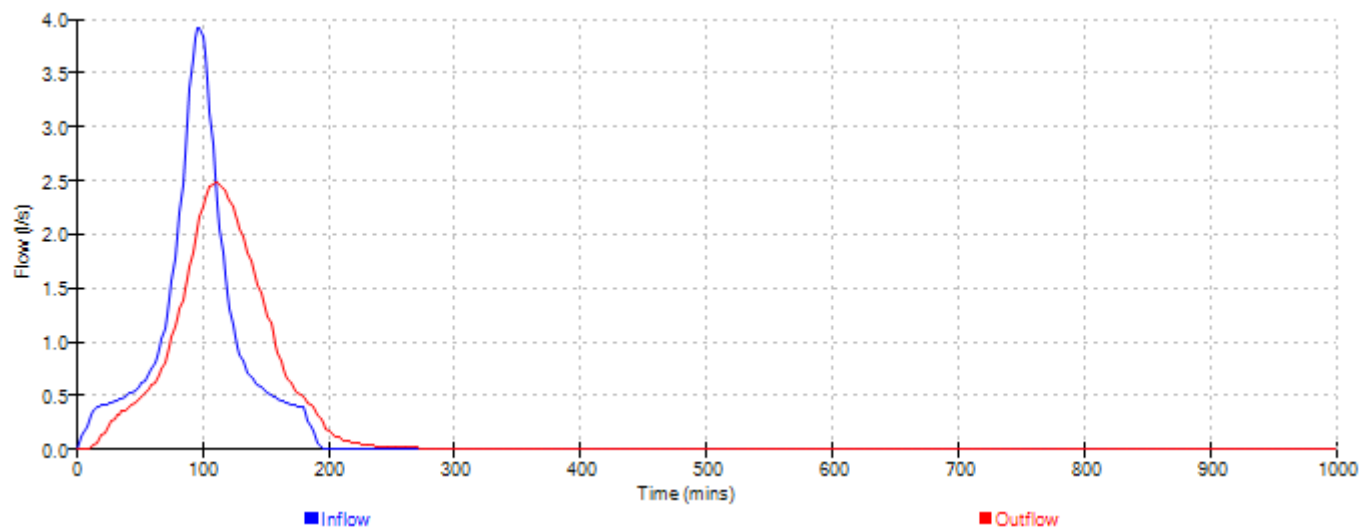
Event: 60 min Summer



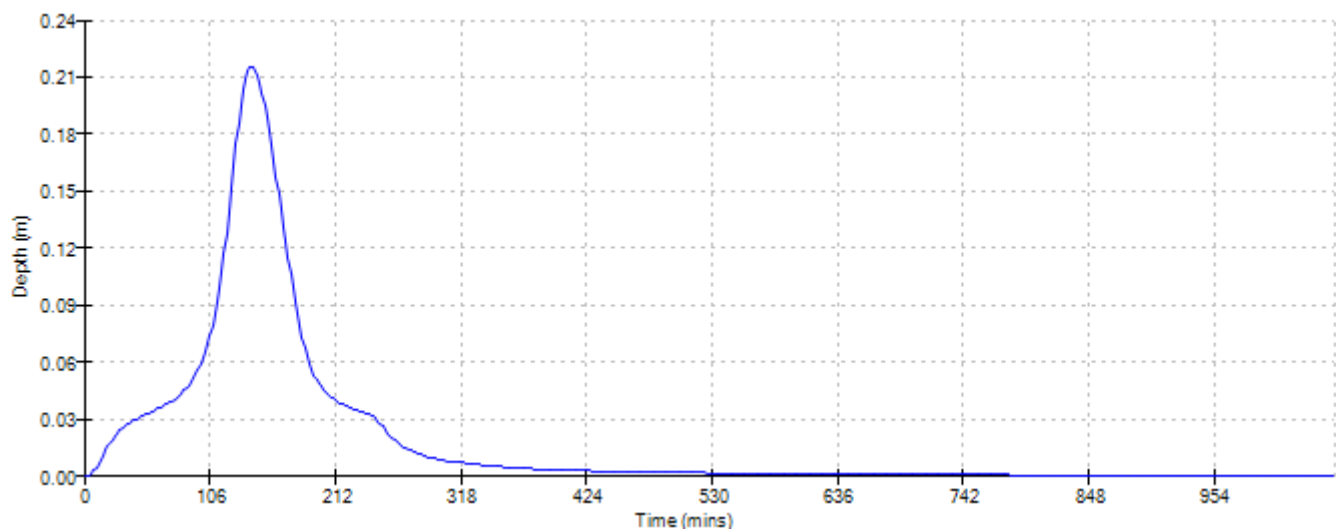
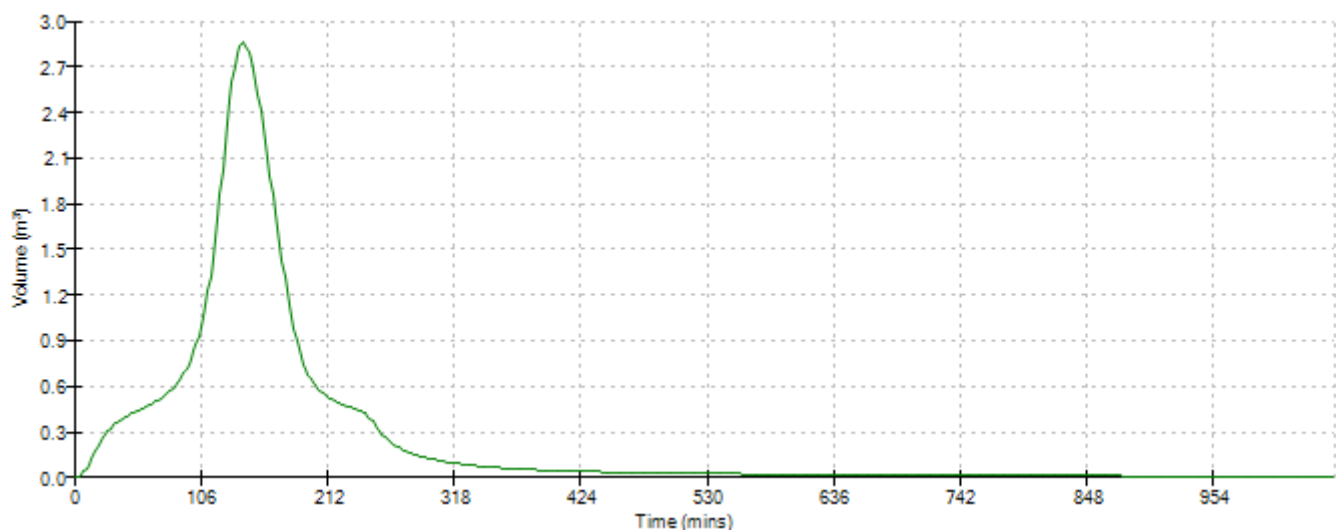
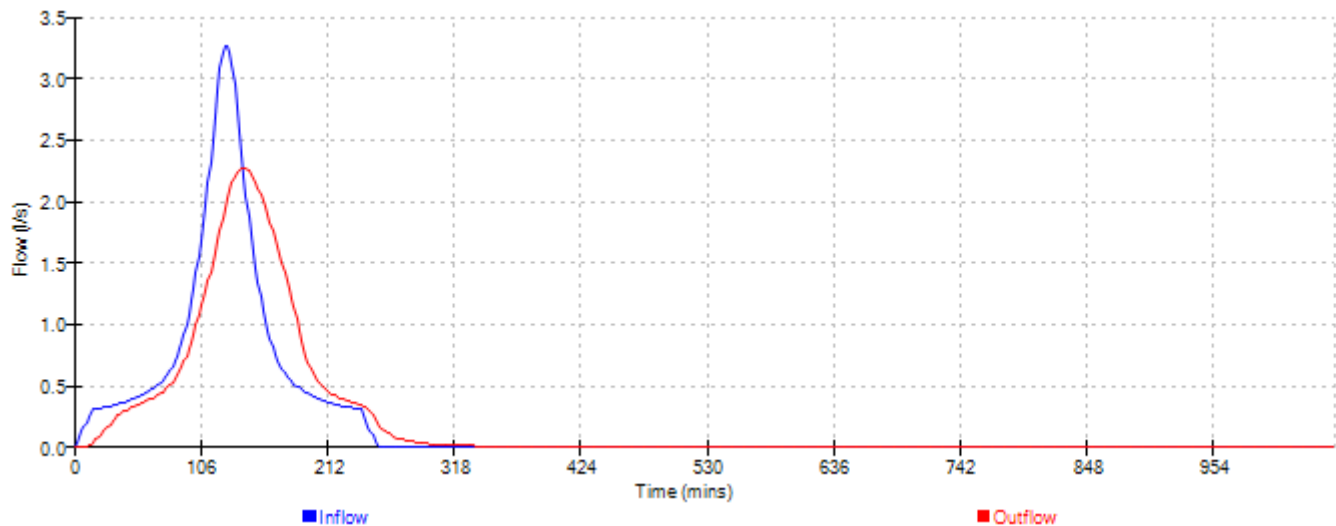
Event: 120 min Summer



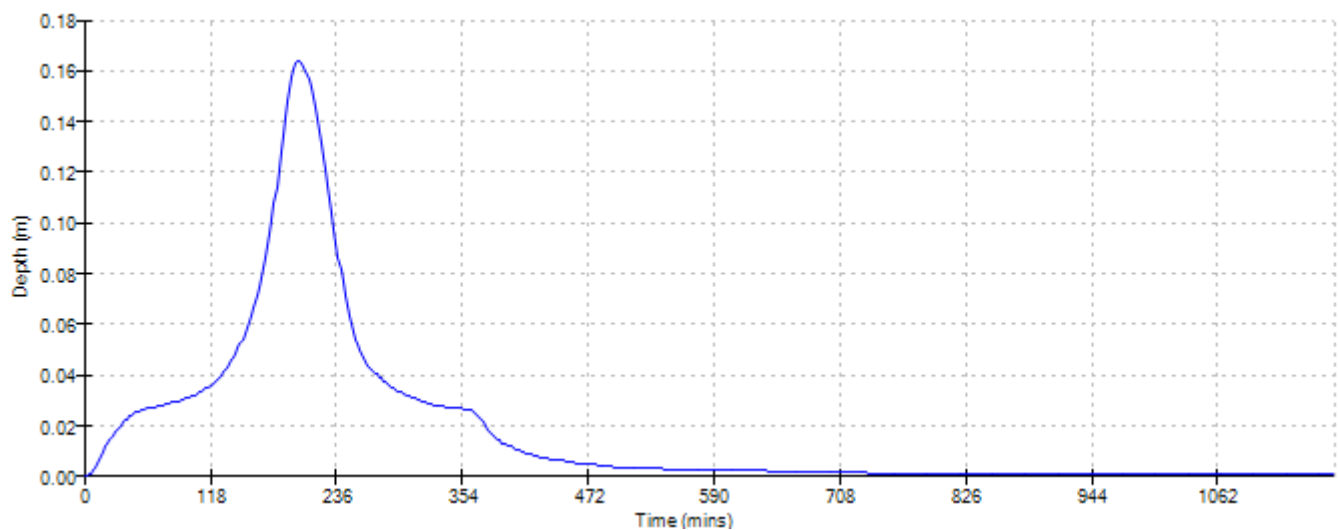
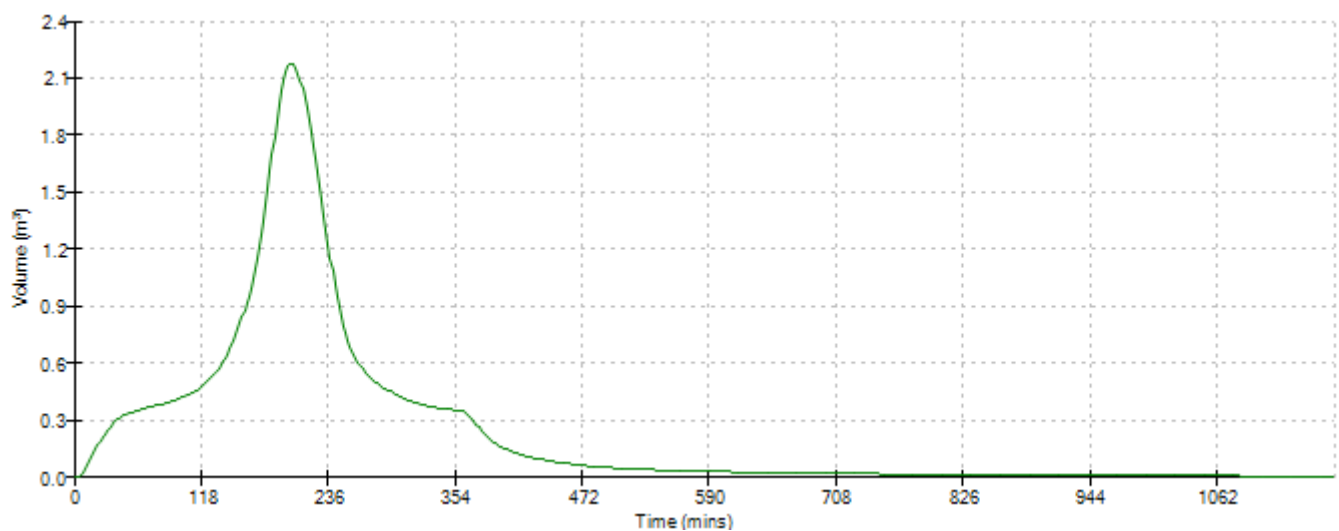
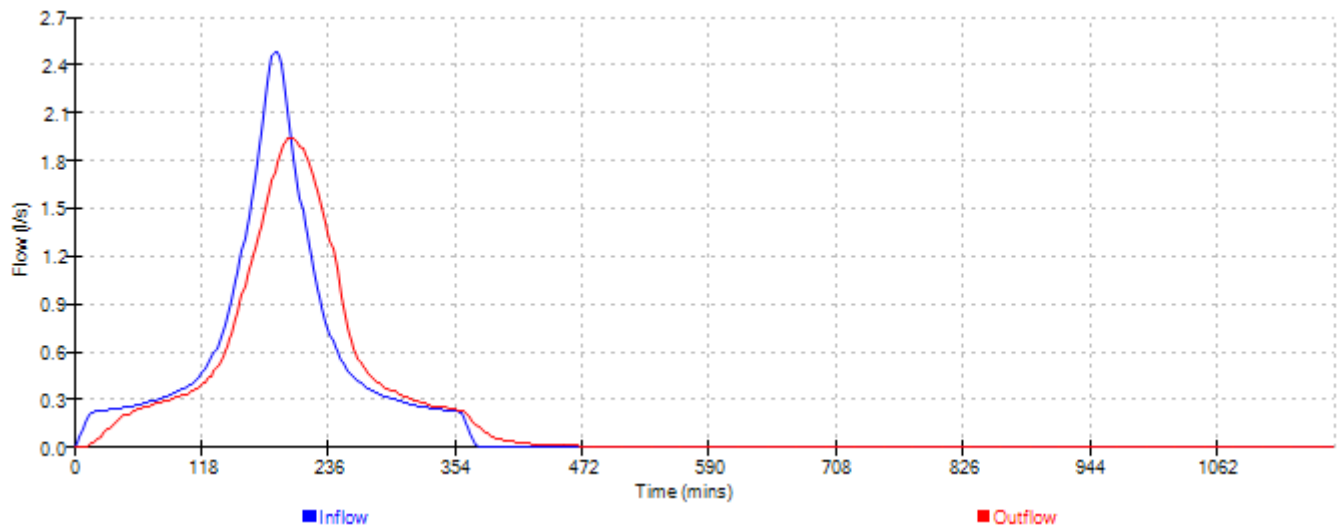
Event: 180 min Summer



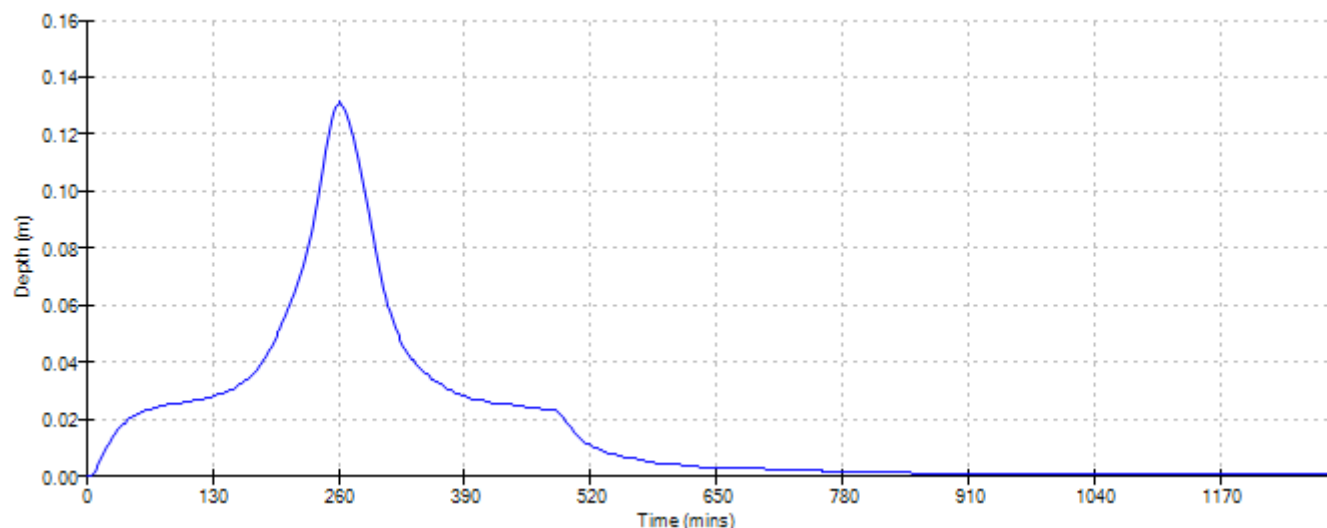
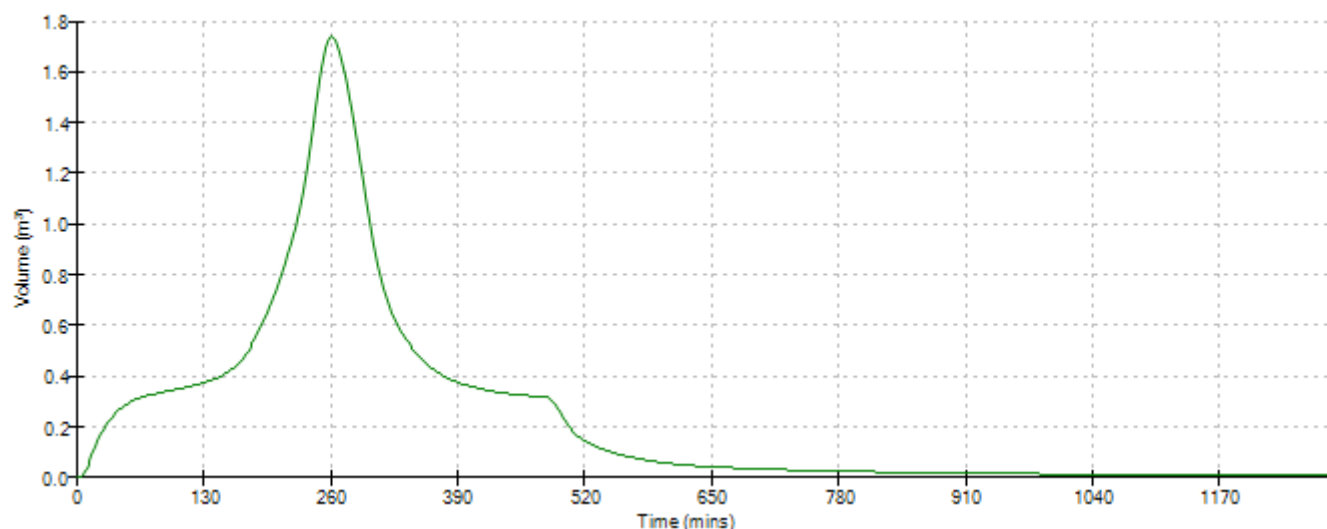
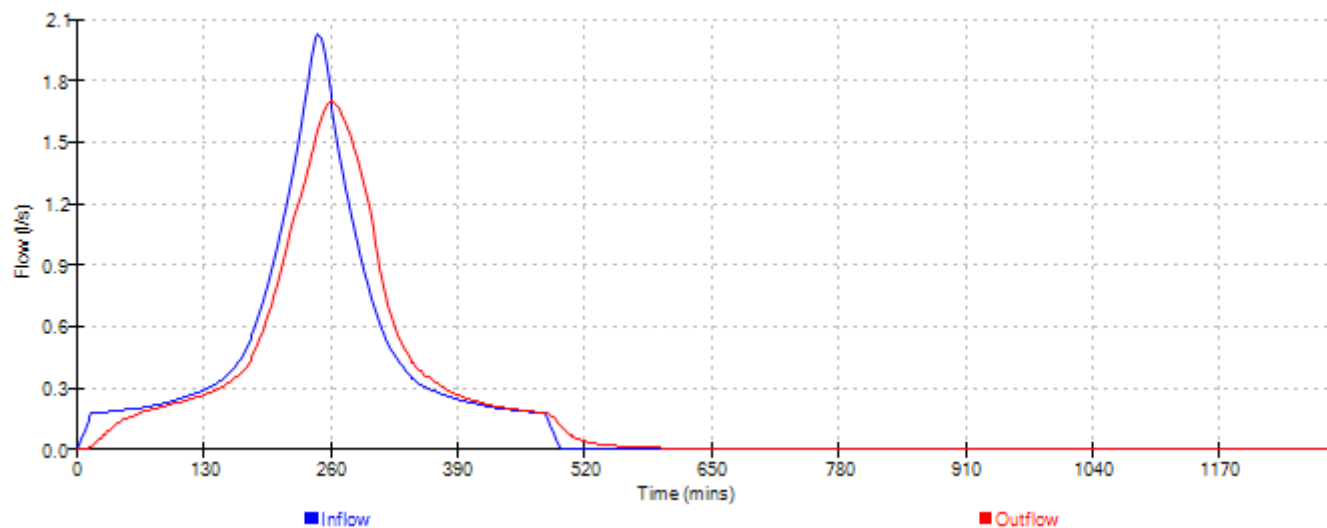
Event: 240 min Summer



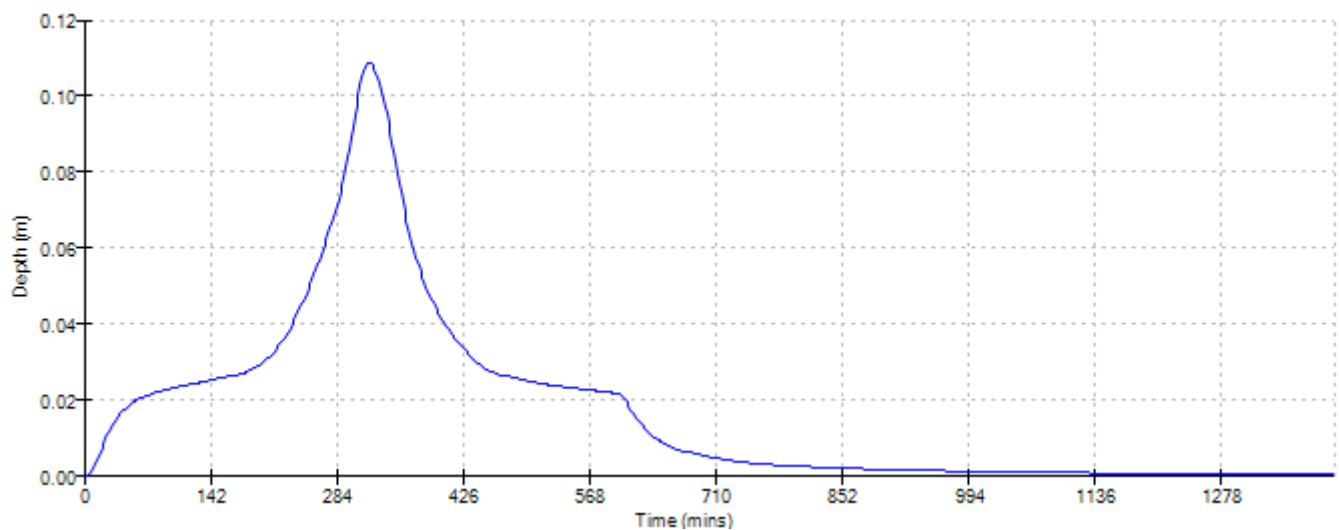
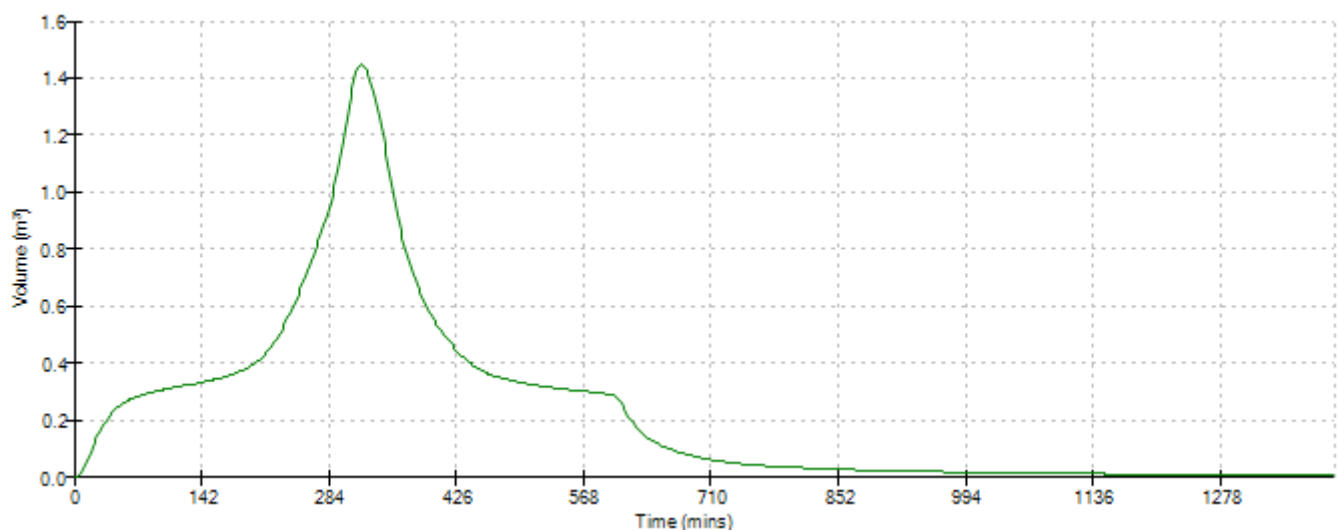
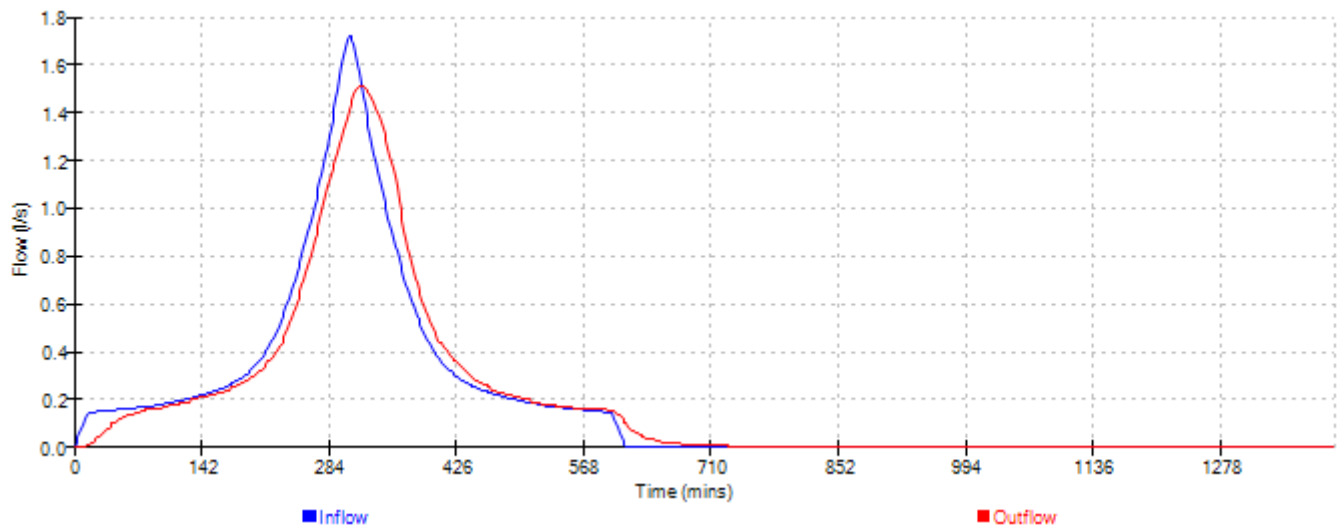
Event: 360 min Summer



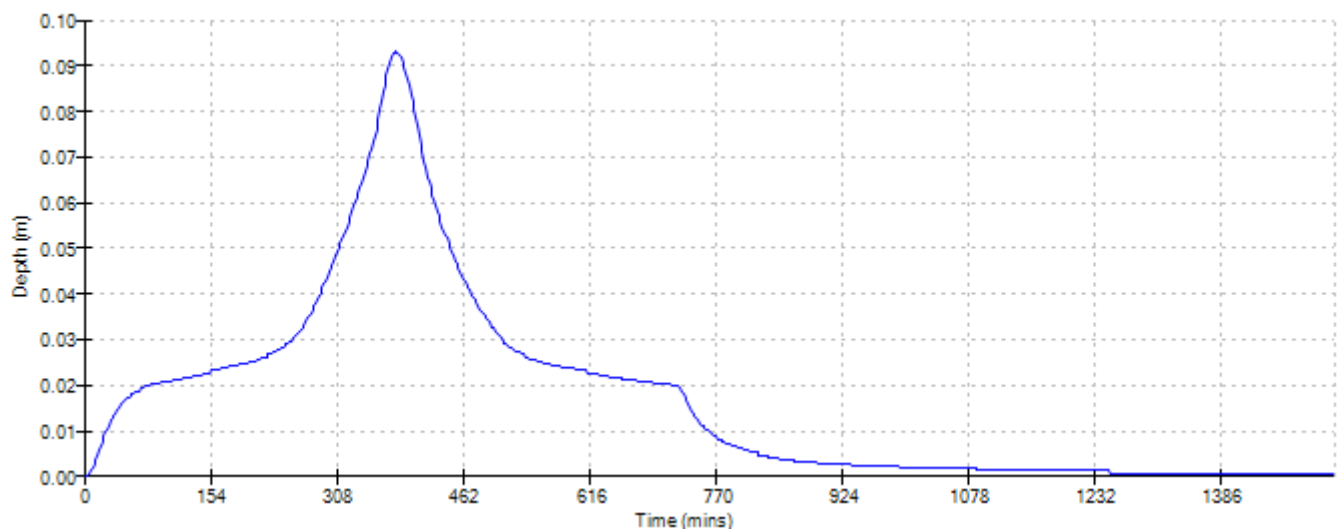
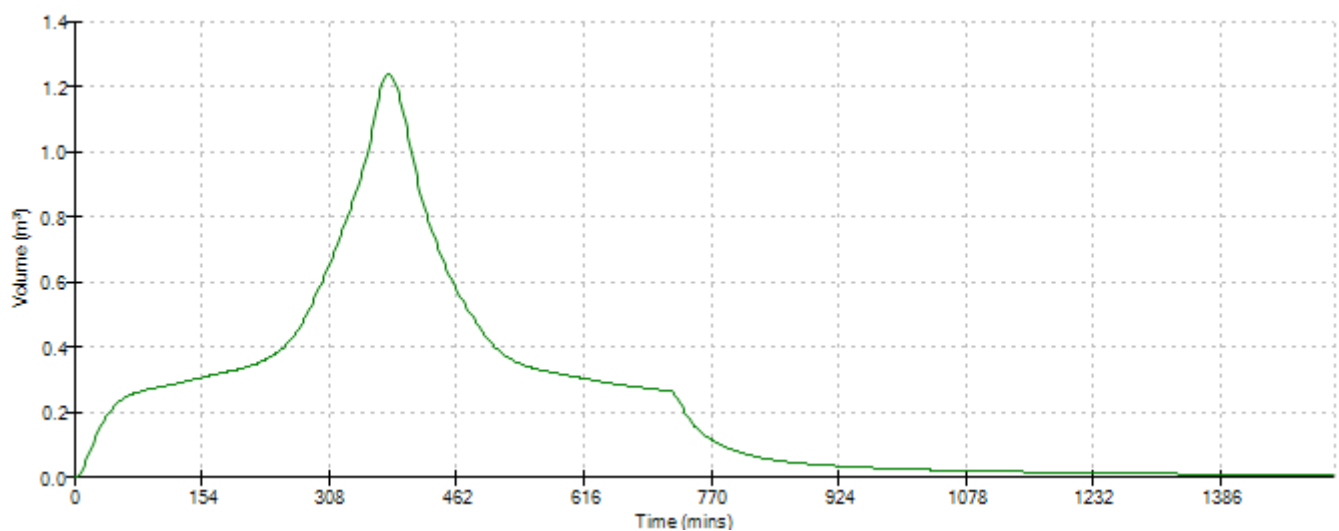
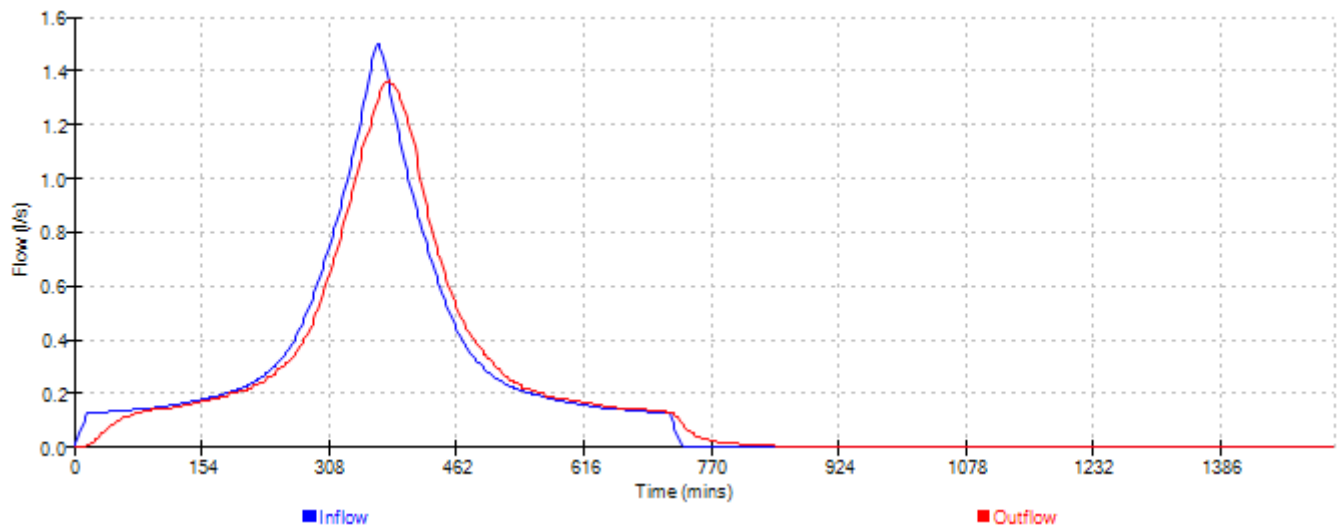
Event: 480 min Summer



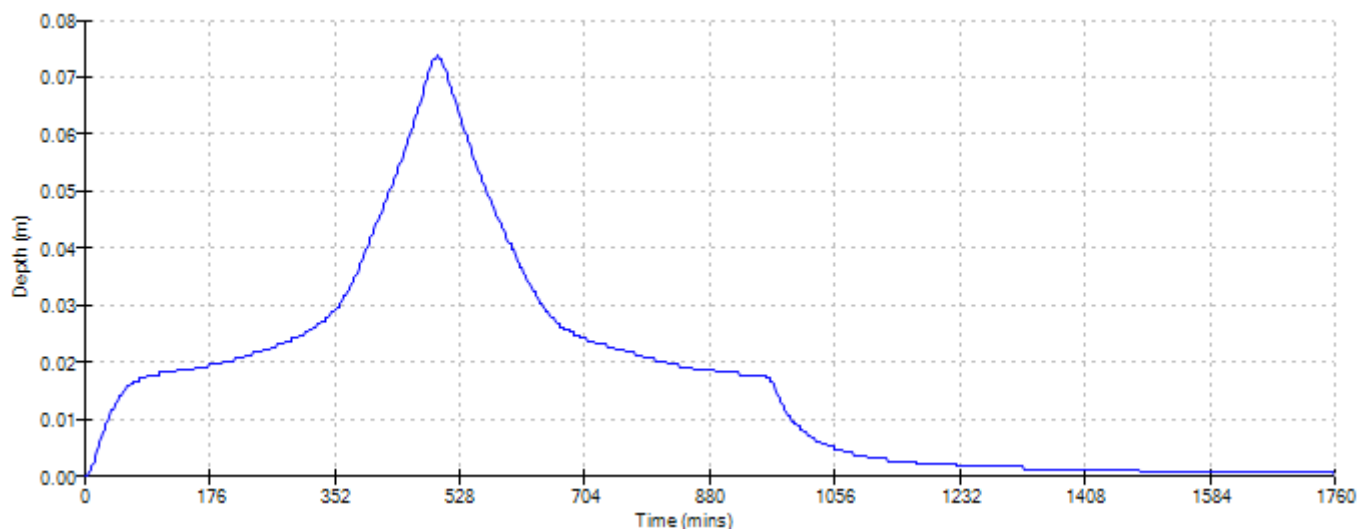
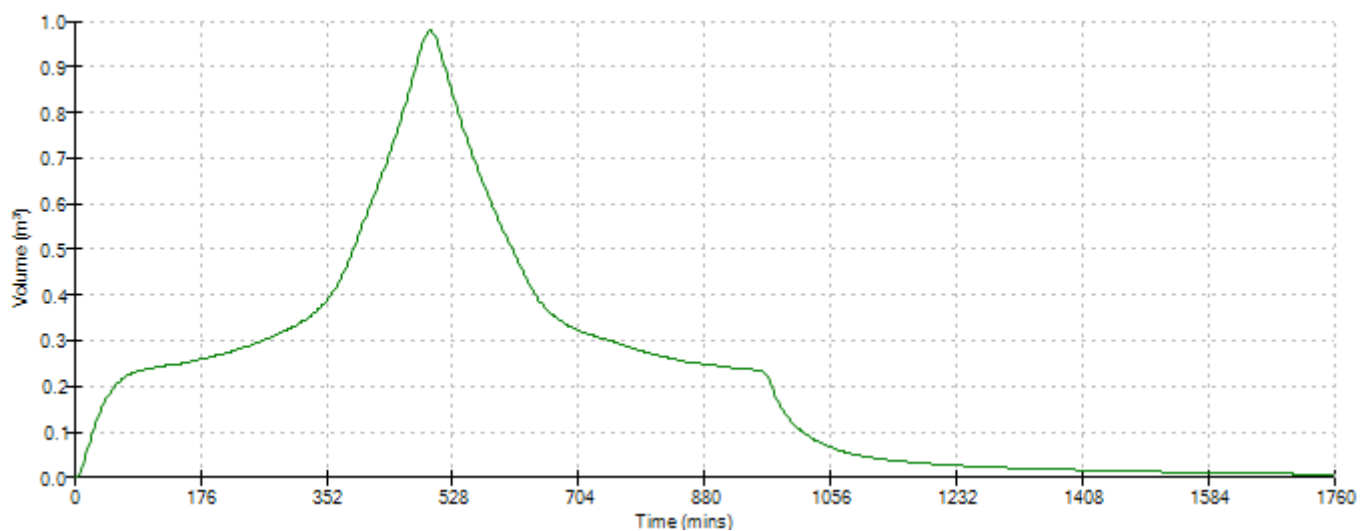
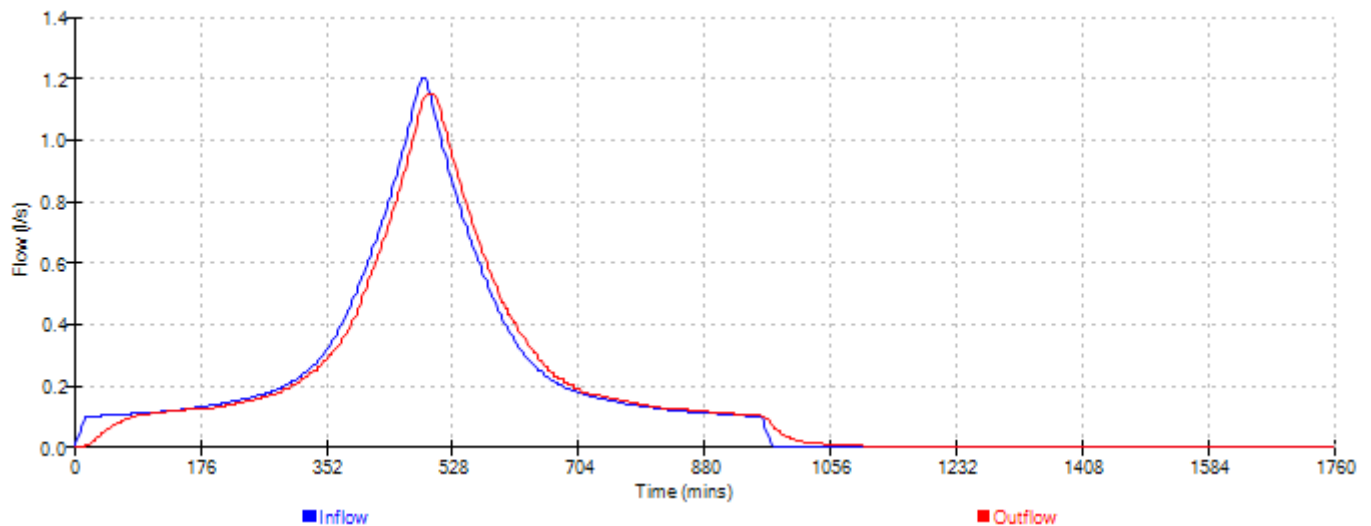
Event: 600 min Summer



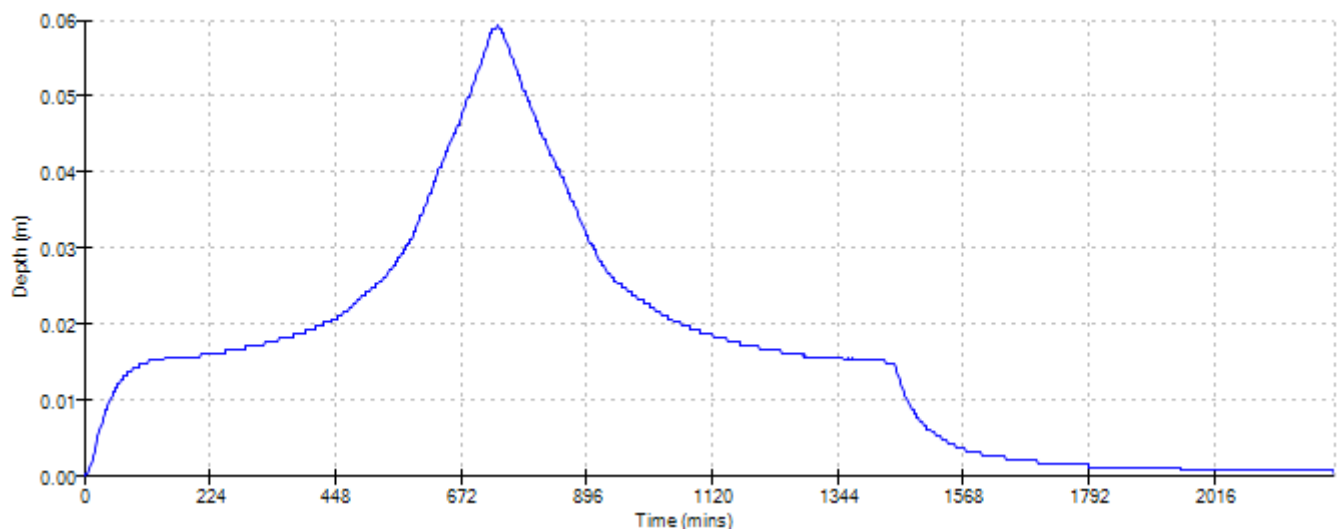
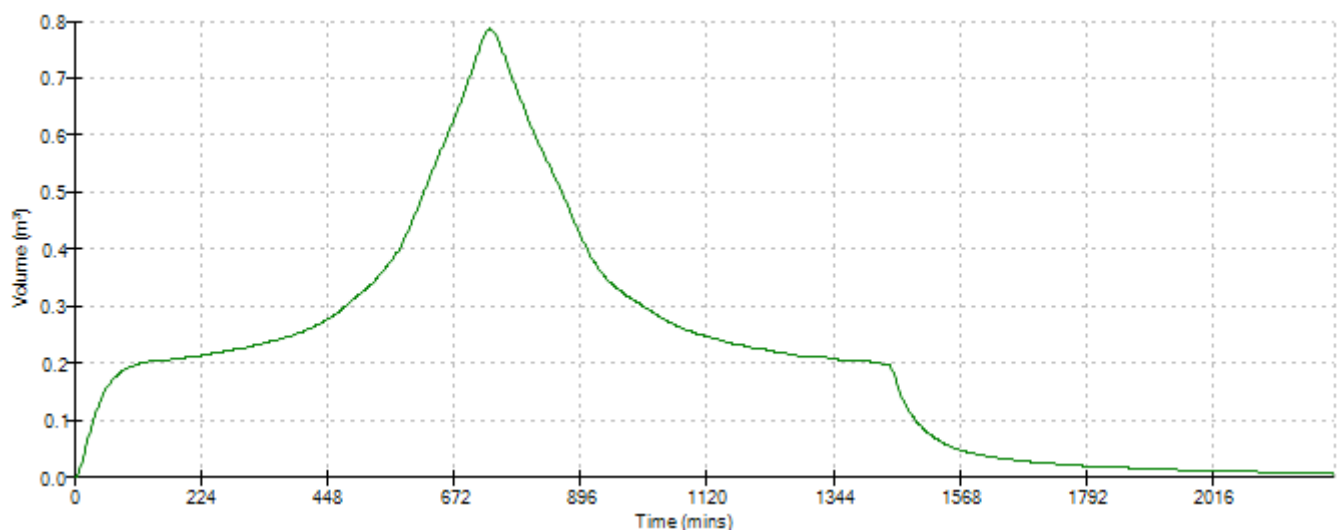
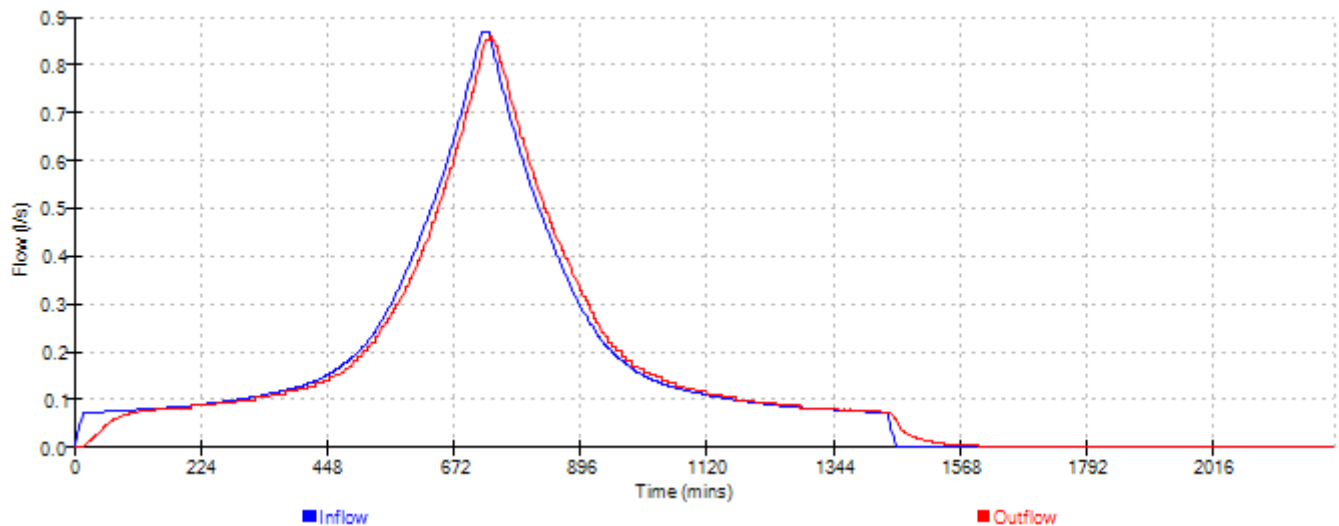
Event: 720 min Summer



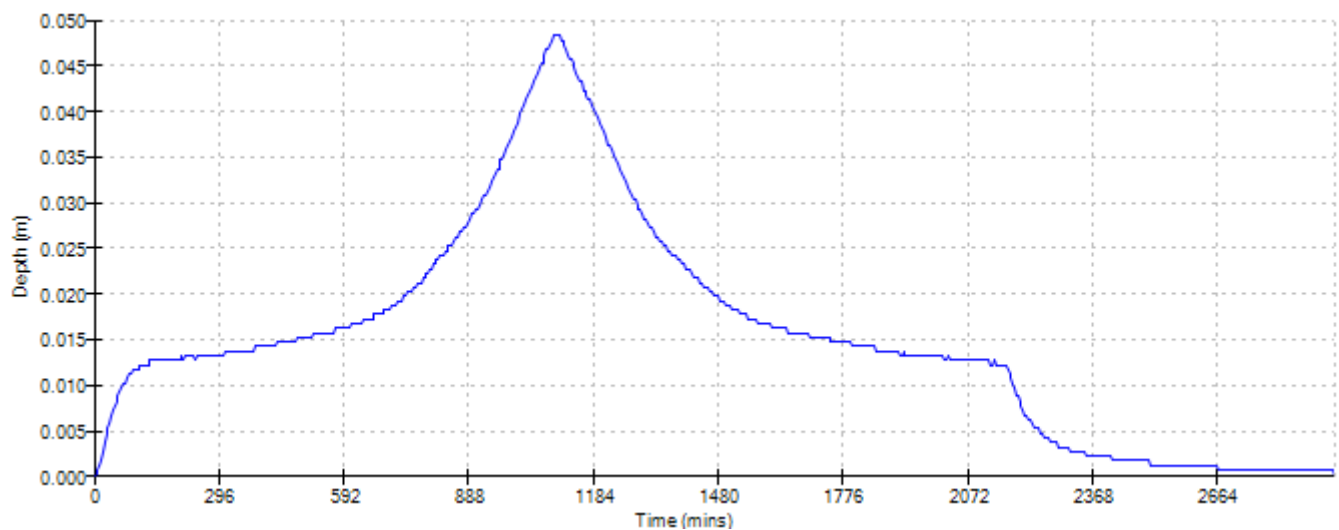
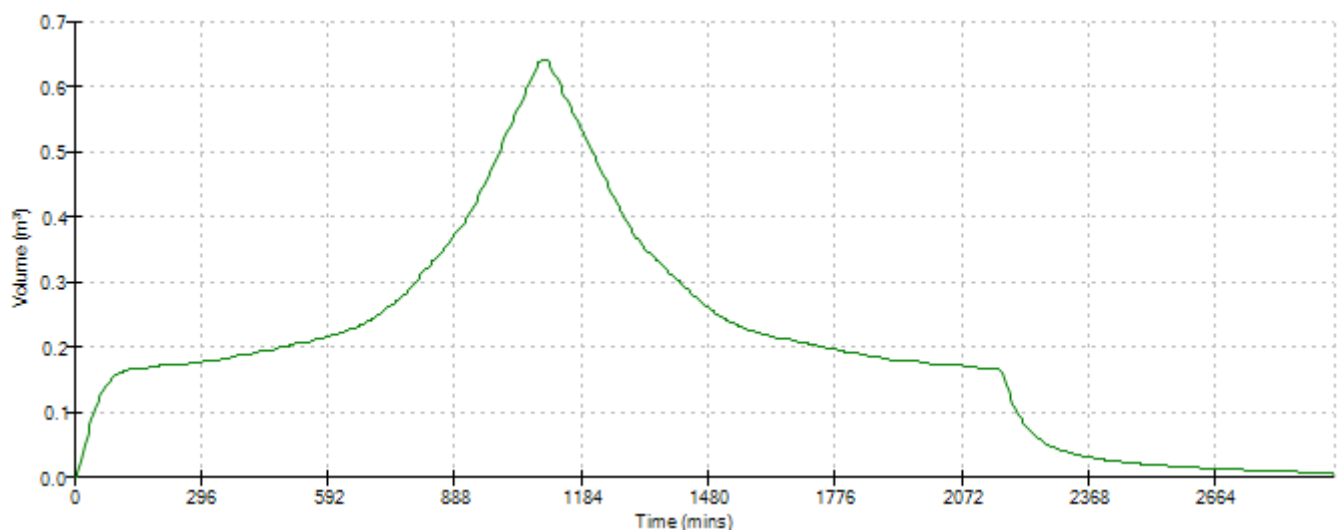
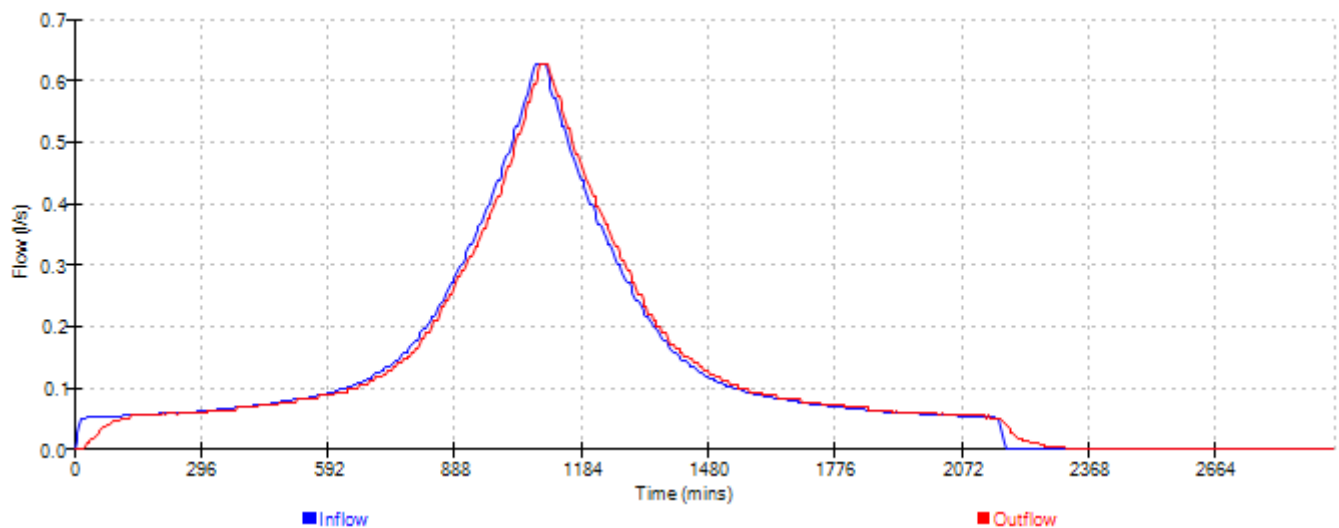
Event: 960 min Summer



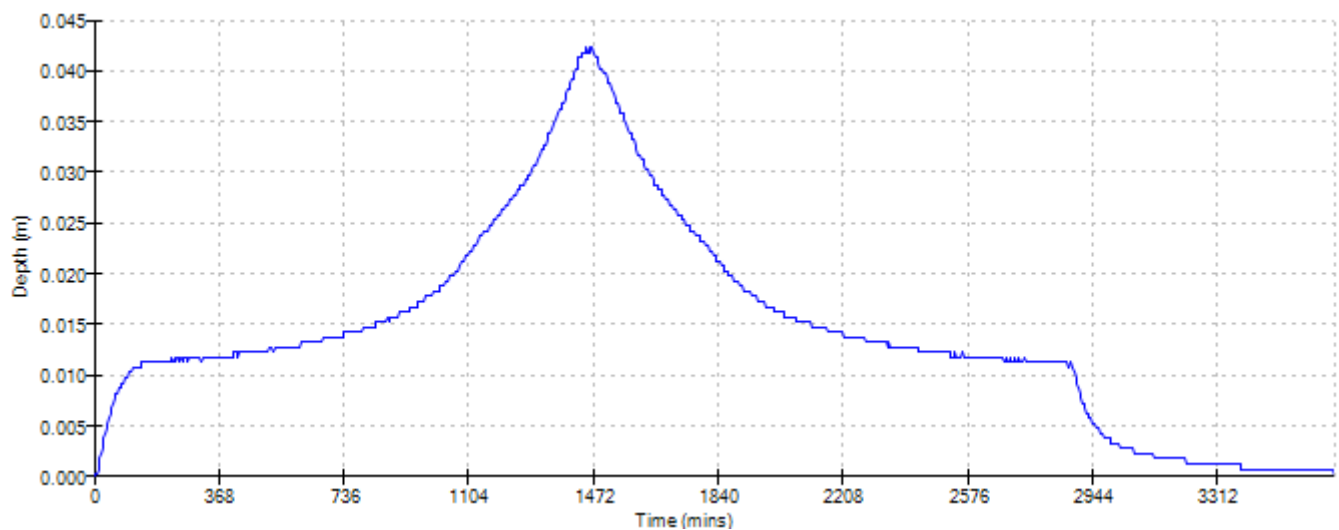
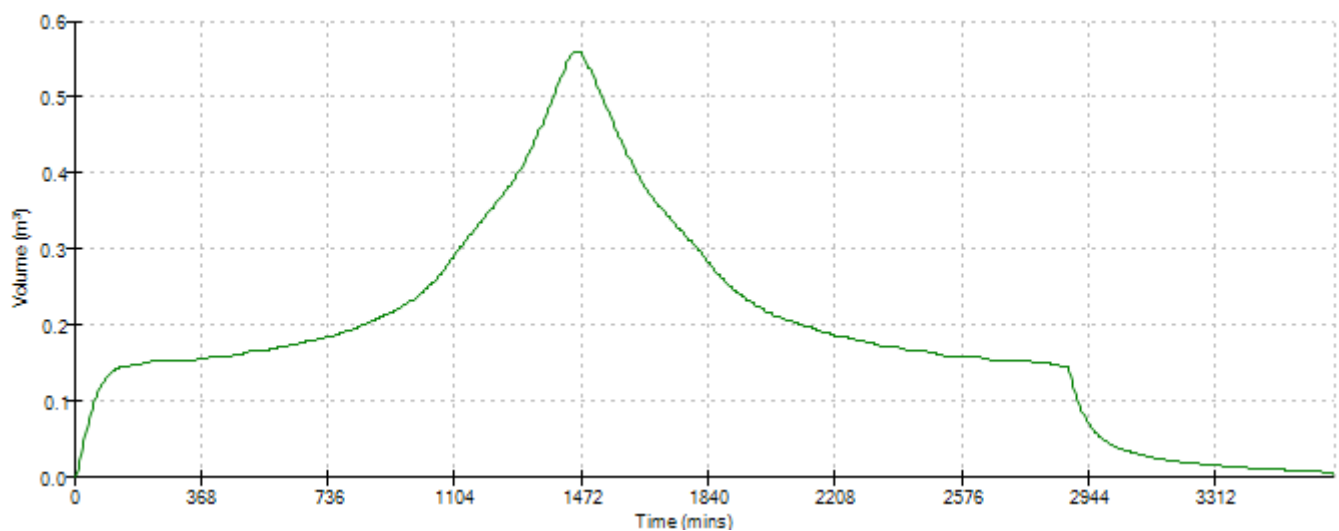
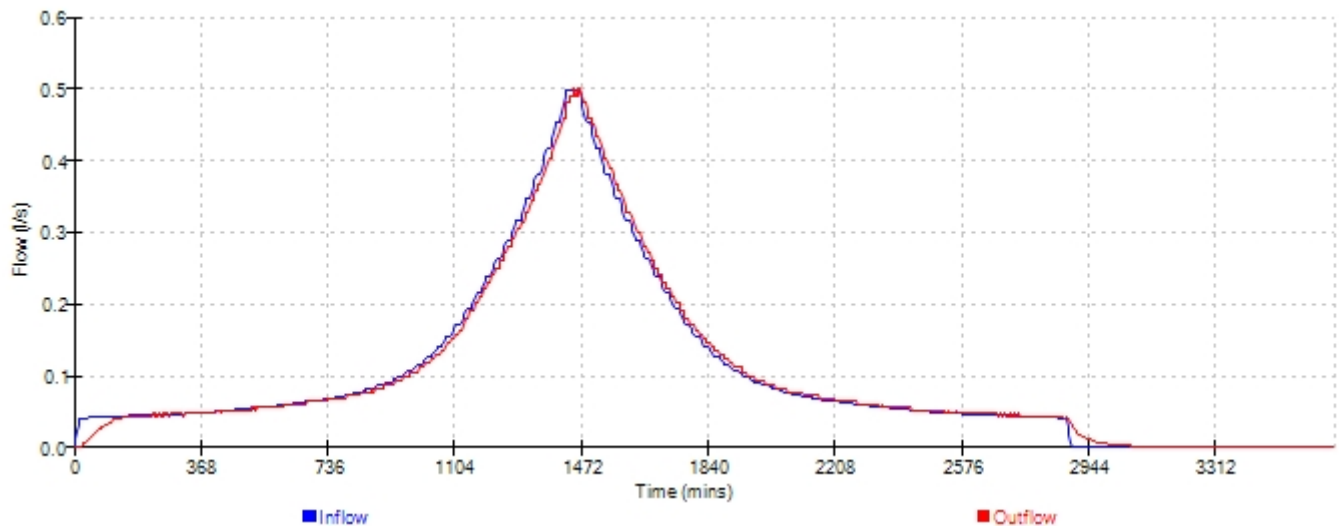
Event: 1440 min Summer



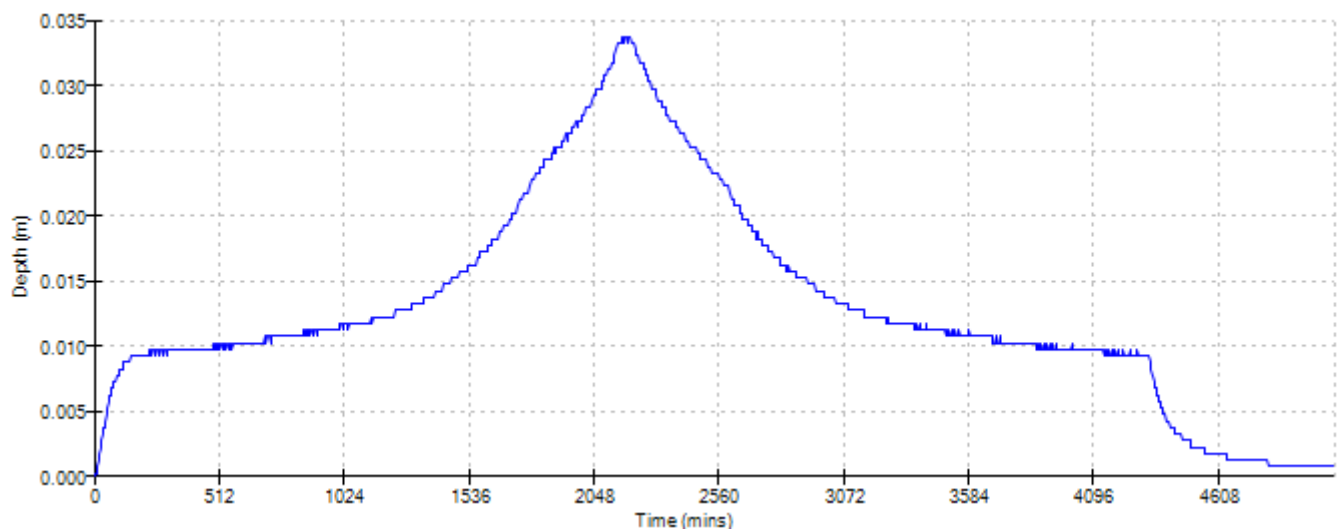
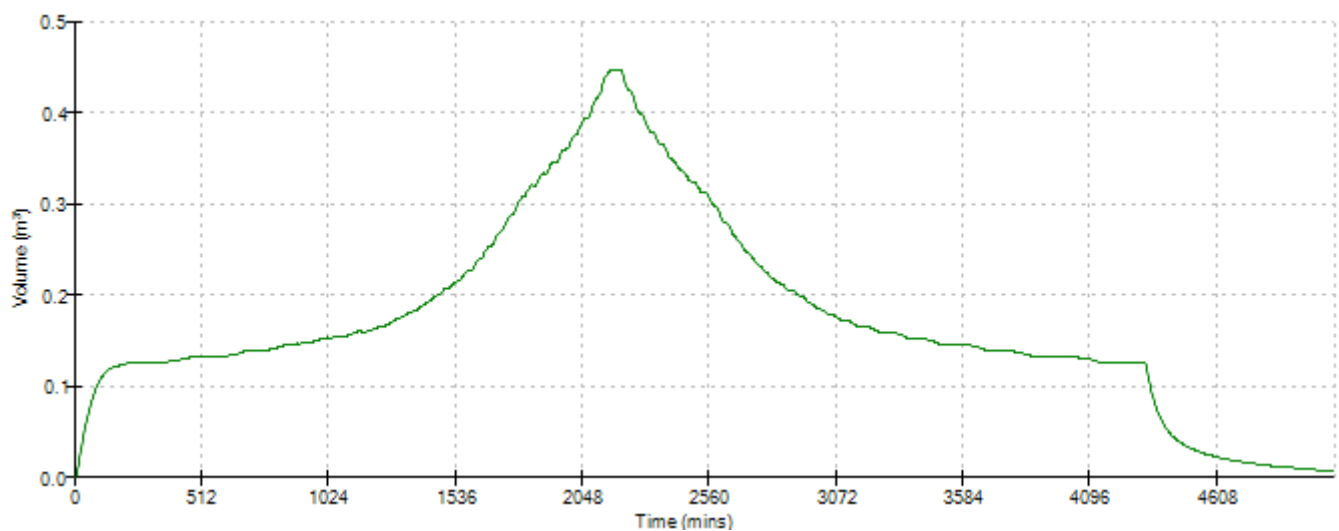
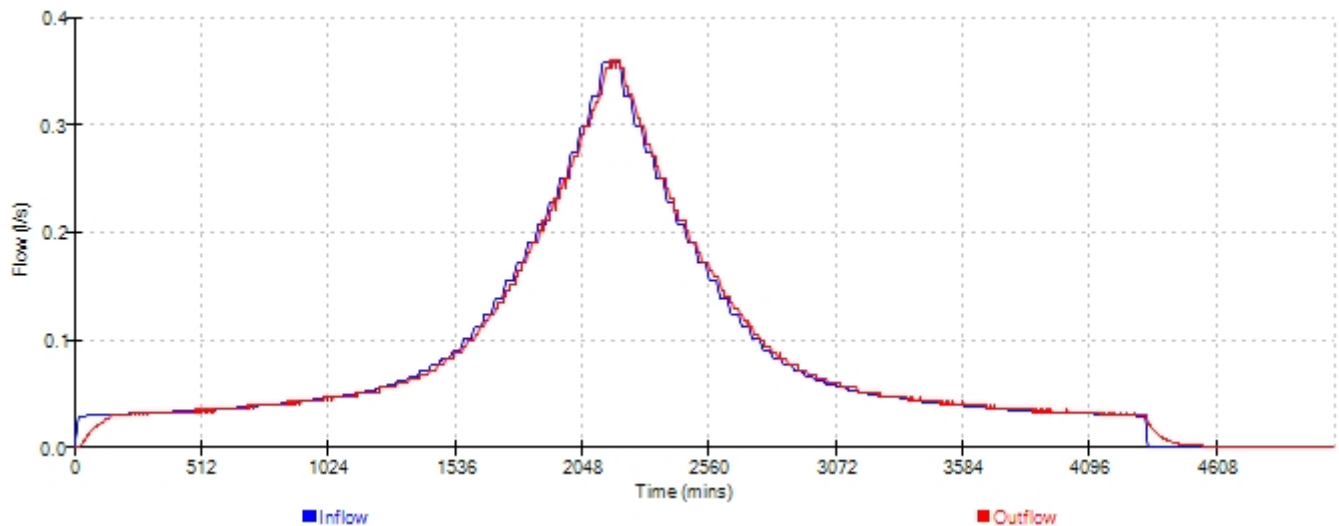
Event: 2160 min Summer



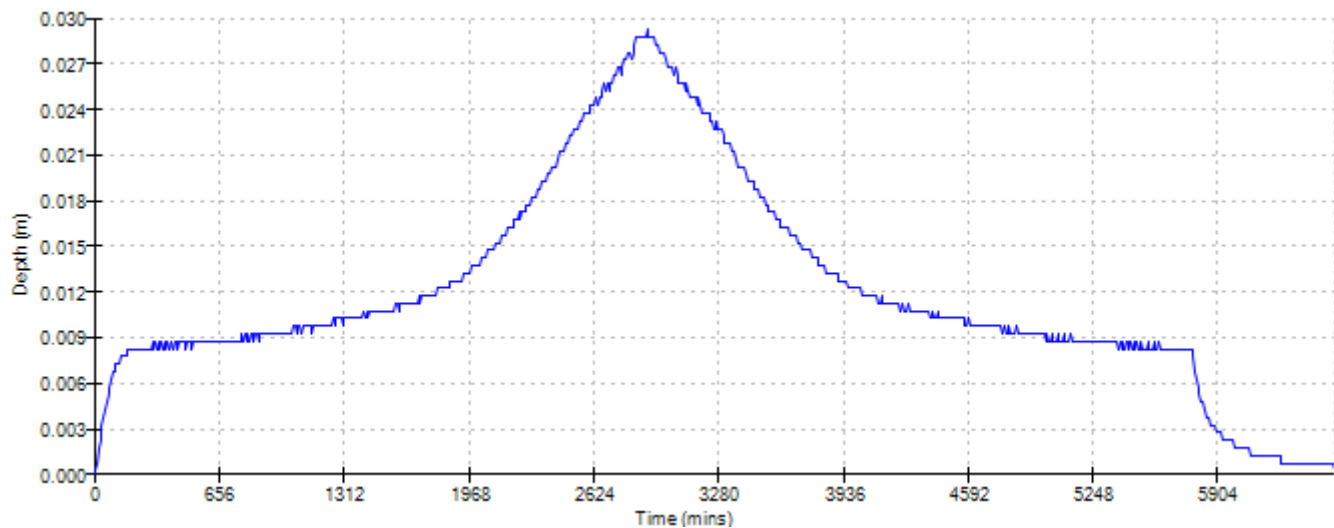
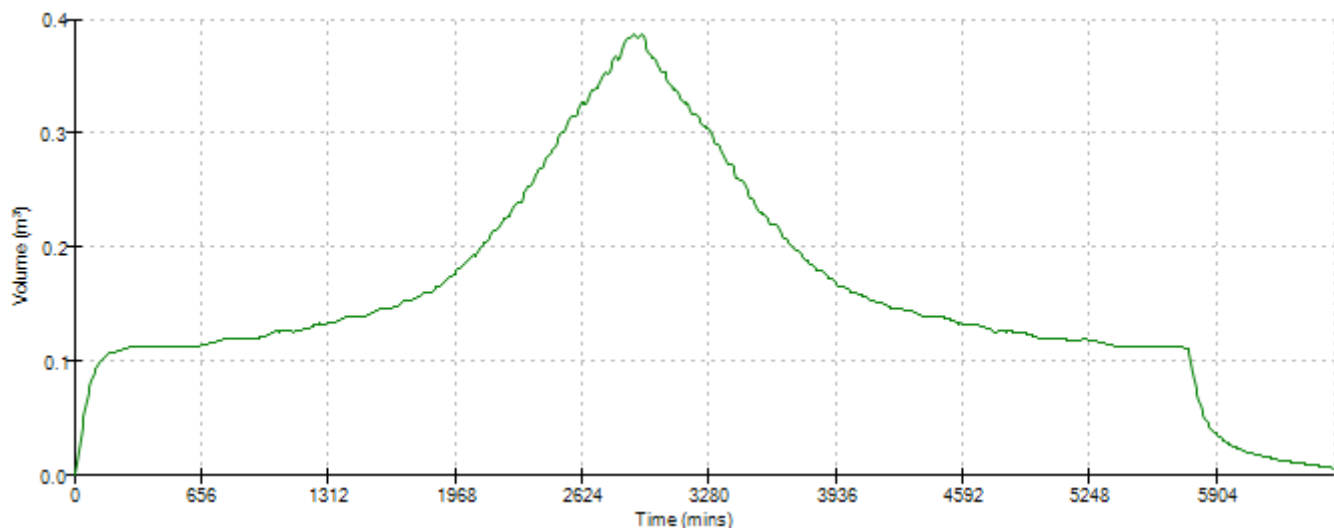
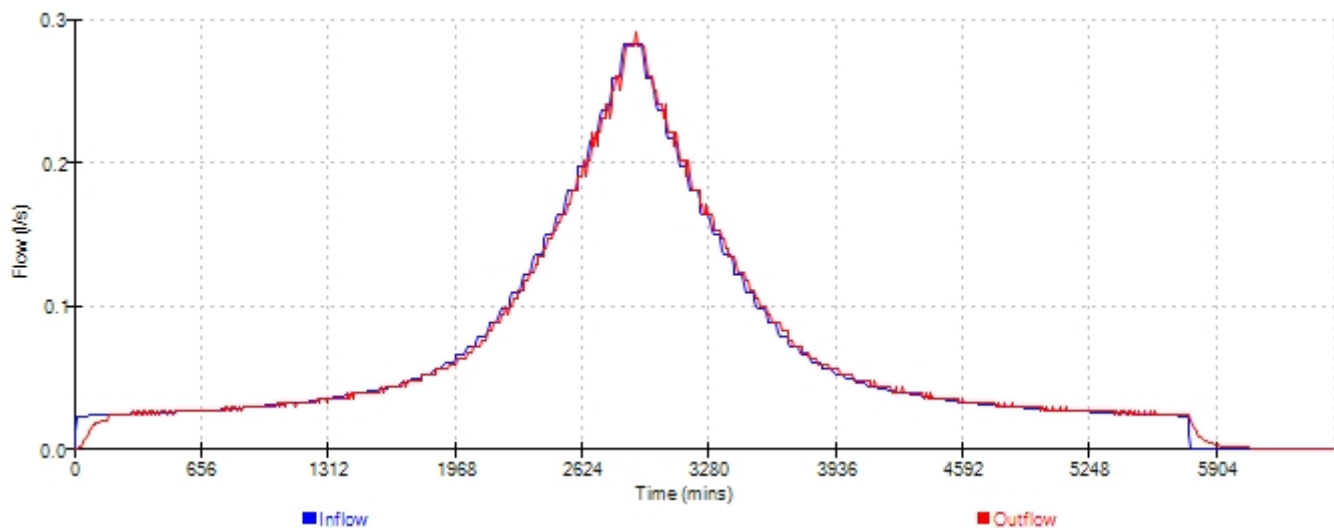
Event: 2880 min Summer



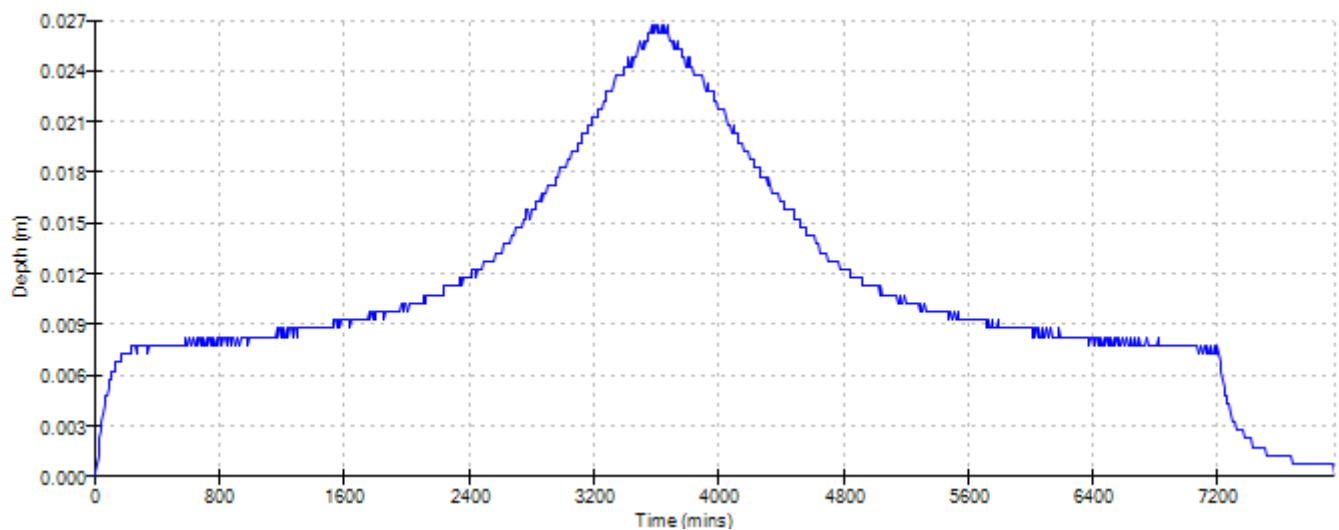
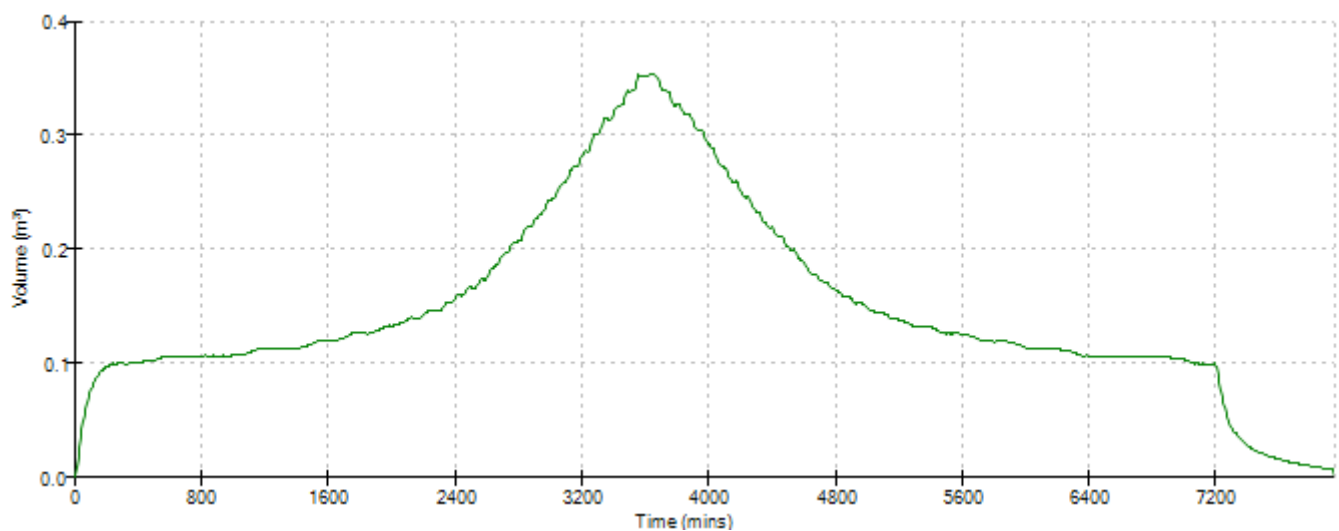
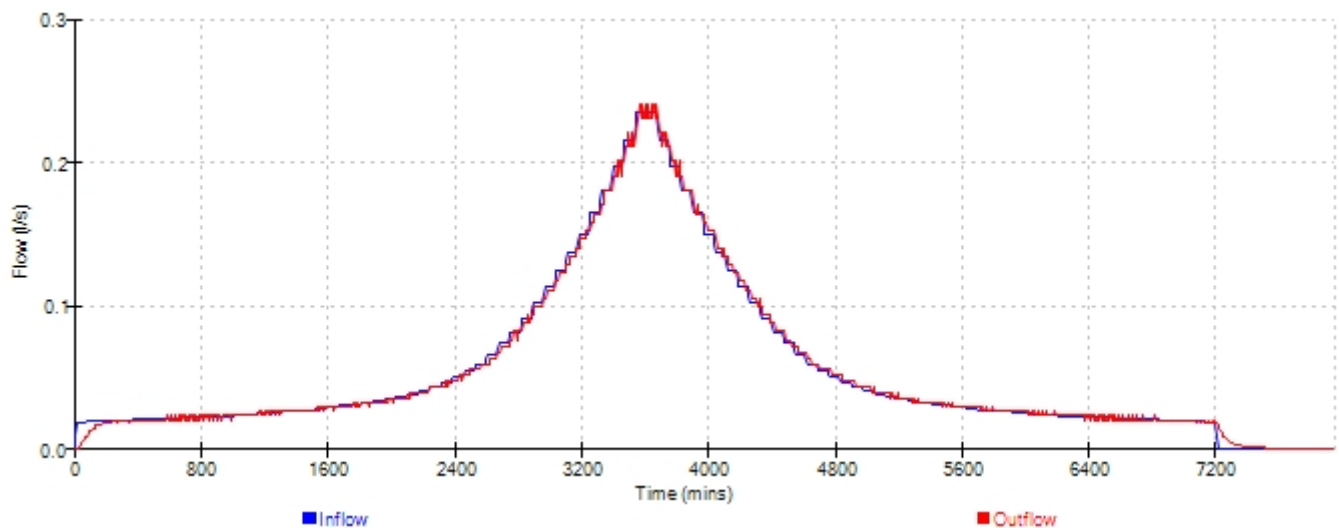
Event: 4320 min Summer



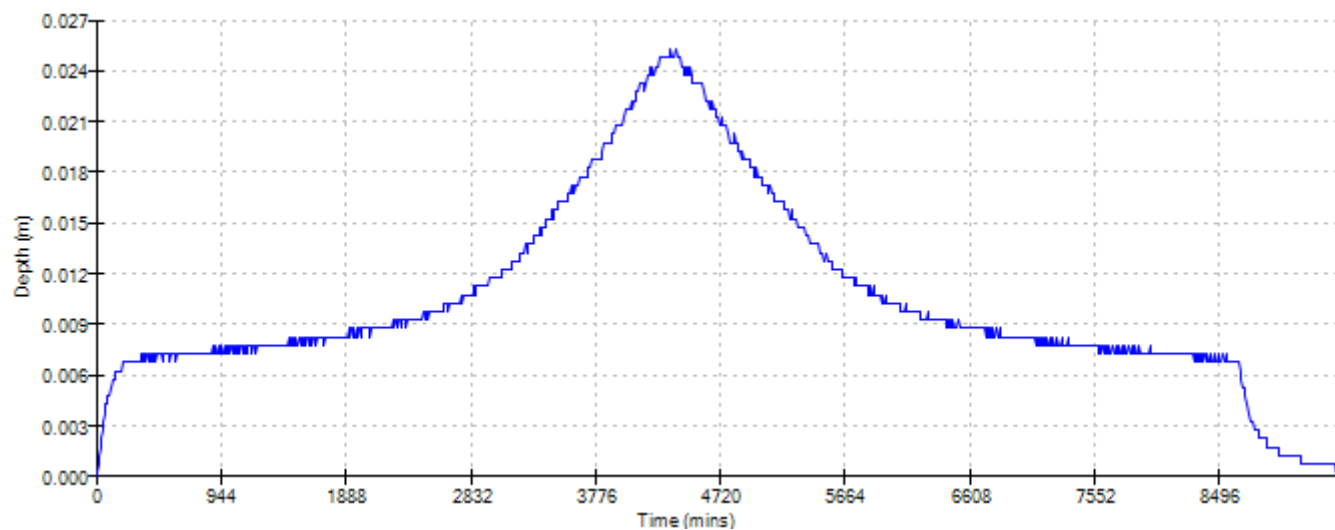
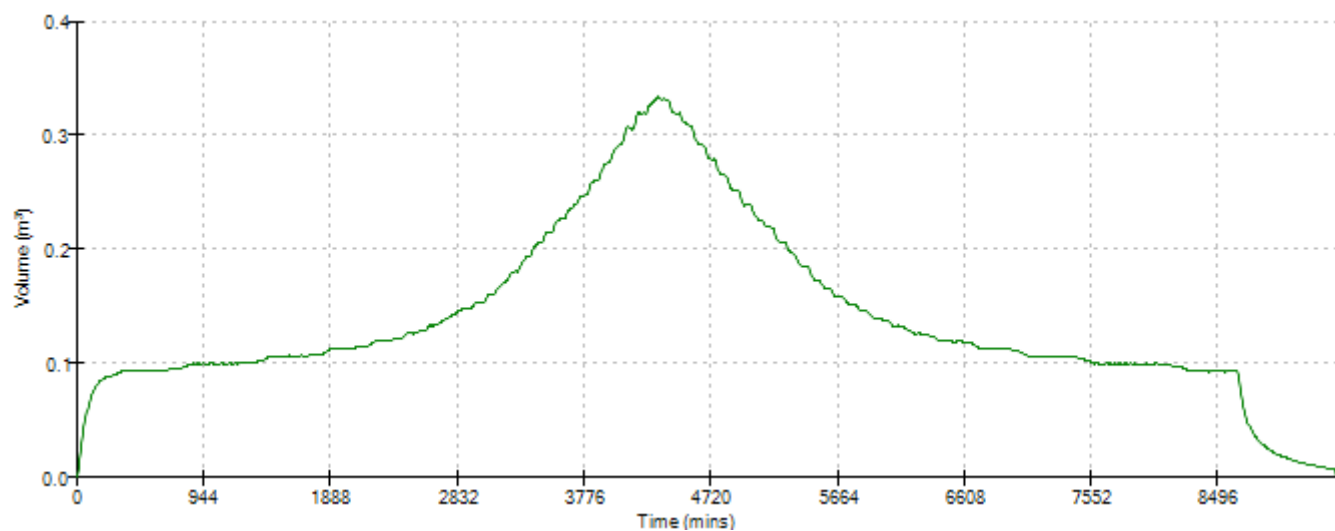
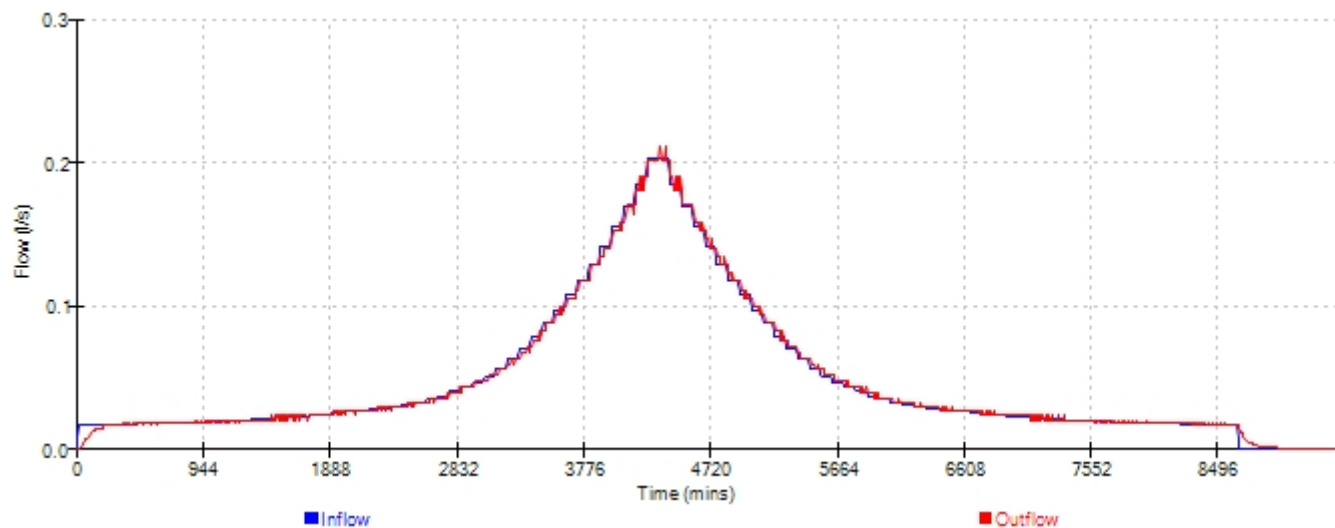
Event: 5760 min Summer



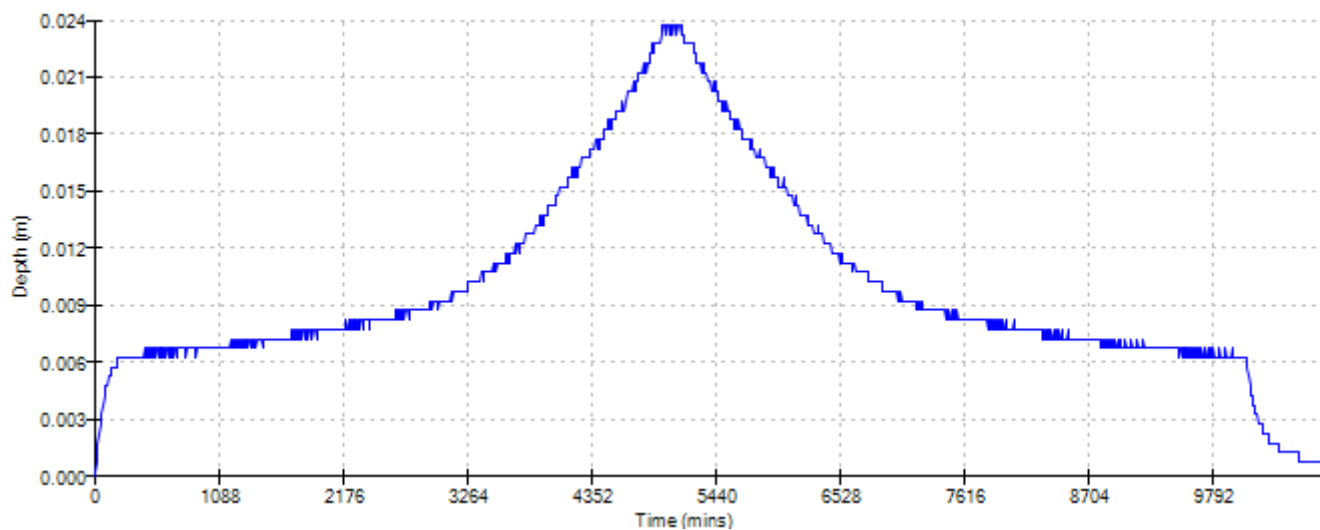
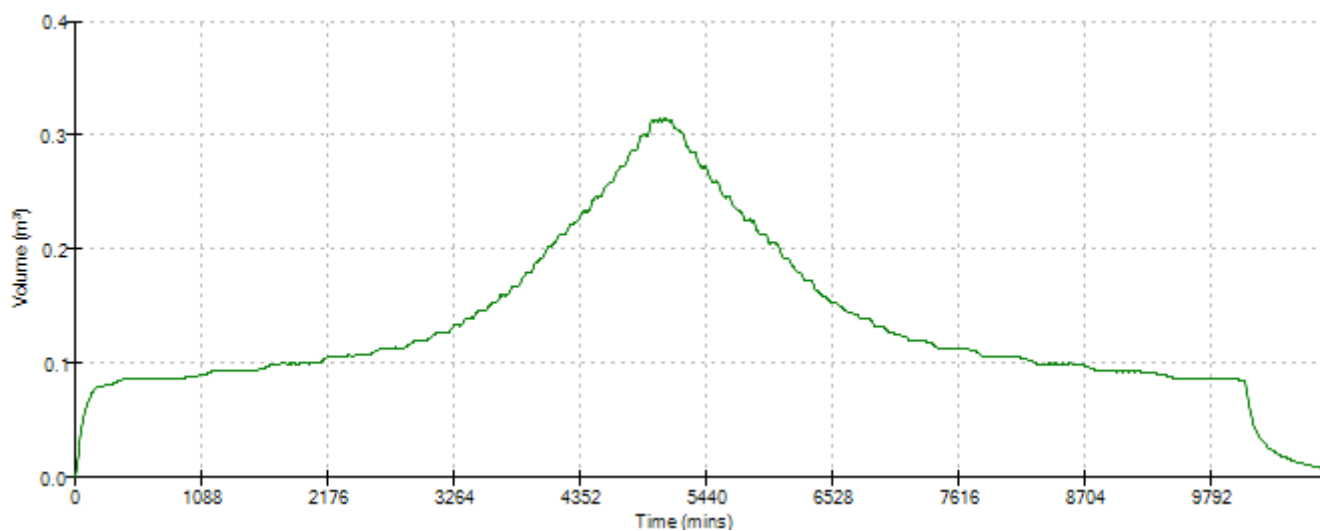
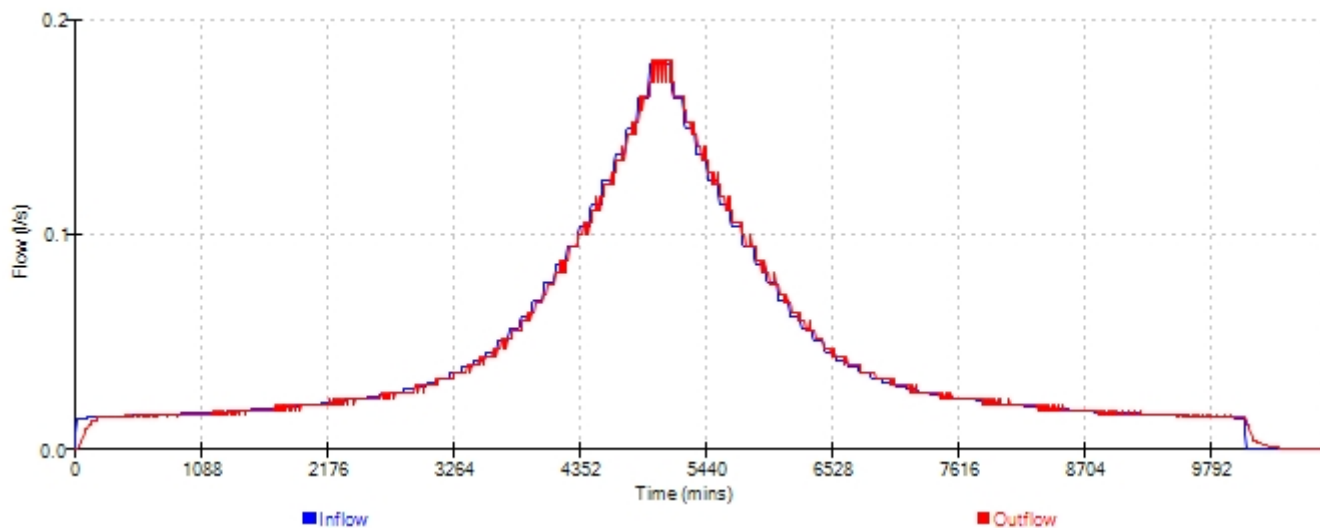
Event: 7200 min Summer



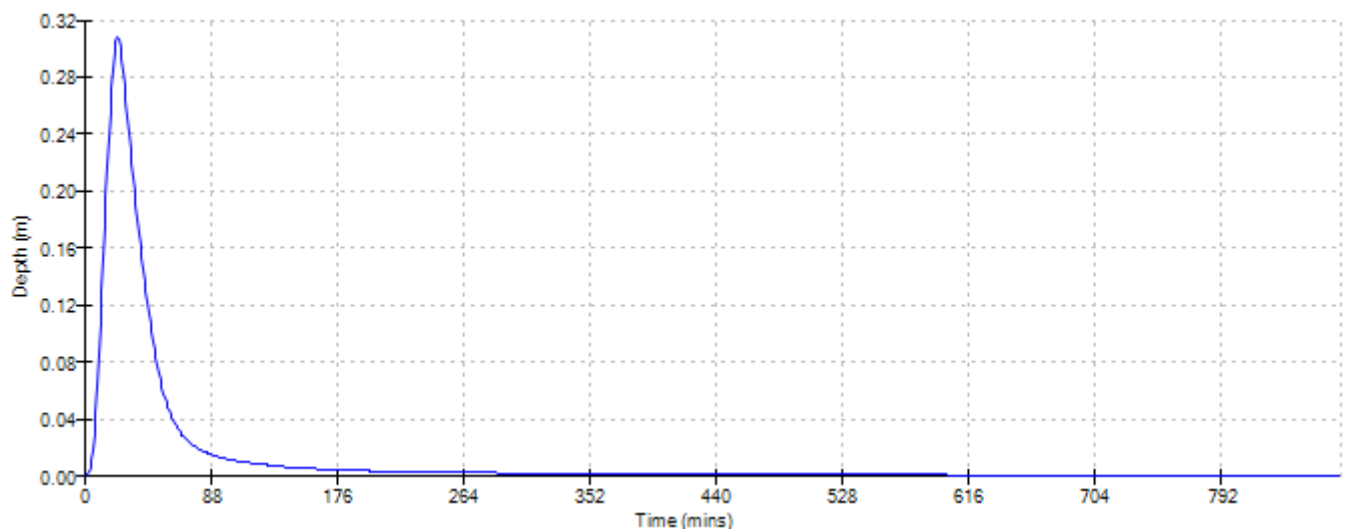
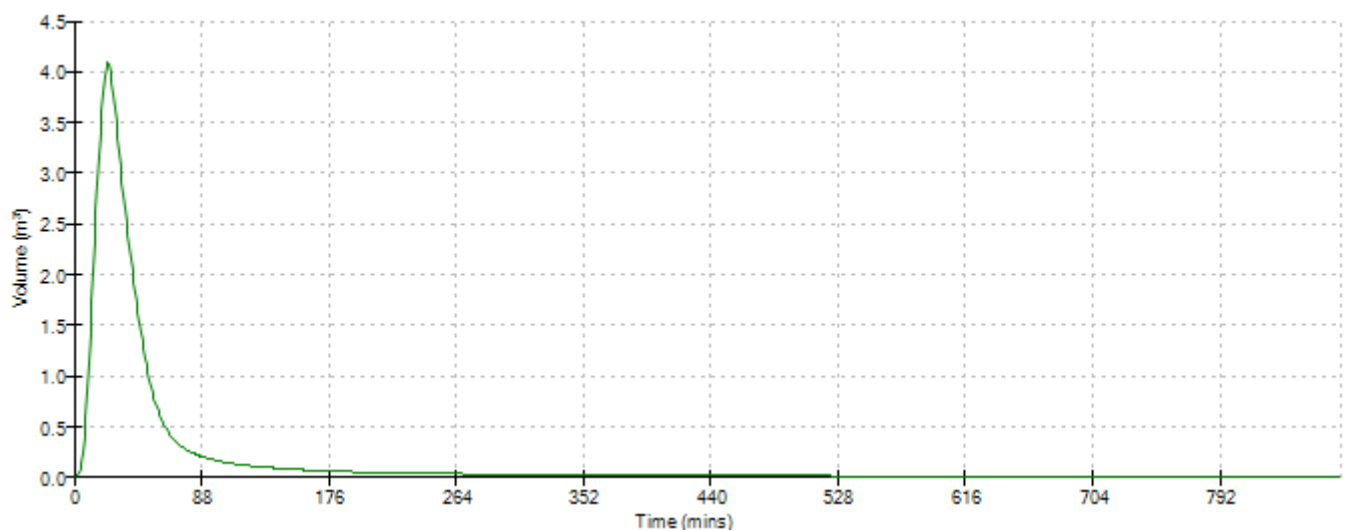
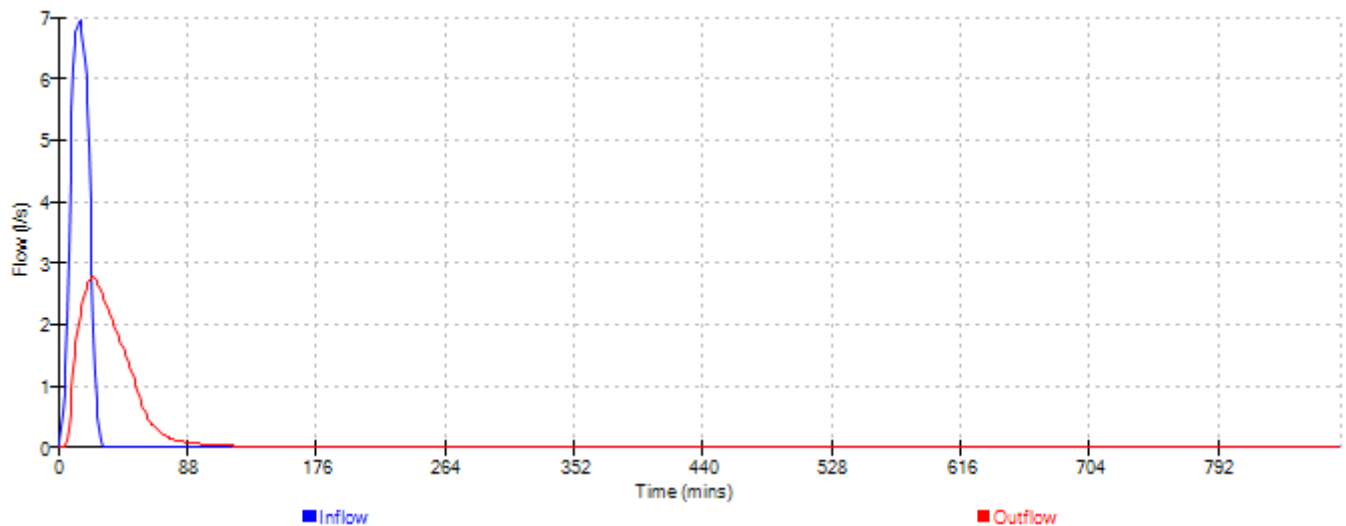
Event: 8640 min Summer



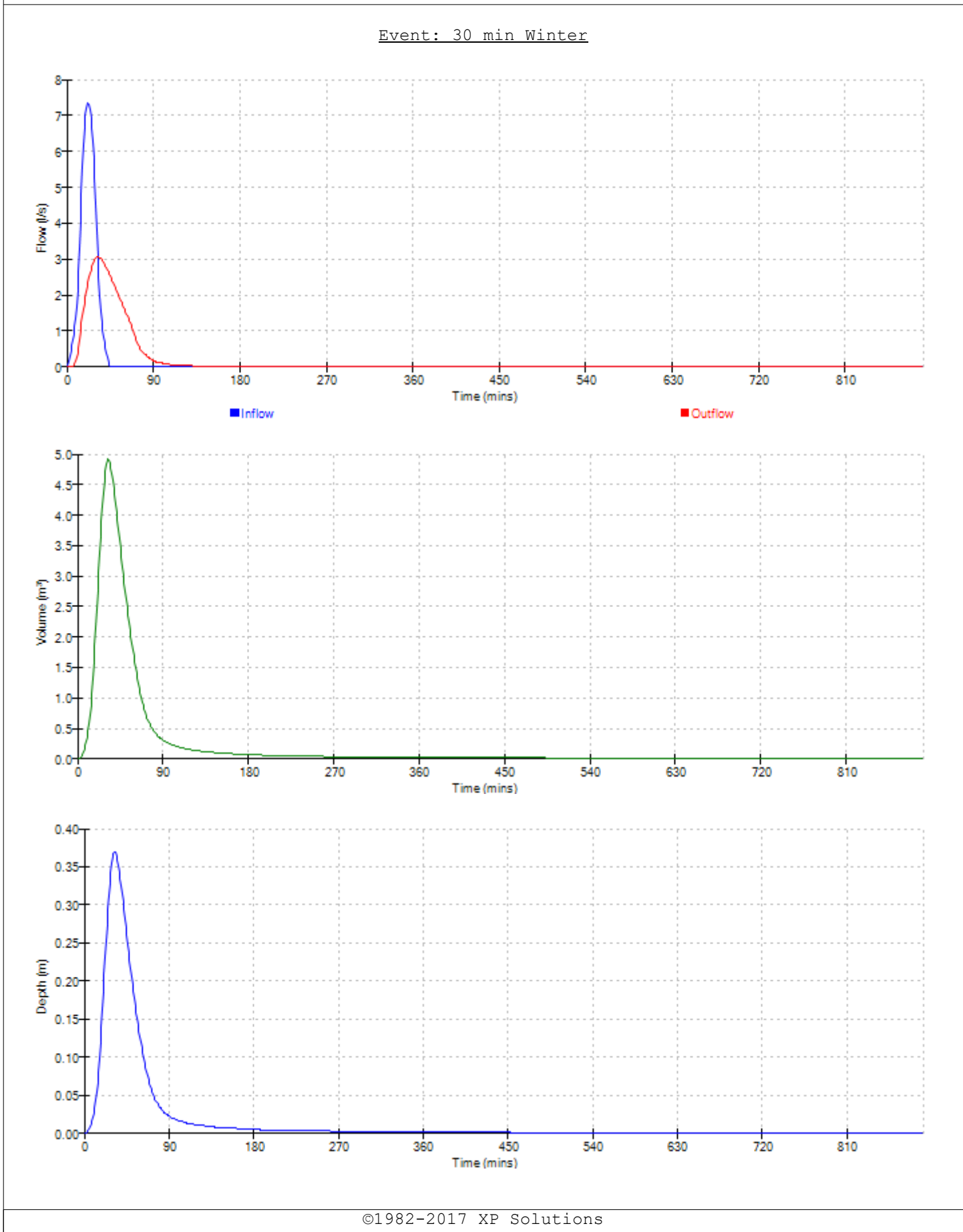
Event: 10080 min Summer



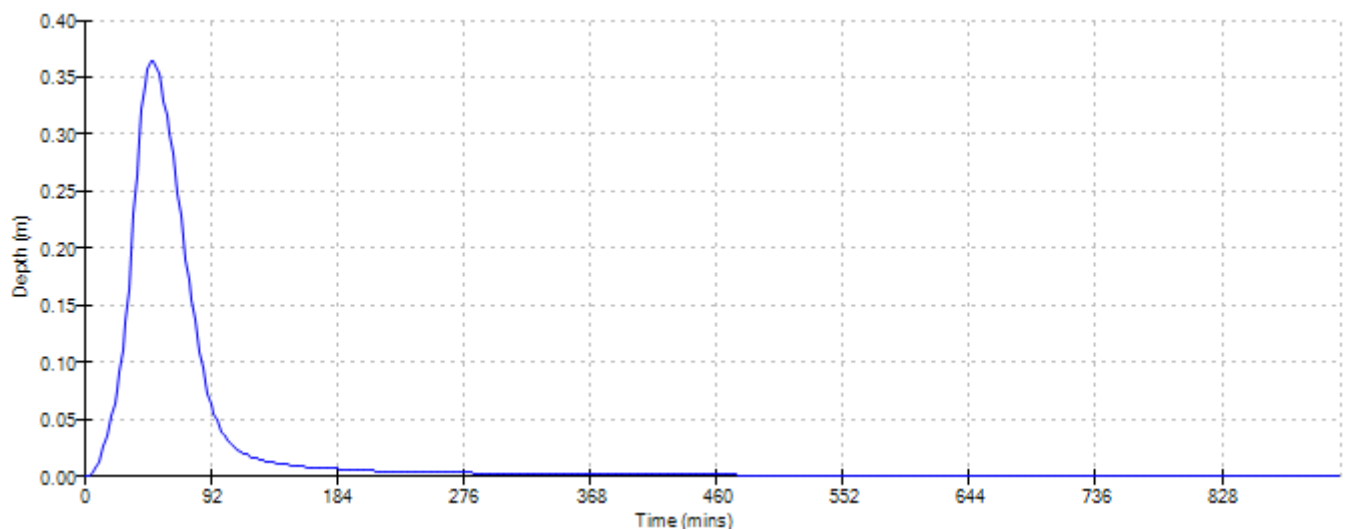
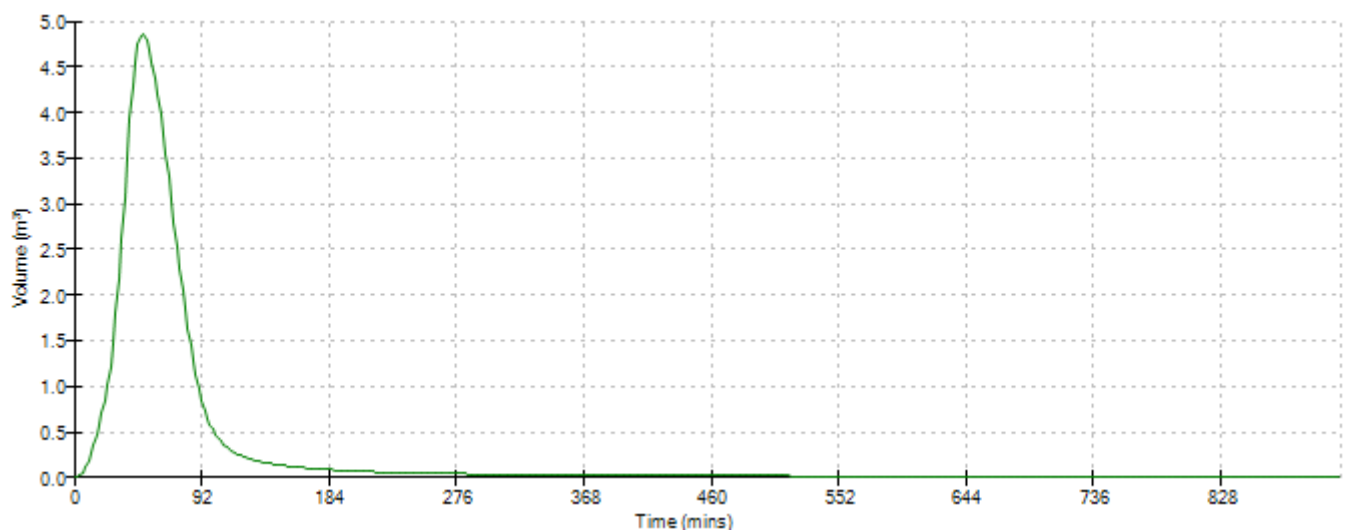
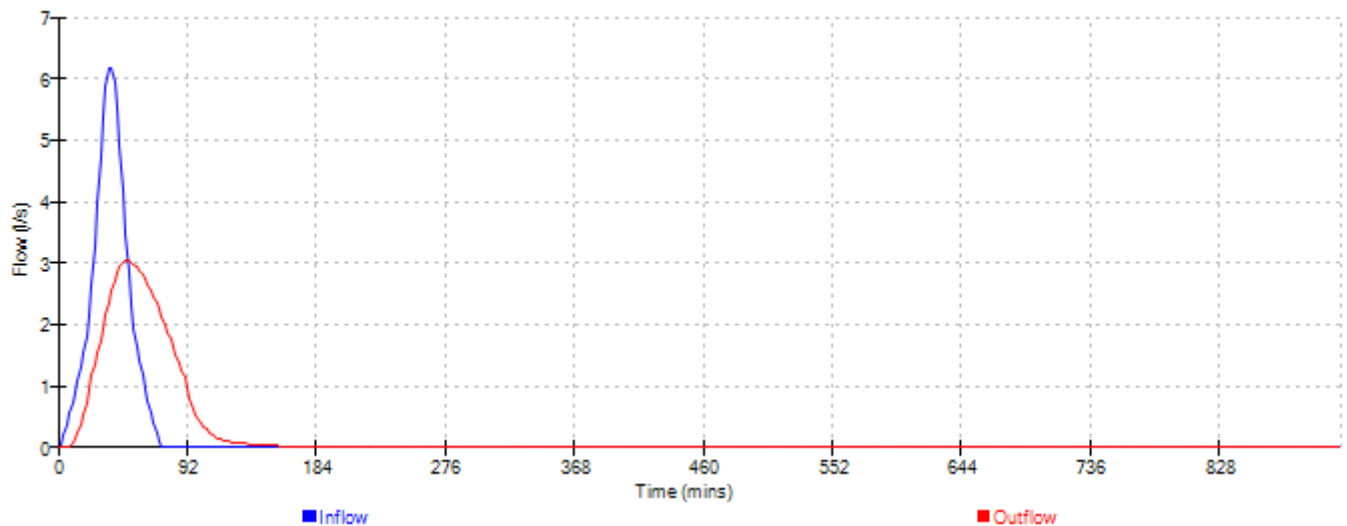
Event: 15 min Winter



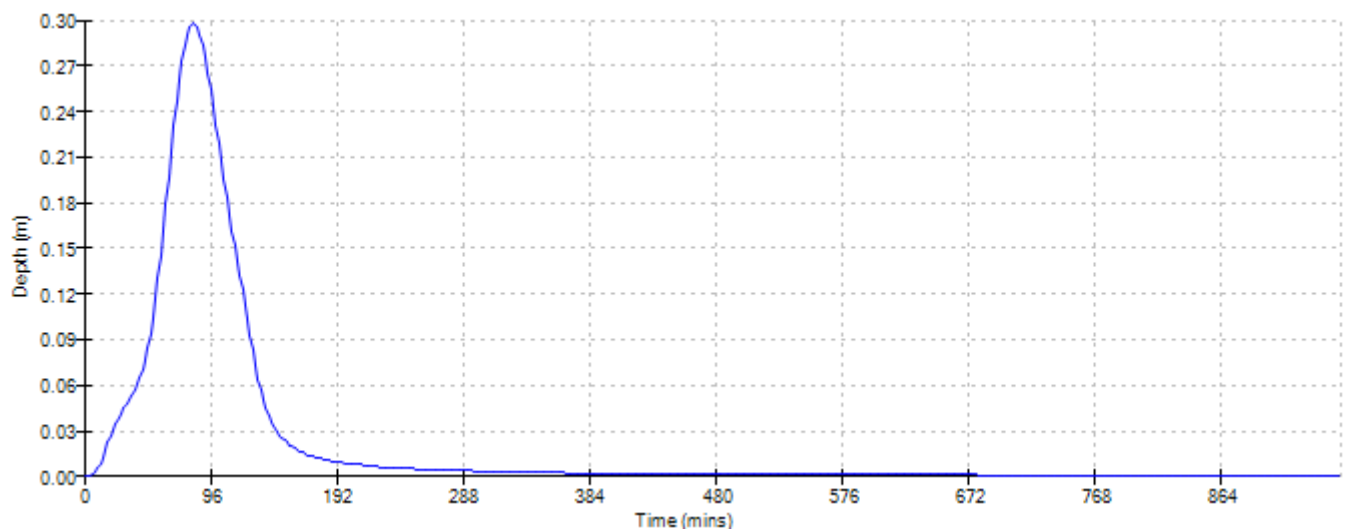
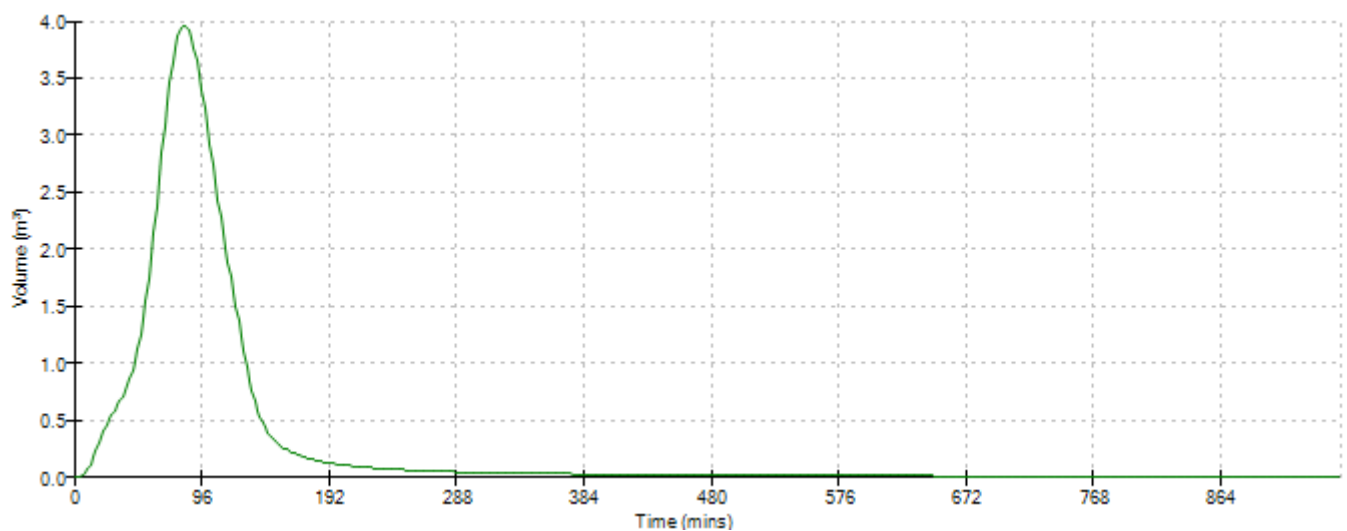
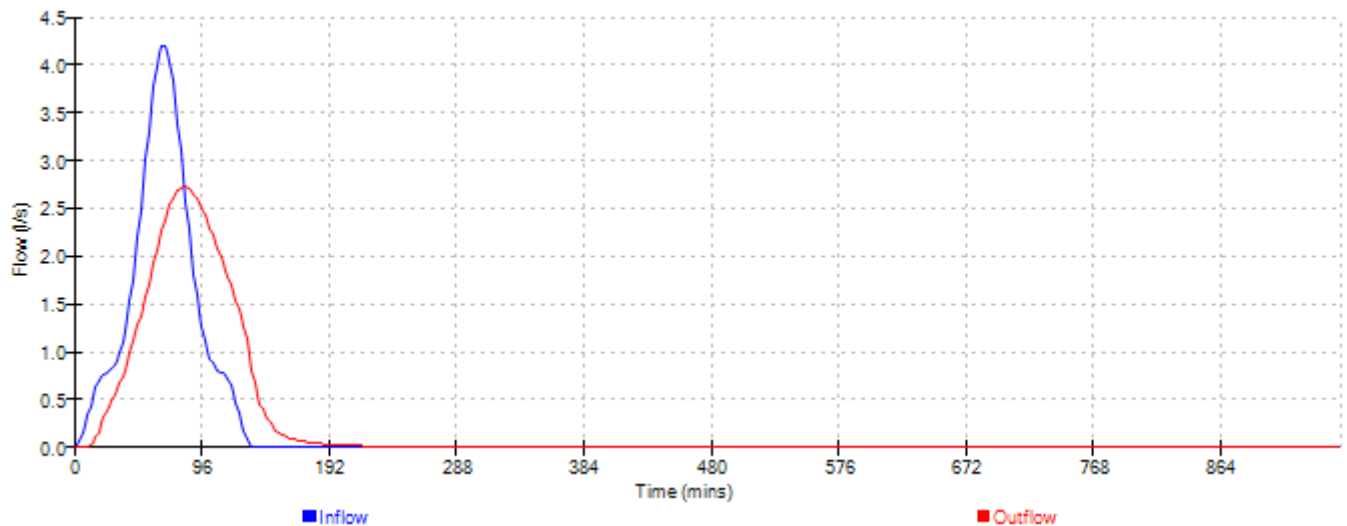
G30 Consulting Ltd		Page 25
Unit 6 Neepsend Triangle Business 1 Burton Road Sheffield S3 8BW	Garage Site, The Glebe West Drayton Surface Water Attenuation	
Date 25/03/2019	Designed by S. Griffiths	
File CELLULAR CRATE ATTENUATION	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	



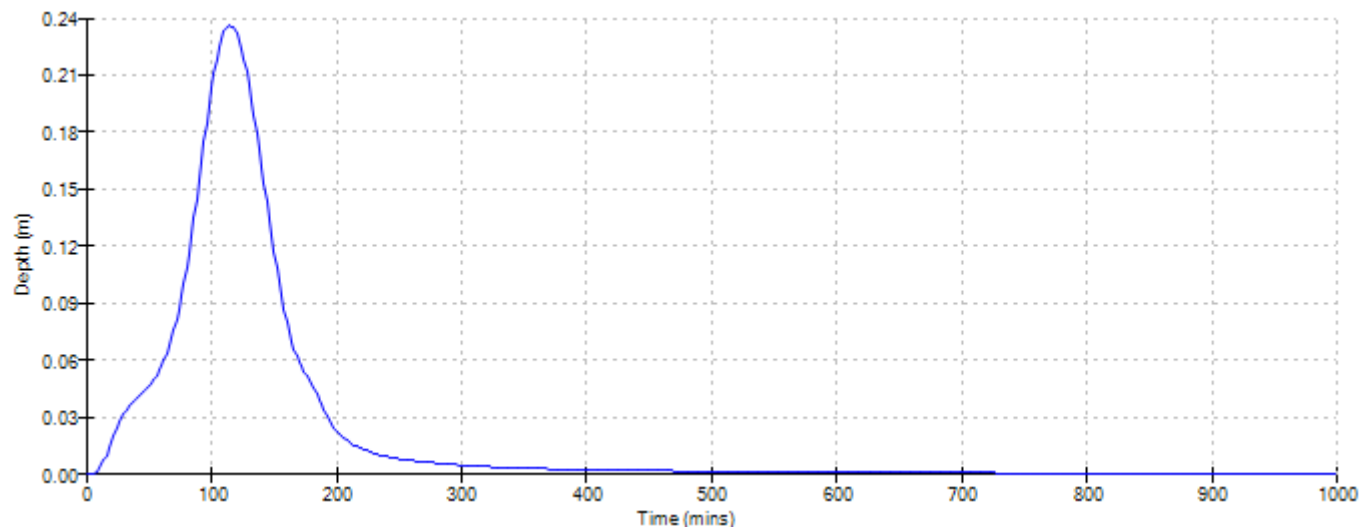
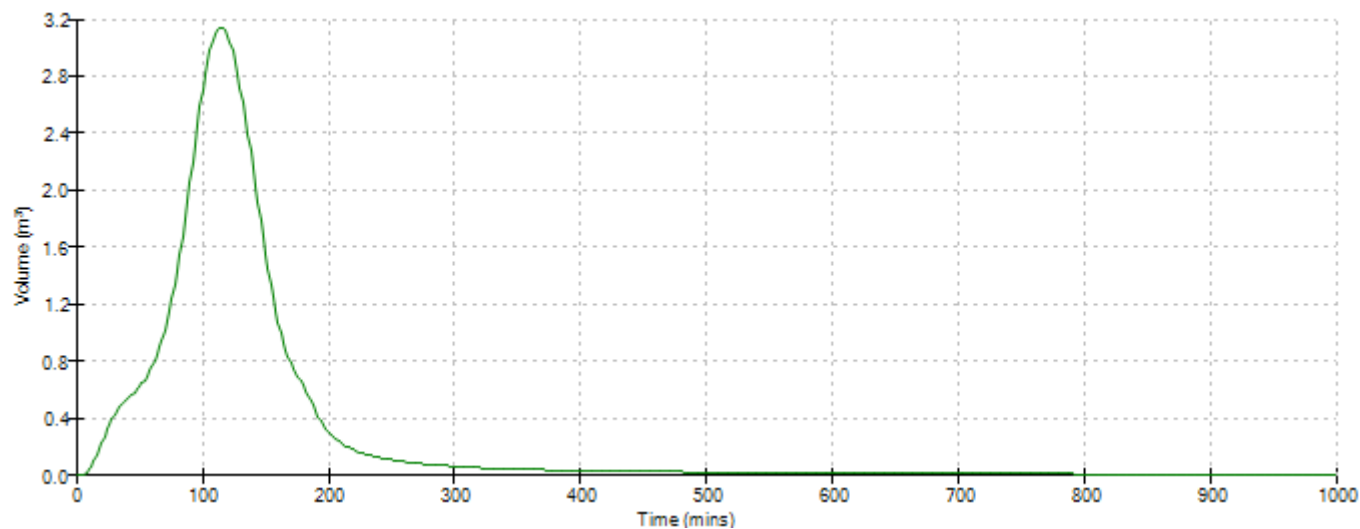
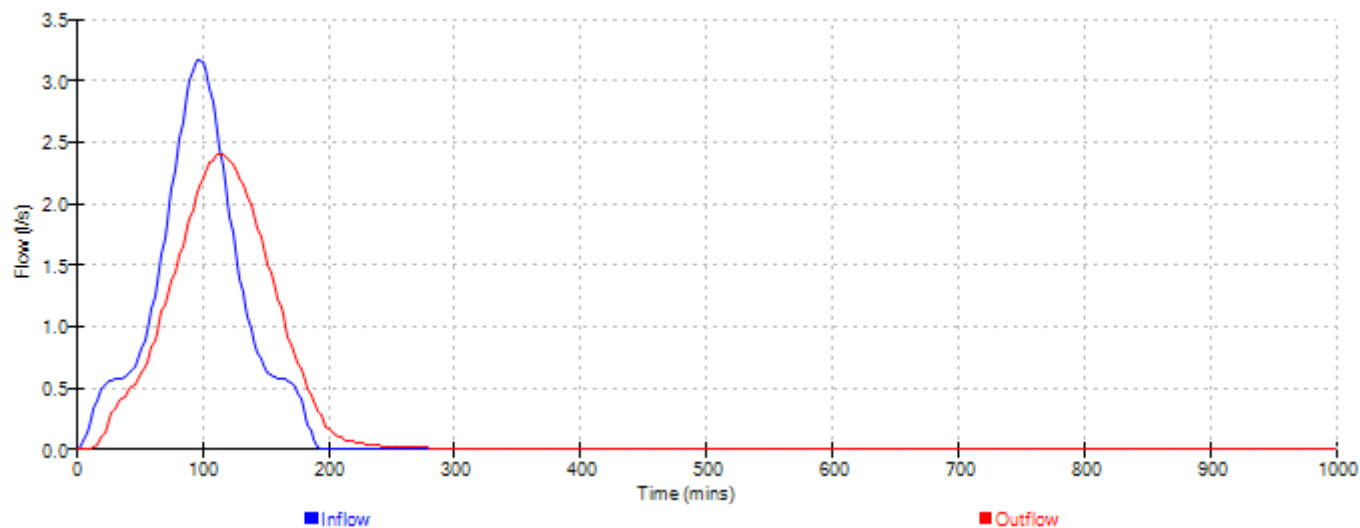
Event: 60 min Winter



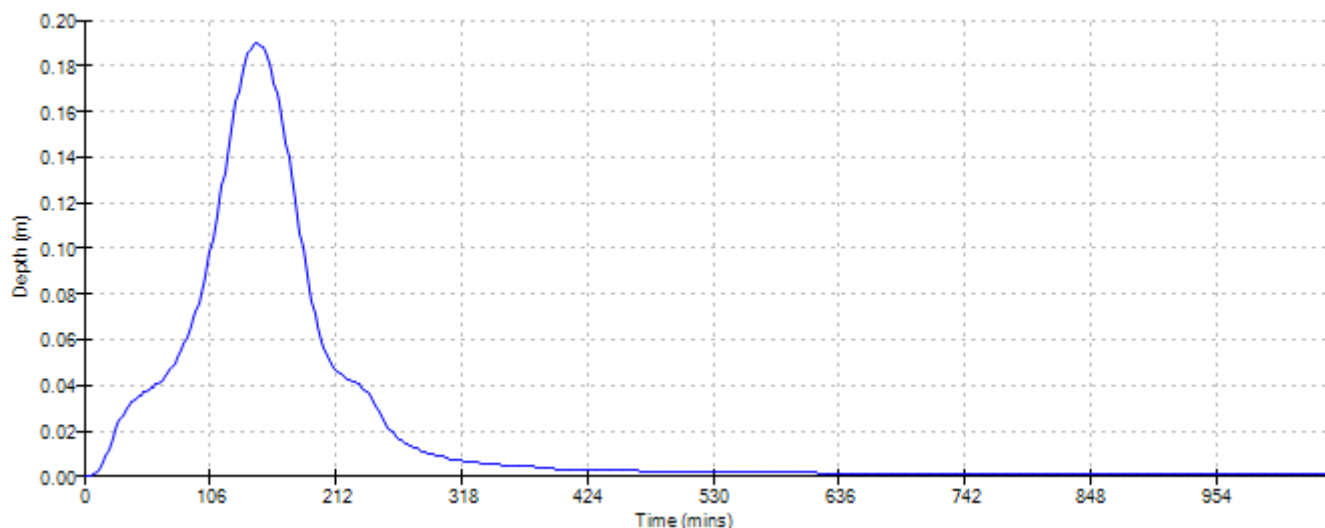
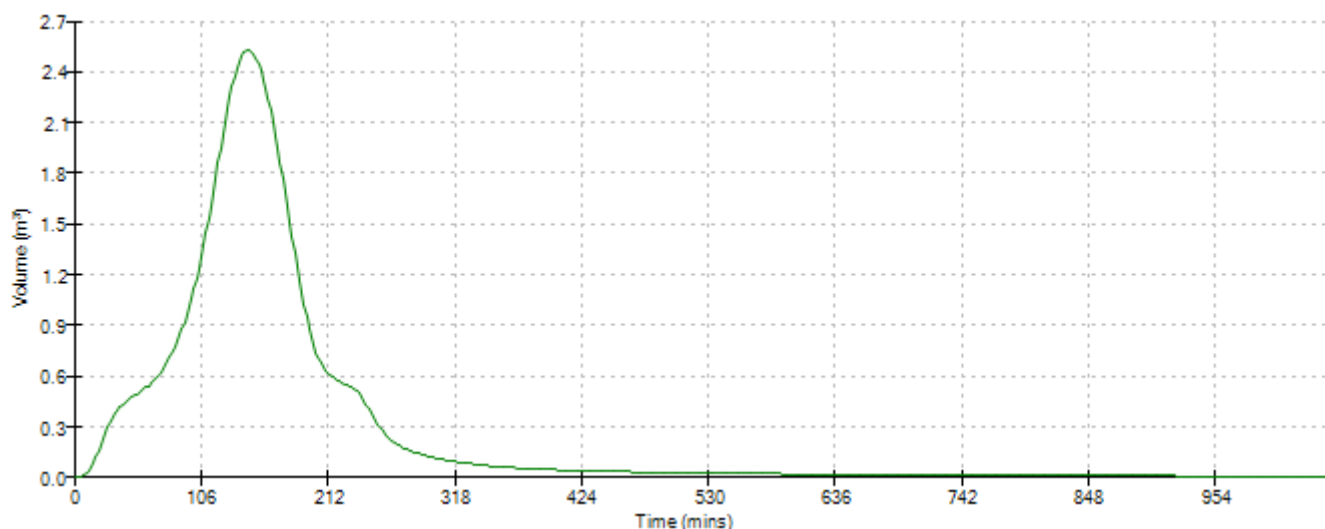
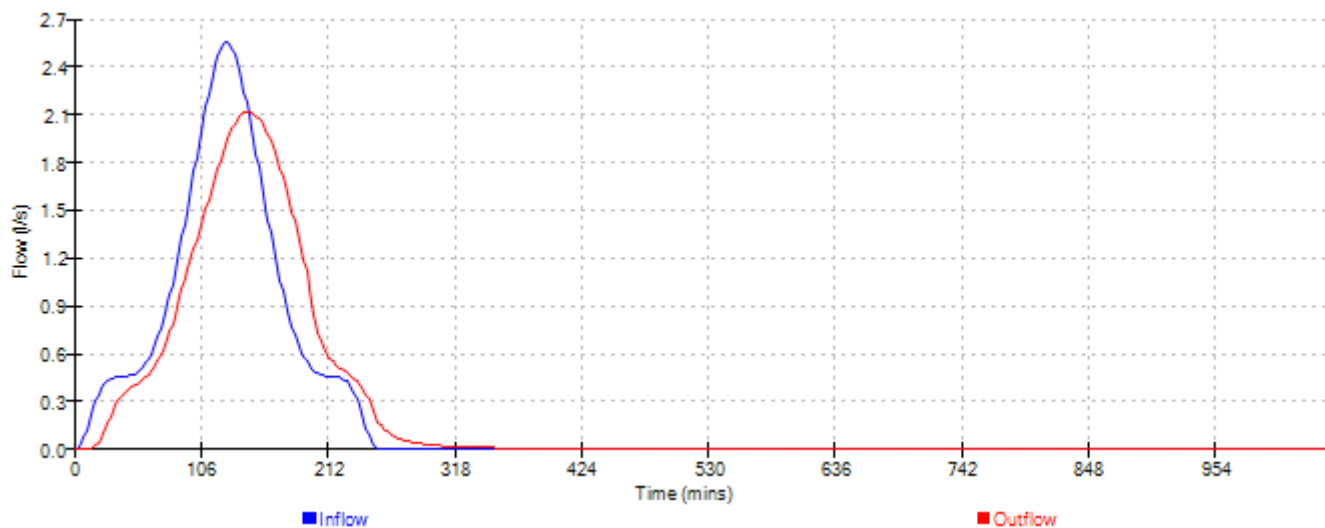
Event: 120 min Winter



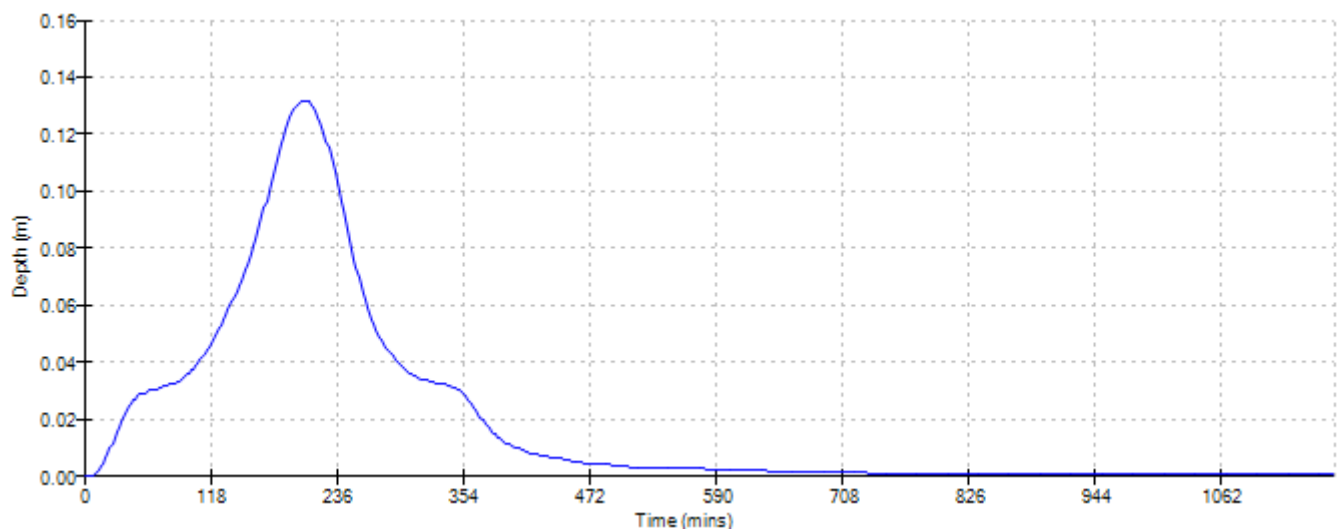
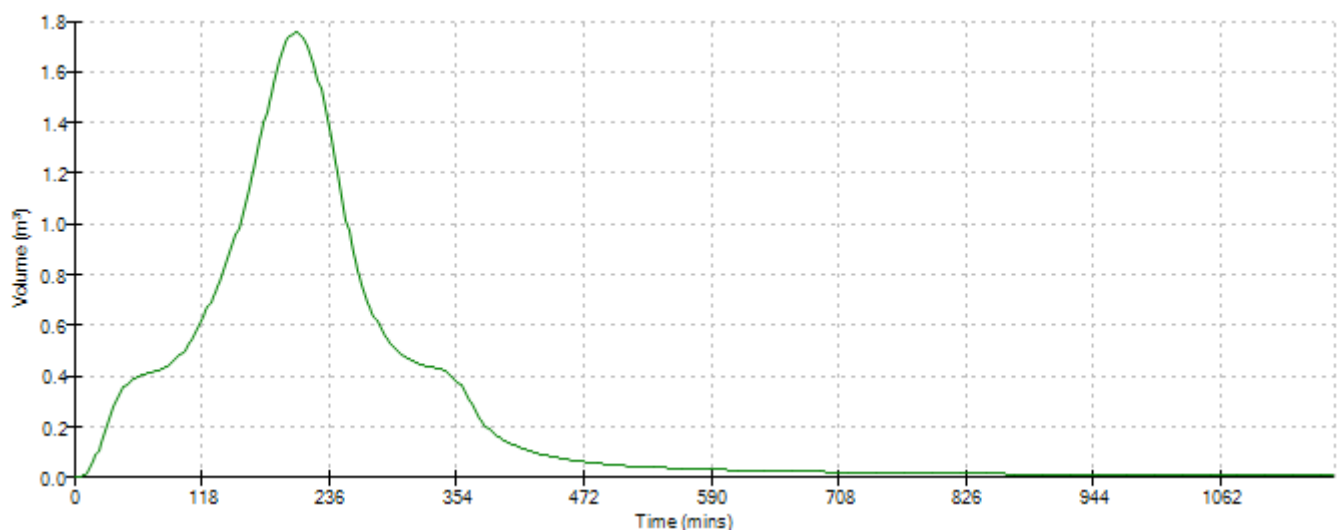
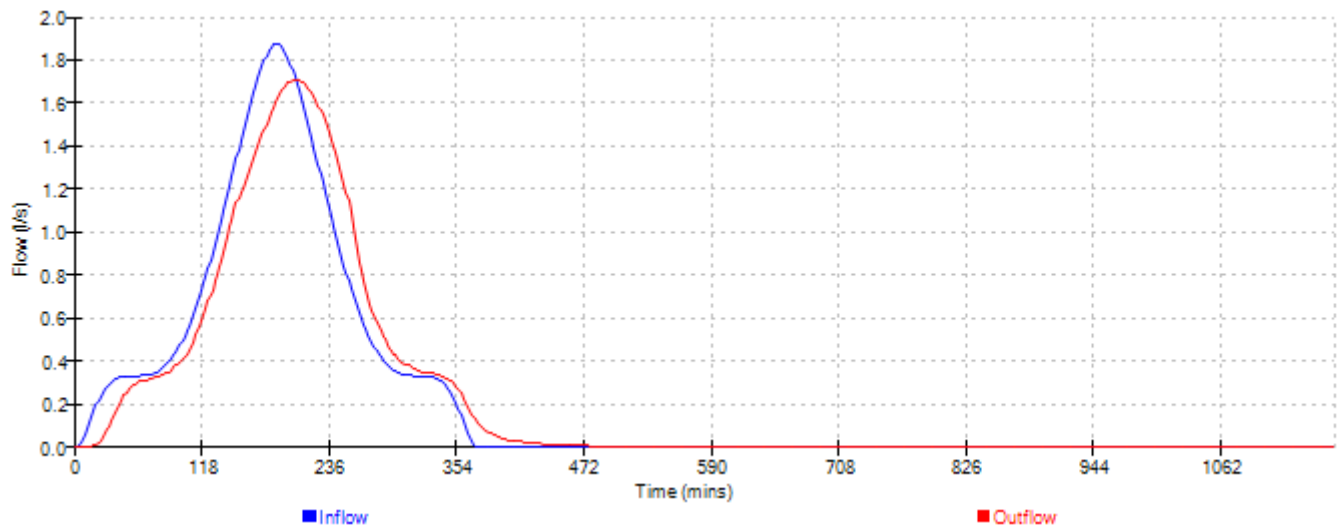
Event: 180 min Winter



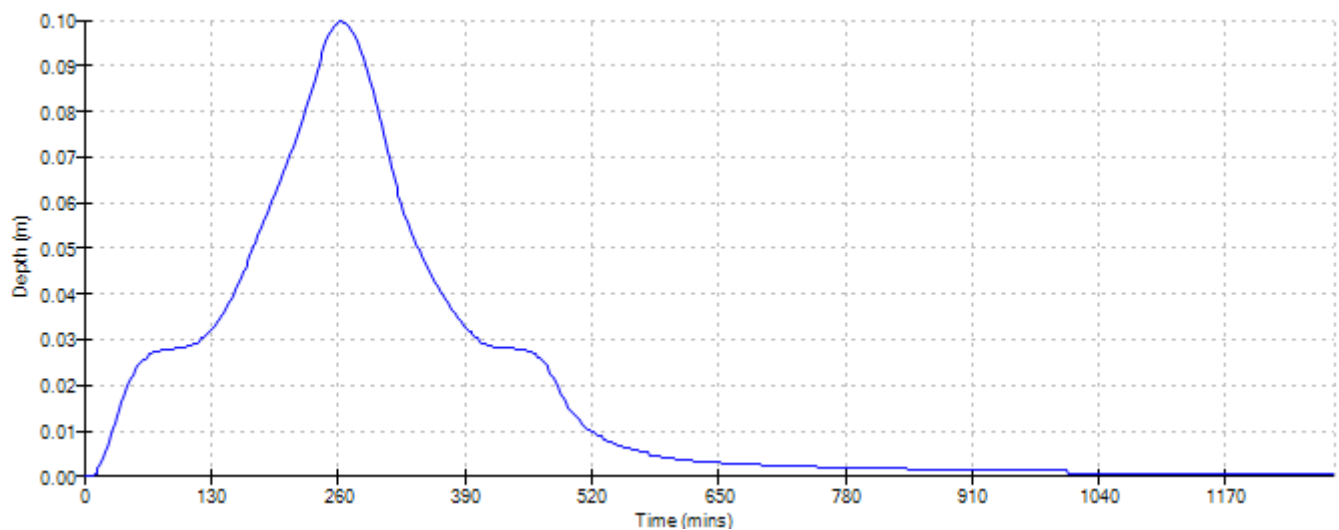
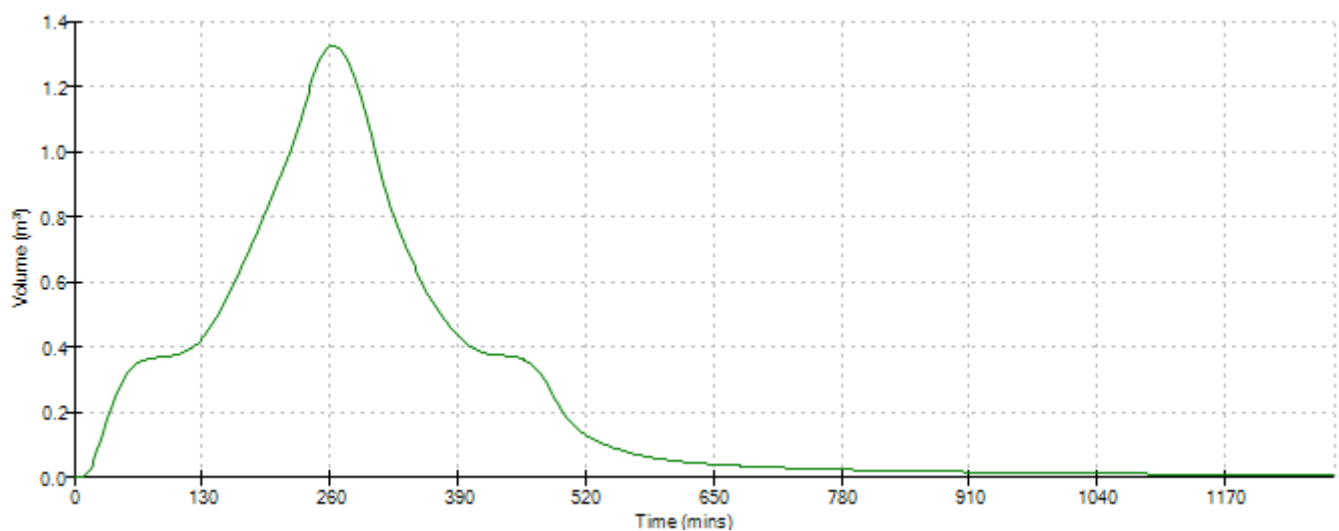
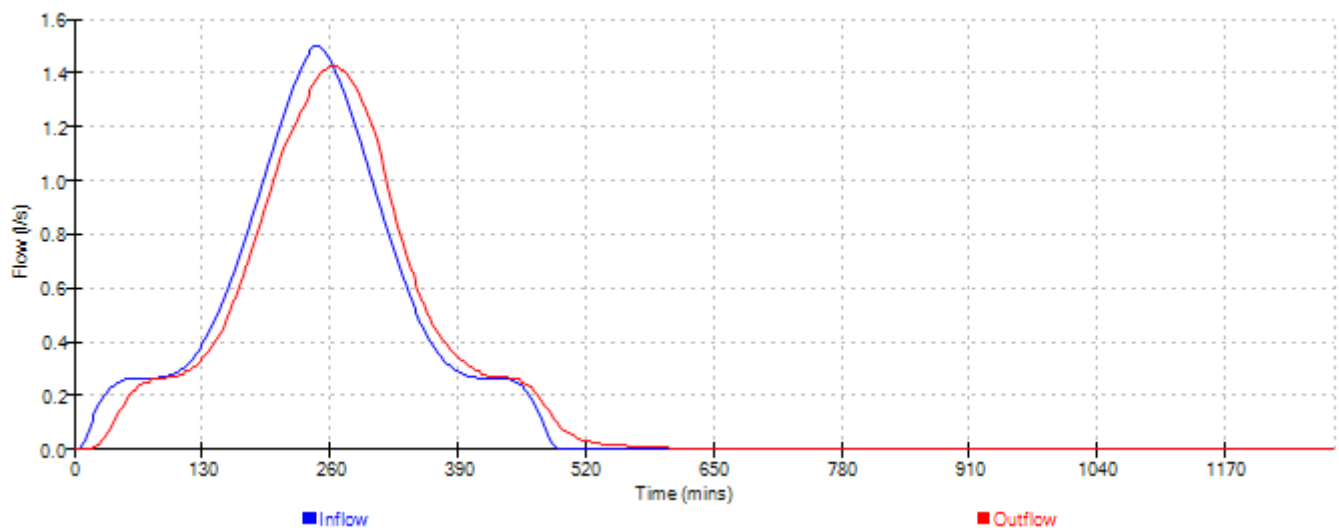
Event: 240 min Winter



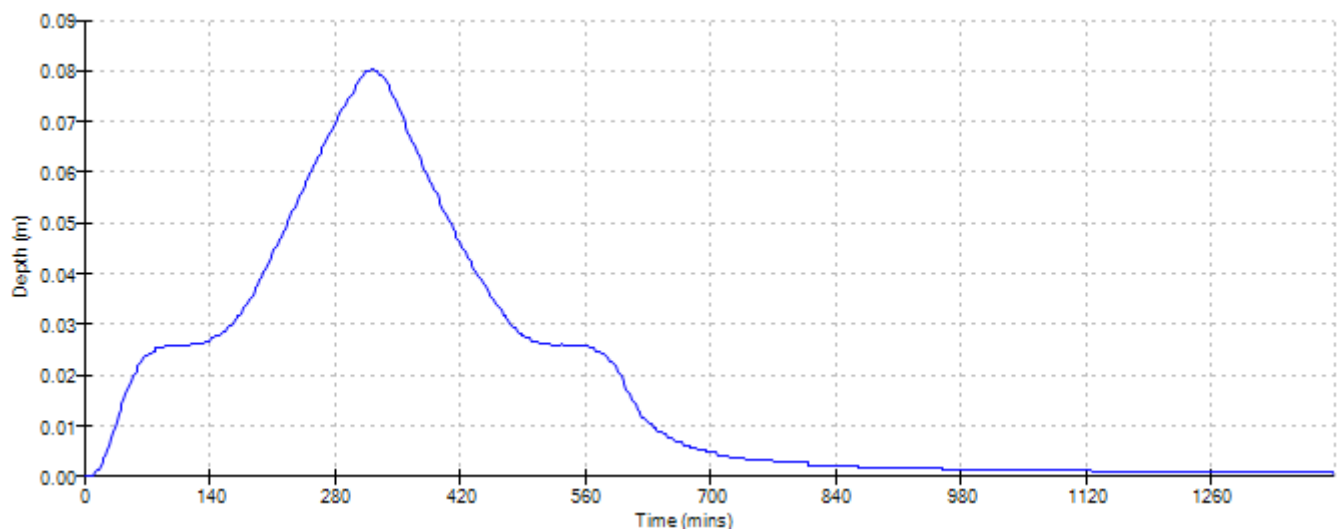
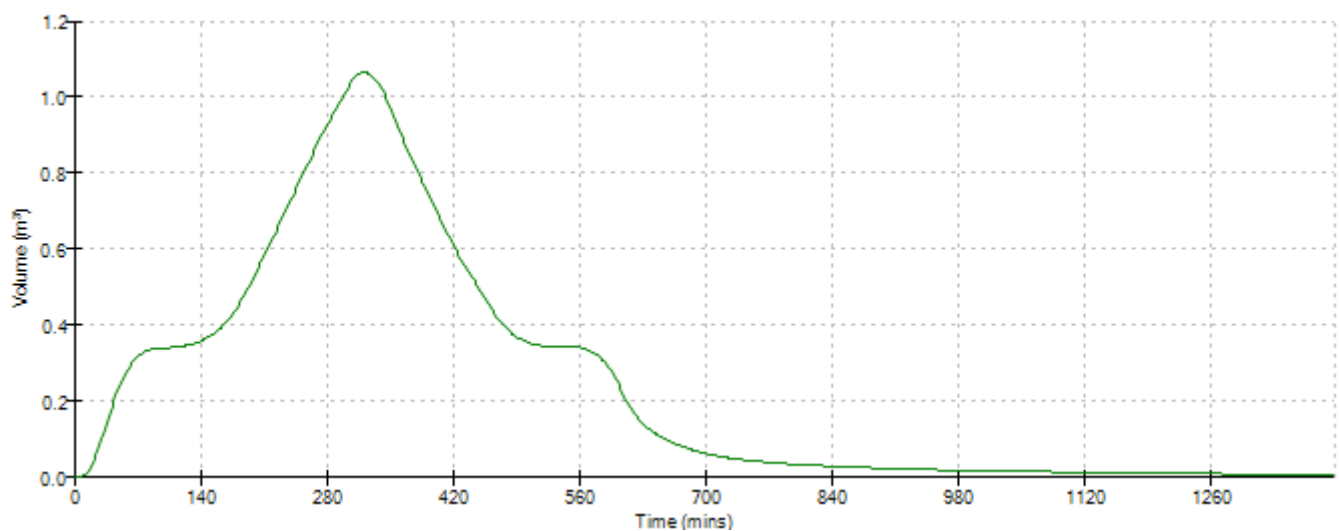
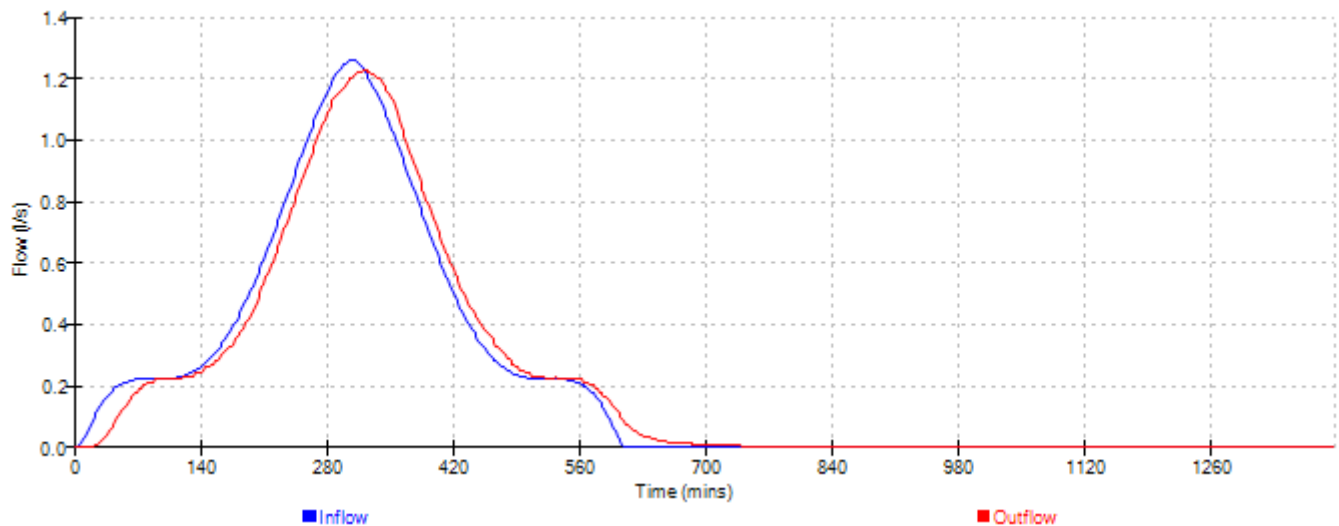
Event: 360 min Winter



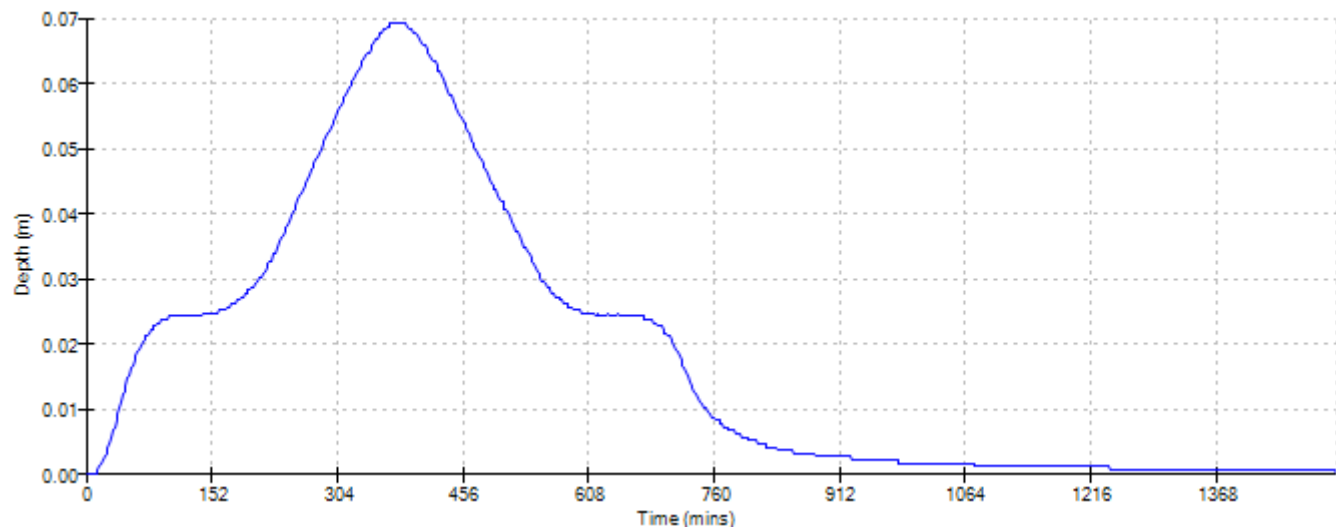
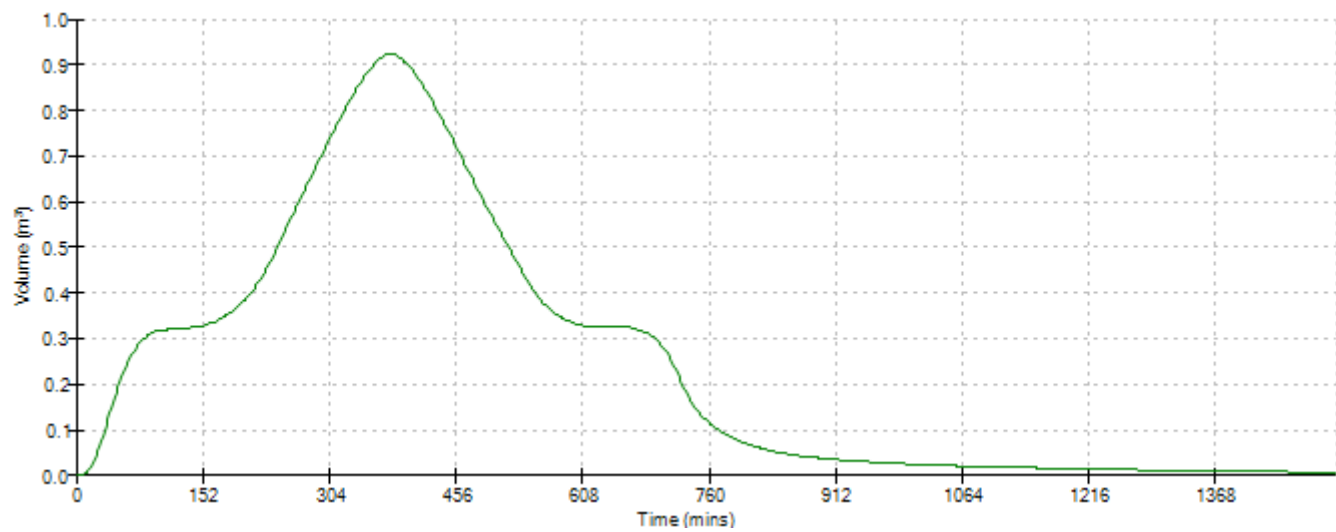
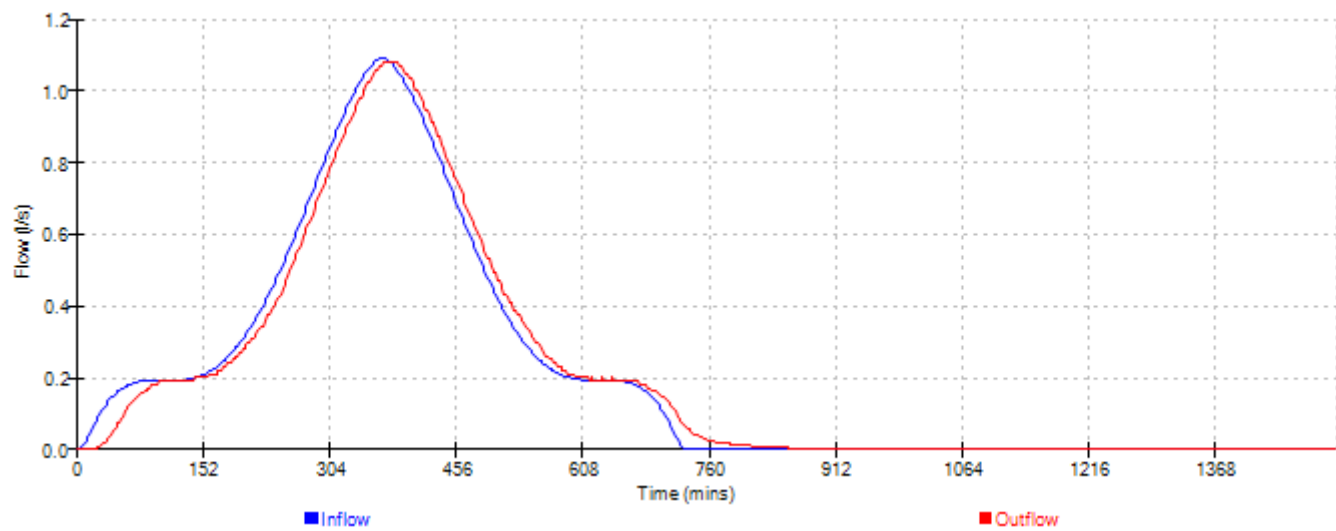
Event: 480 min Winter



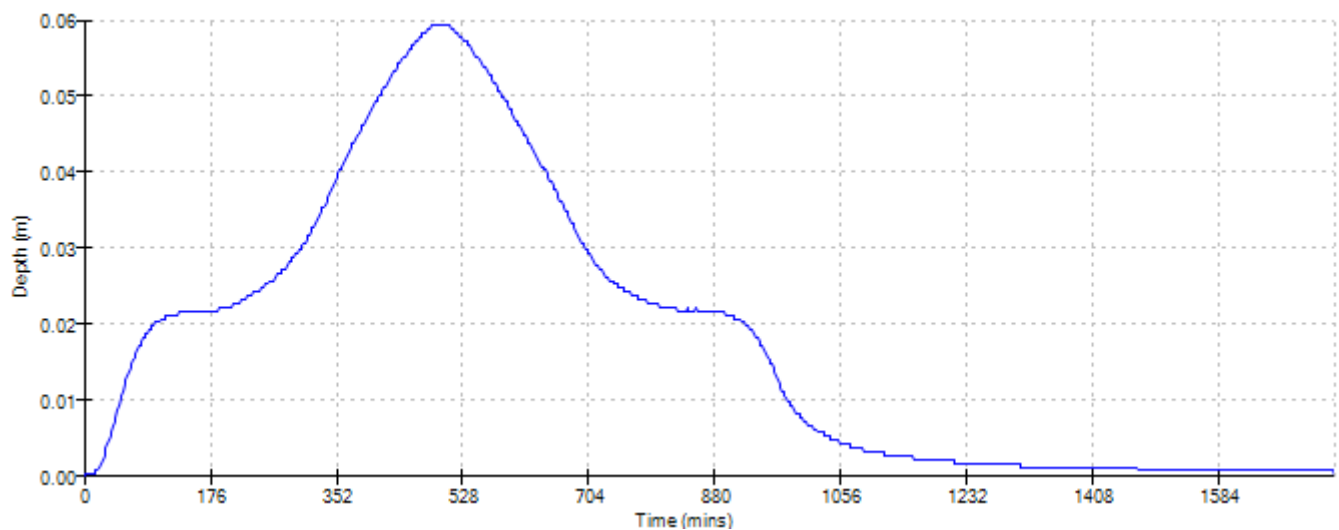
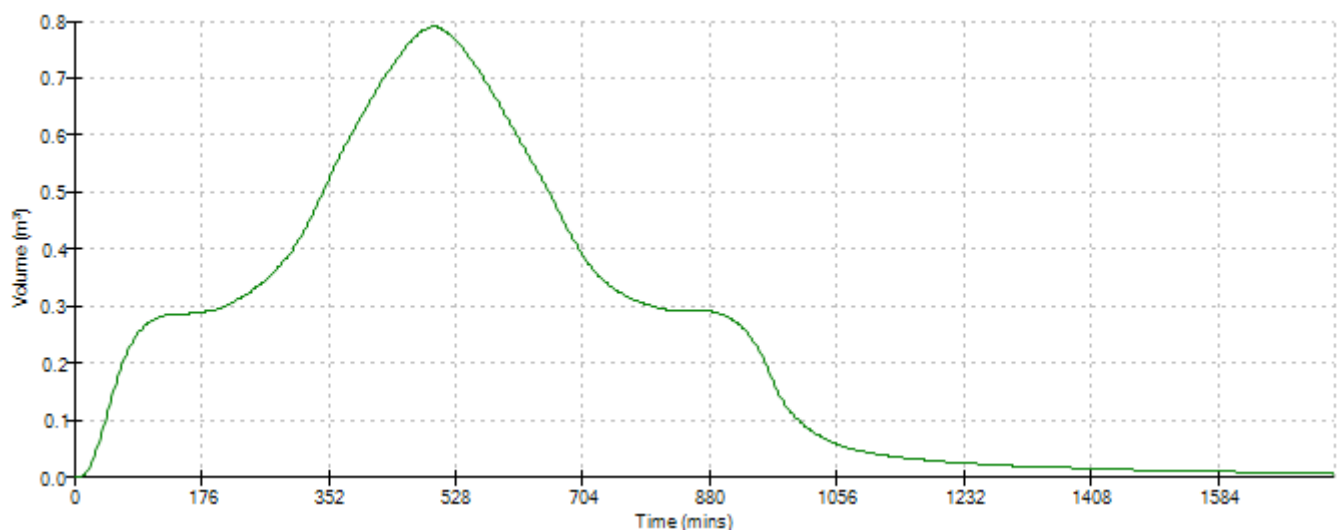
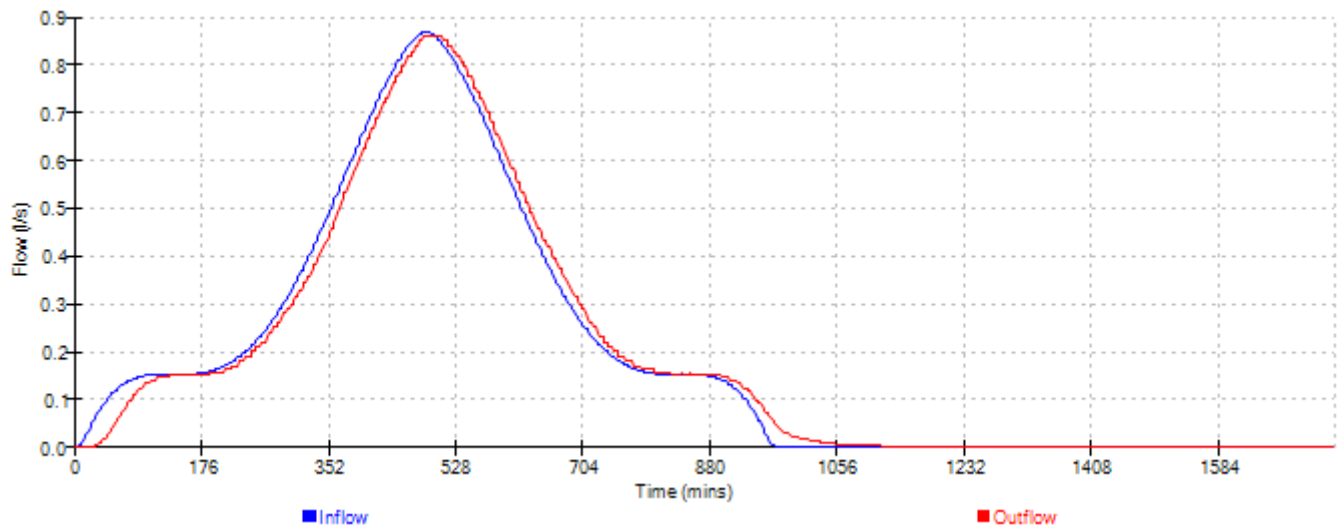
Event: 600 min Winter



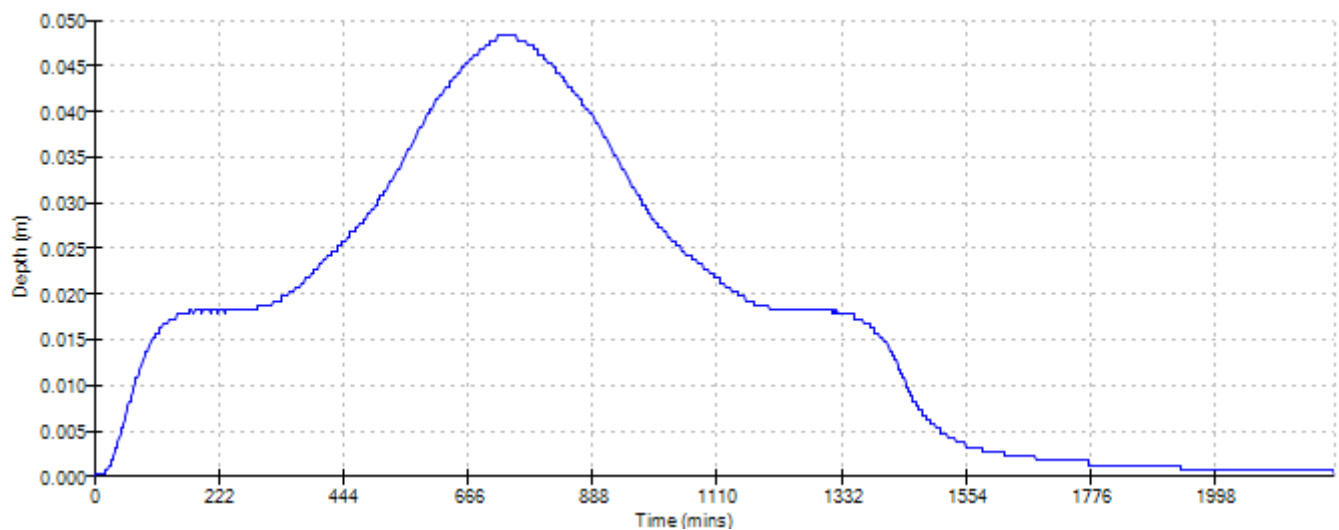
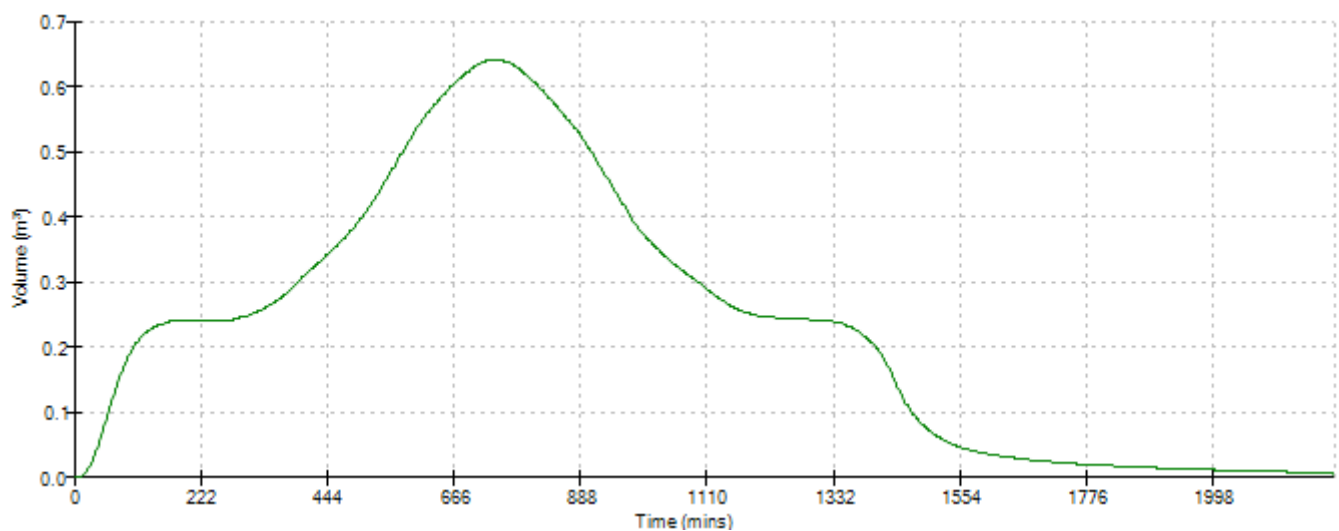
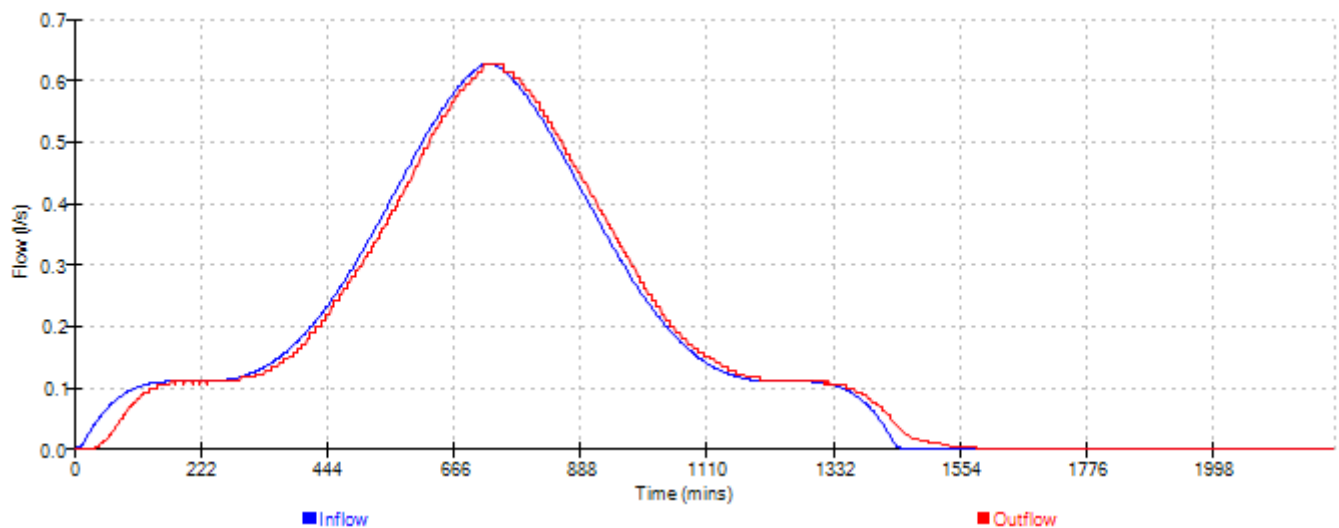
Event: 720 min Winter



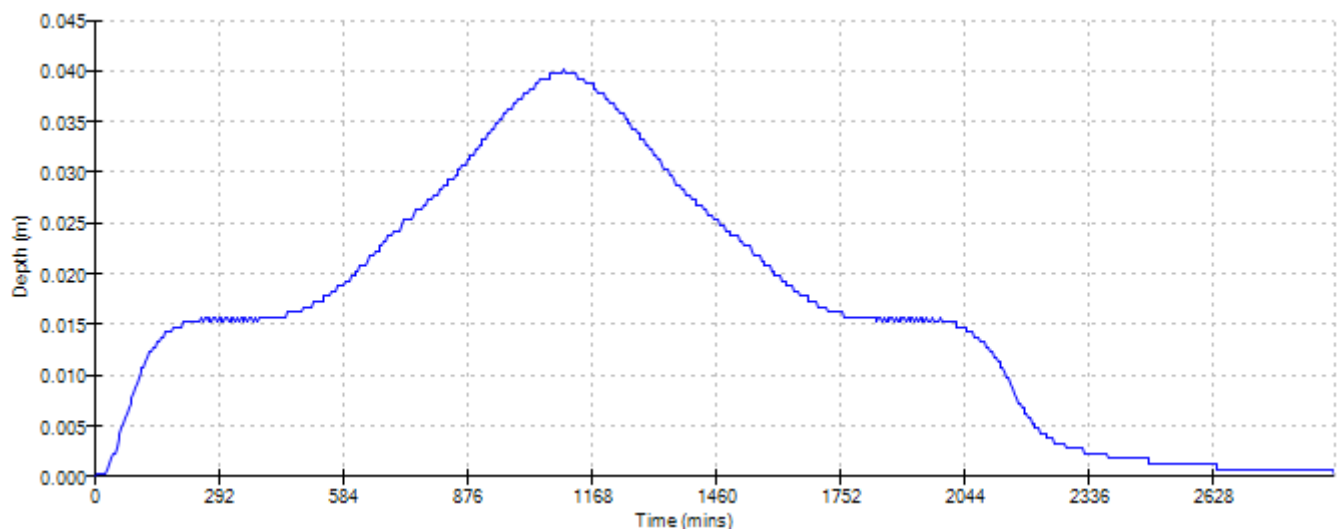
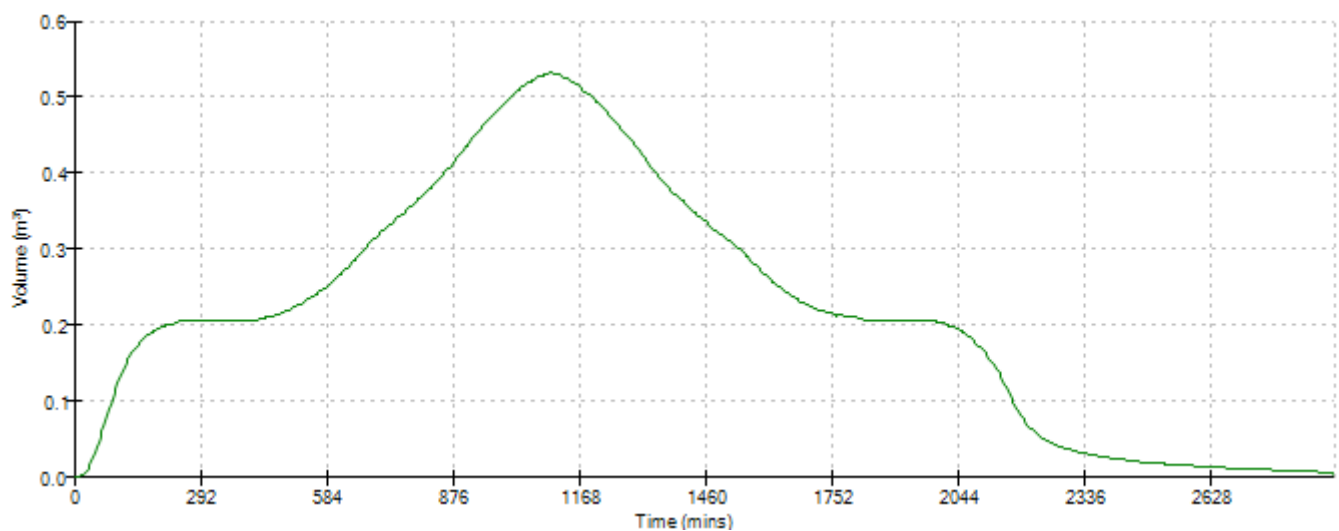
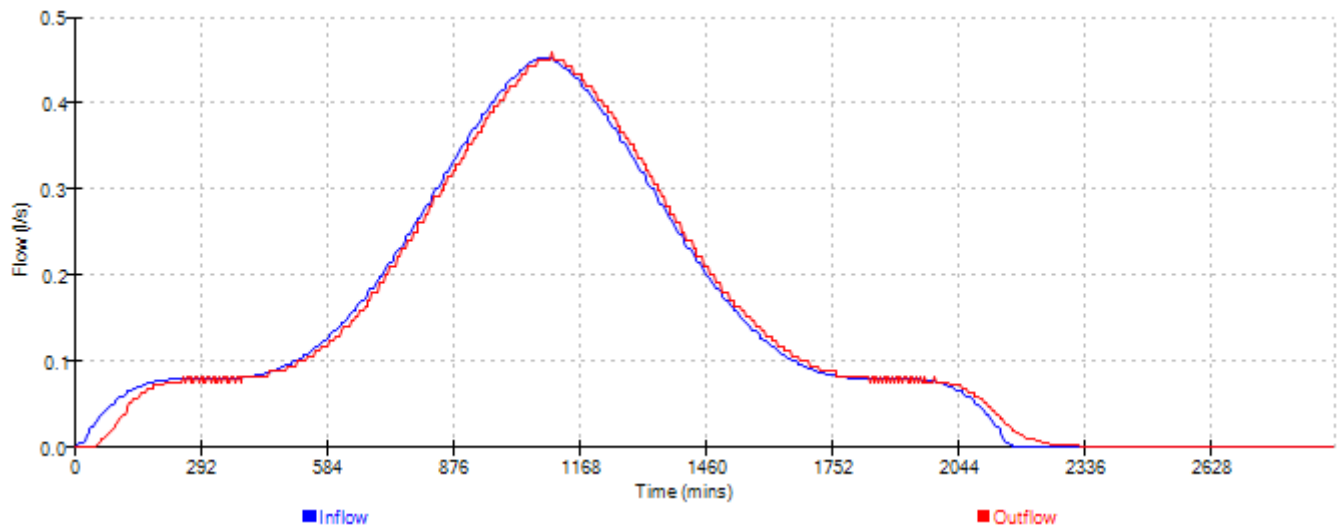
Event: 960 min Winter



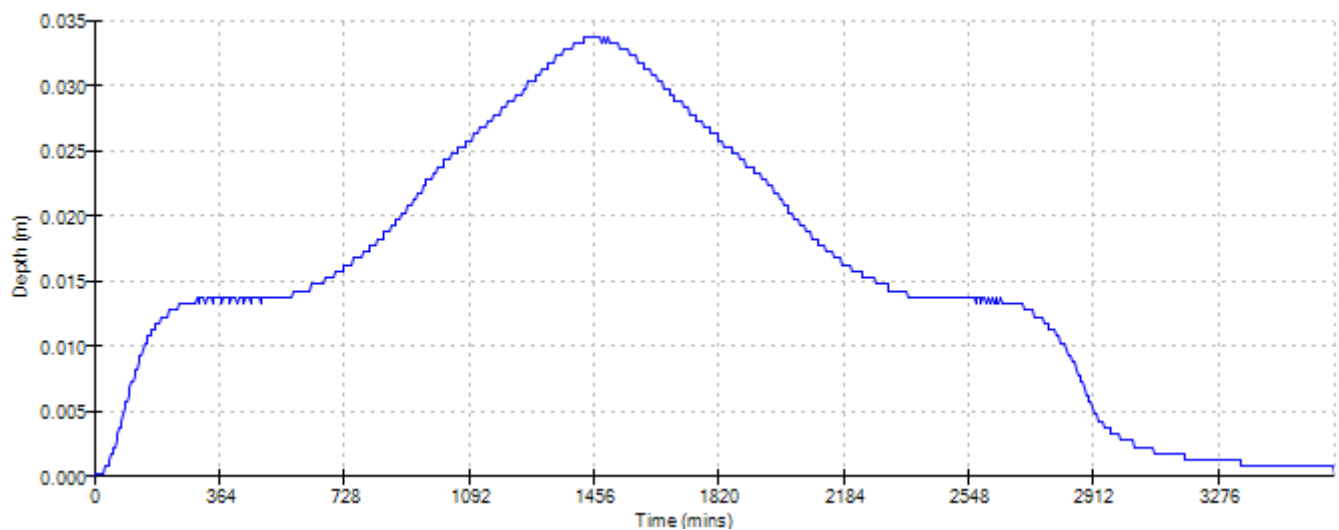
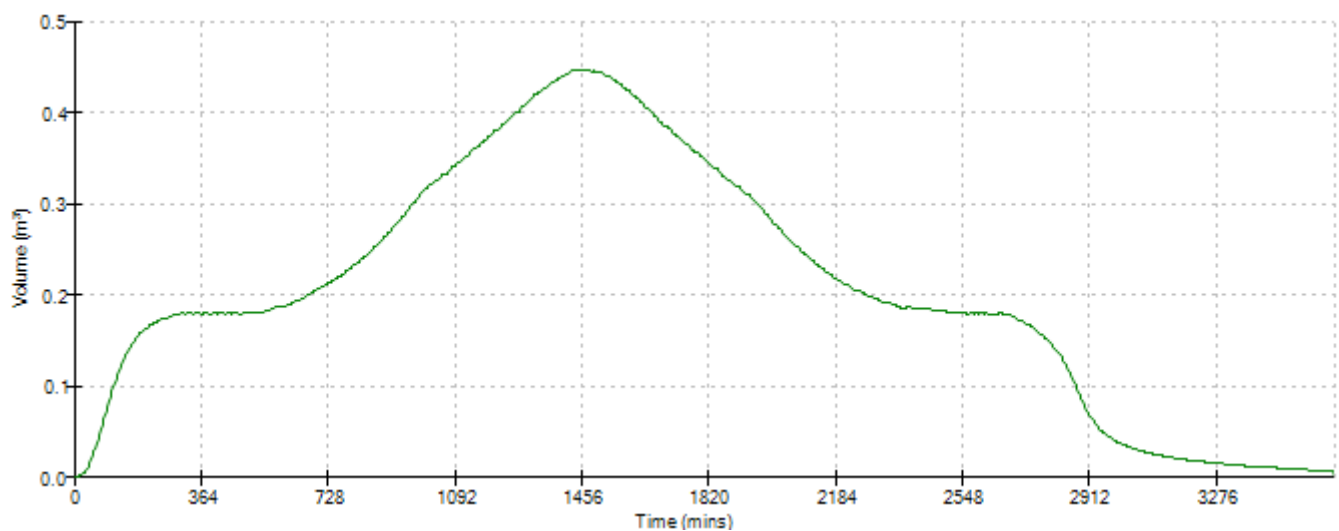
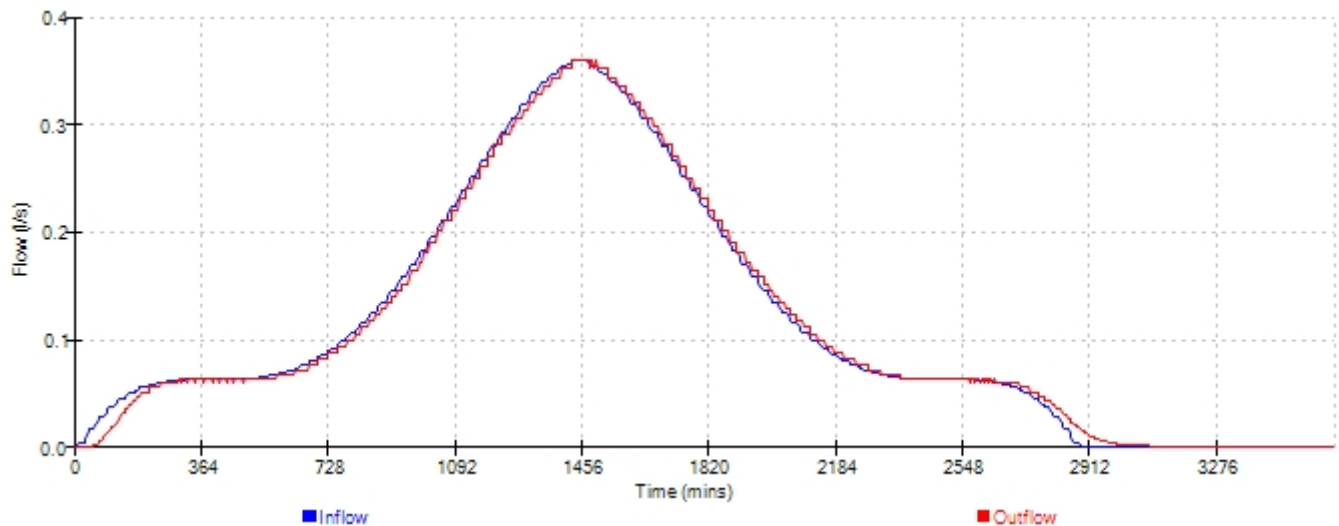
Event: 1440 min Winter



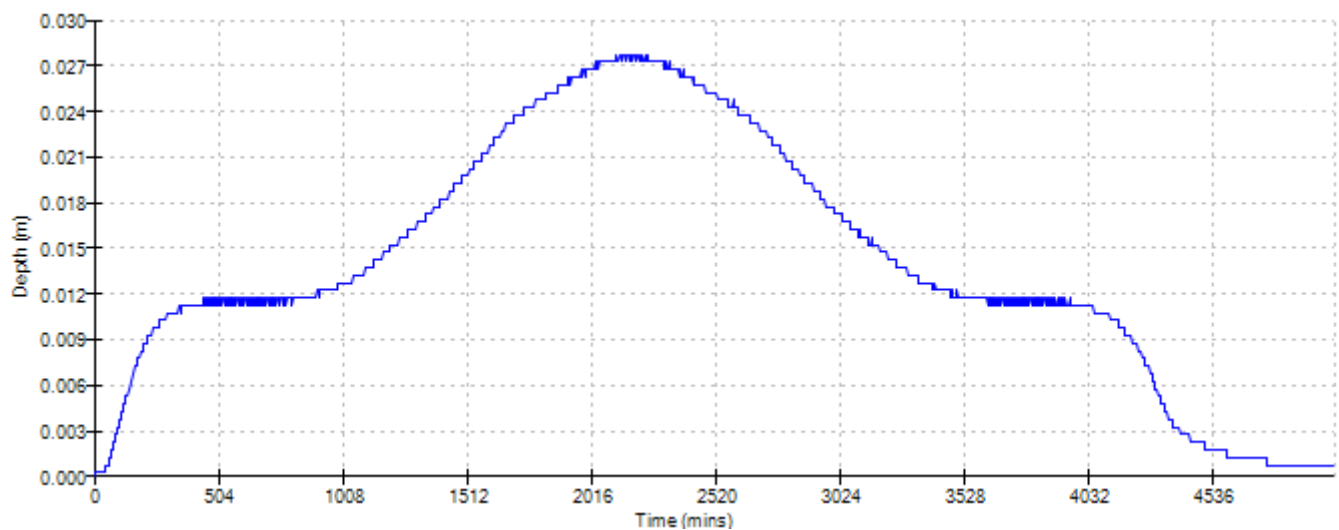
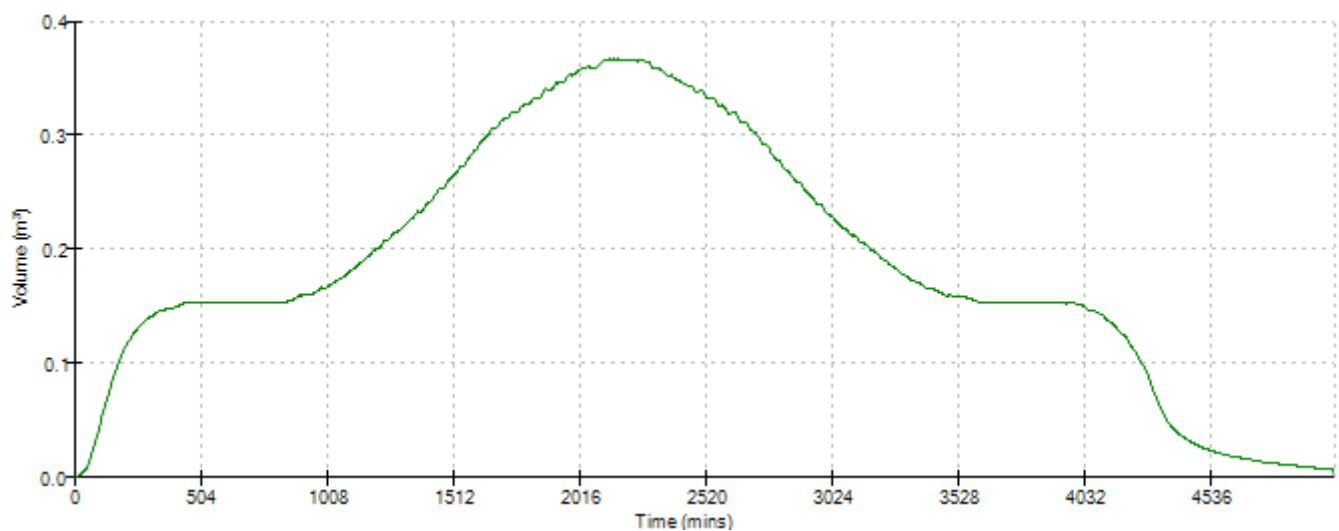
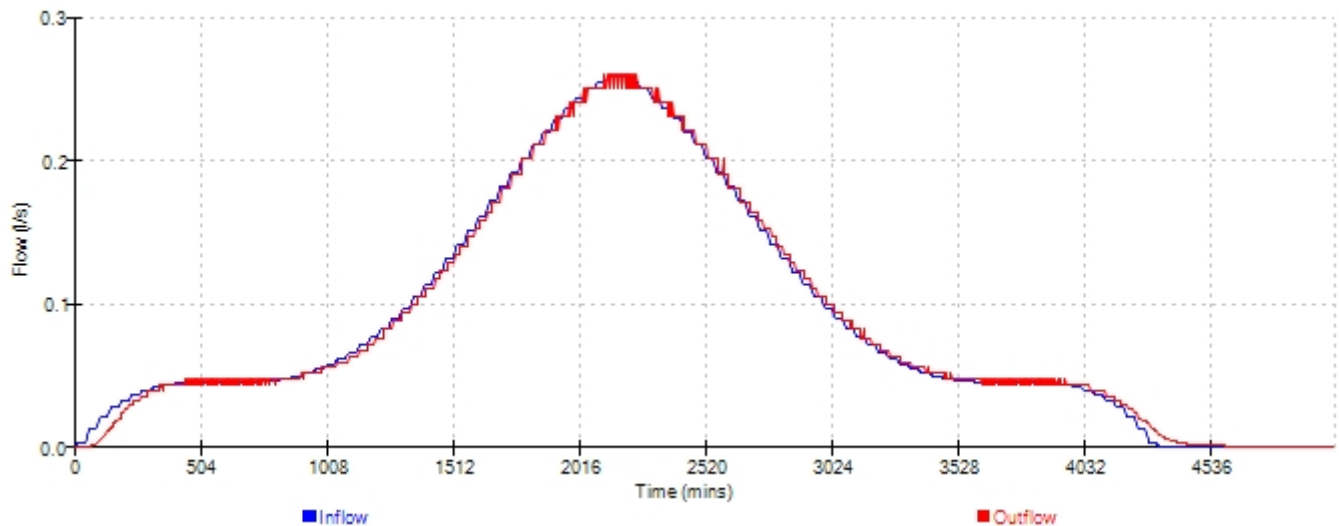
Event: 2160 min Winter



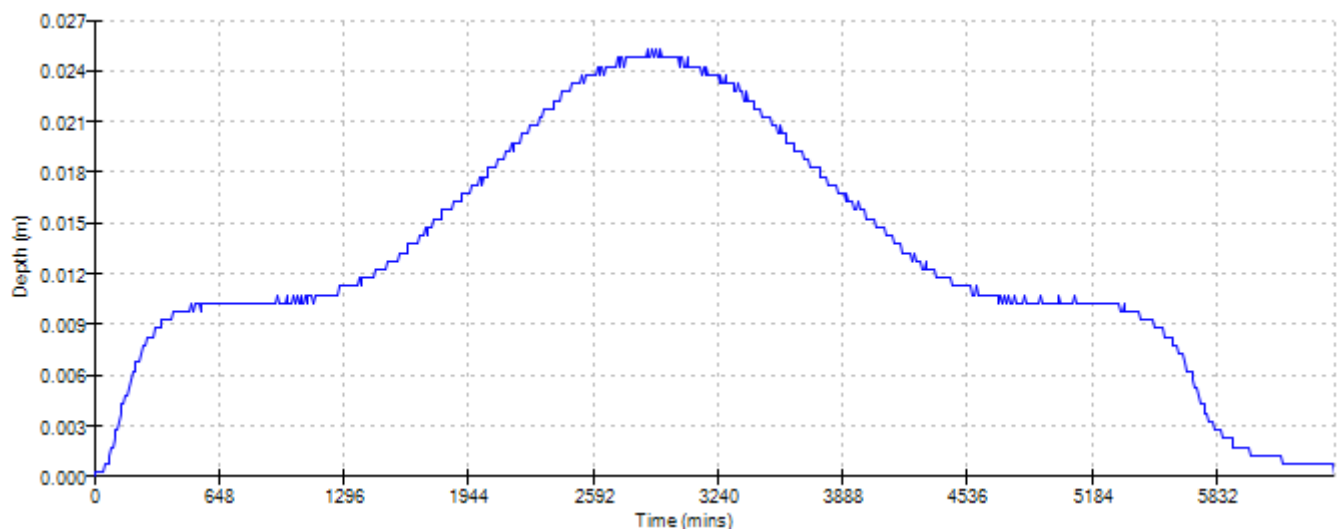
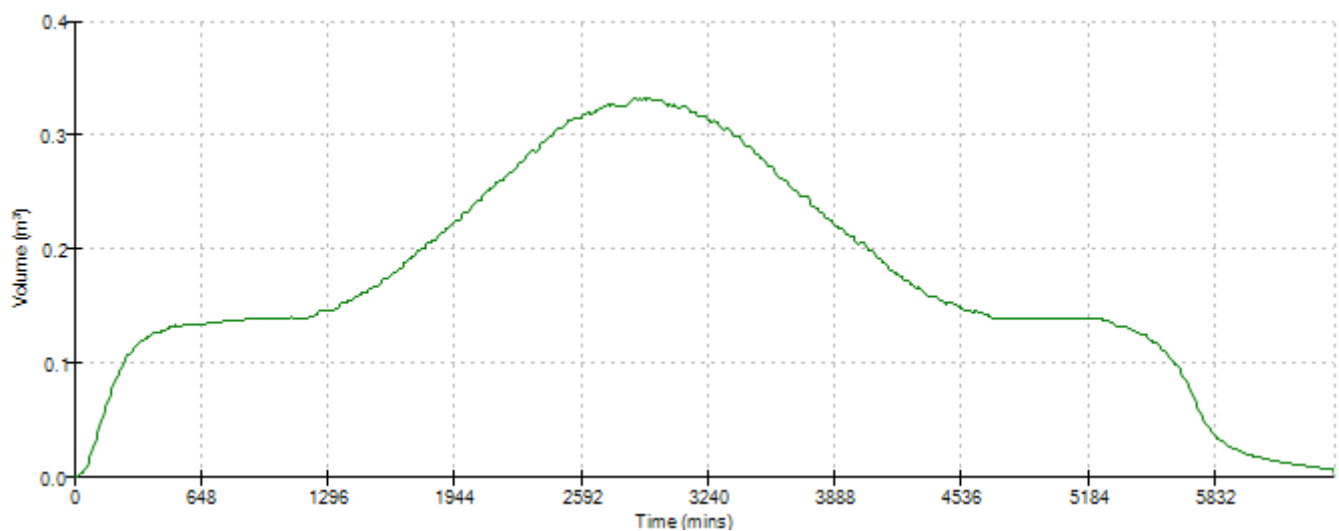
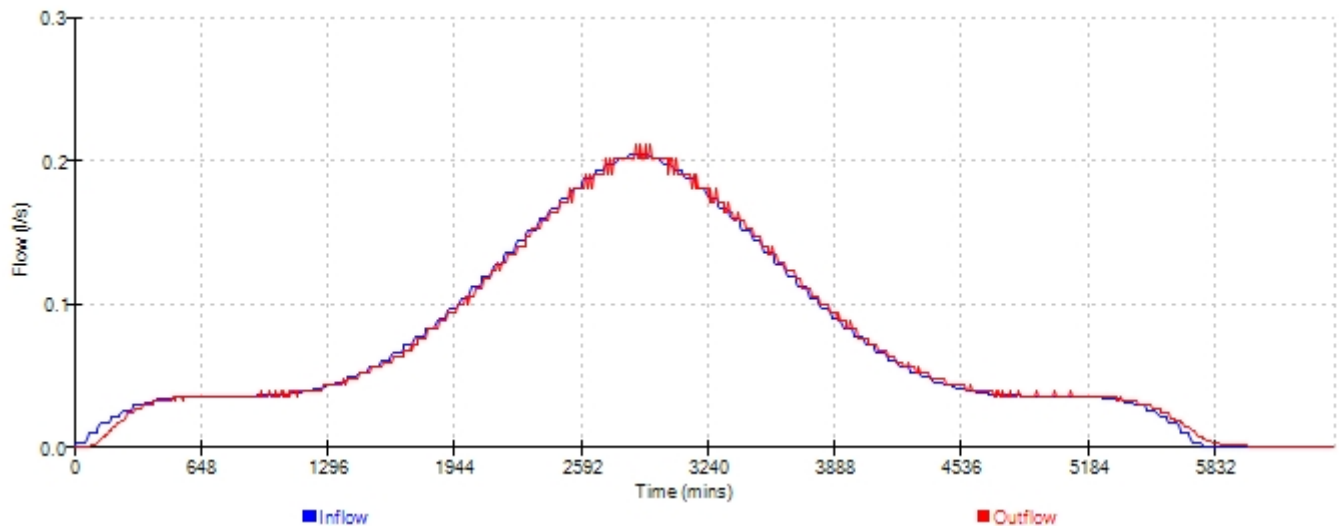
Event: 2880 min Winter



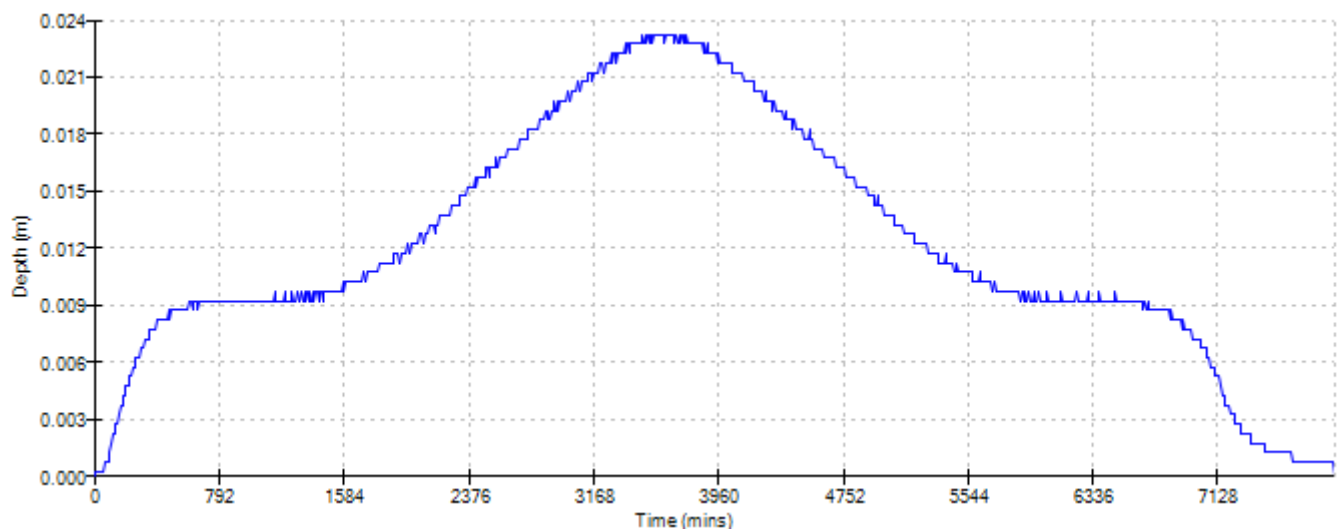
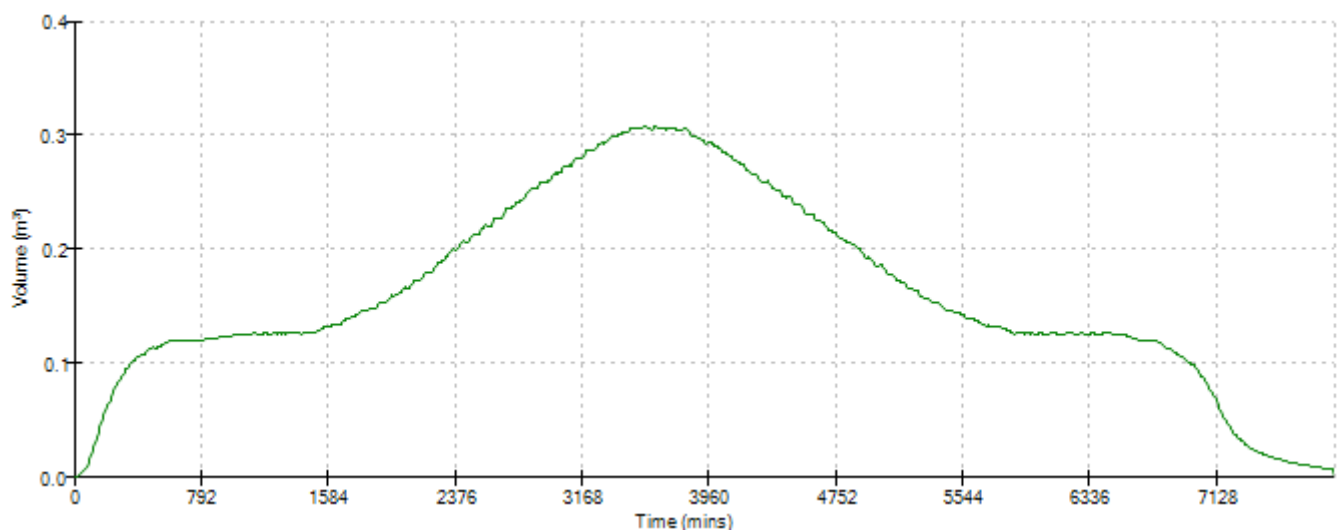
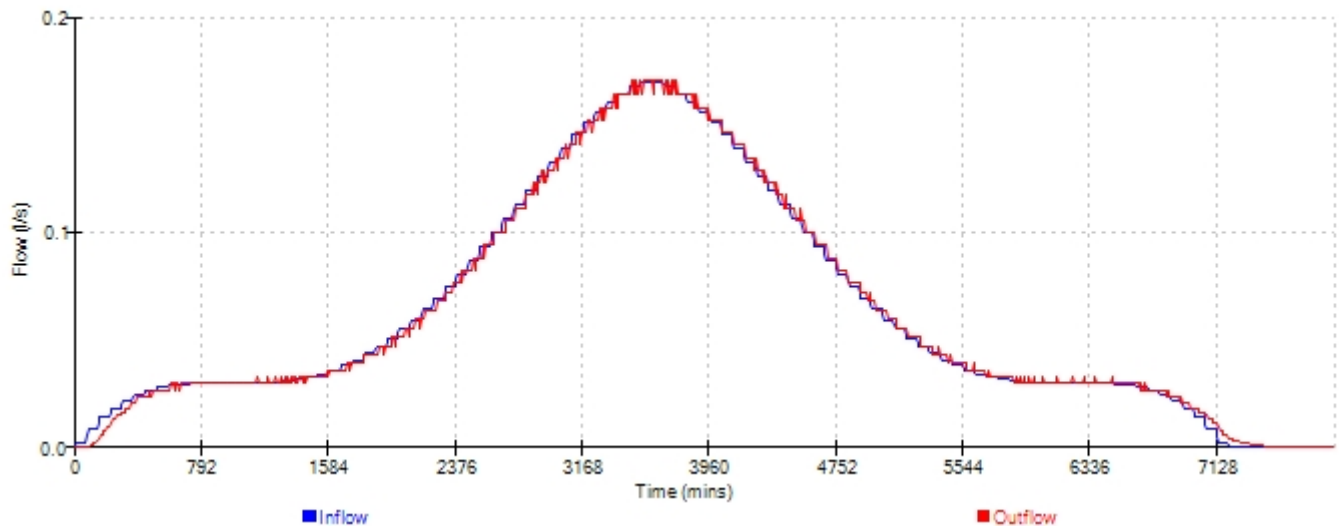
Event: 4320 min Winter



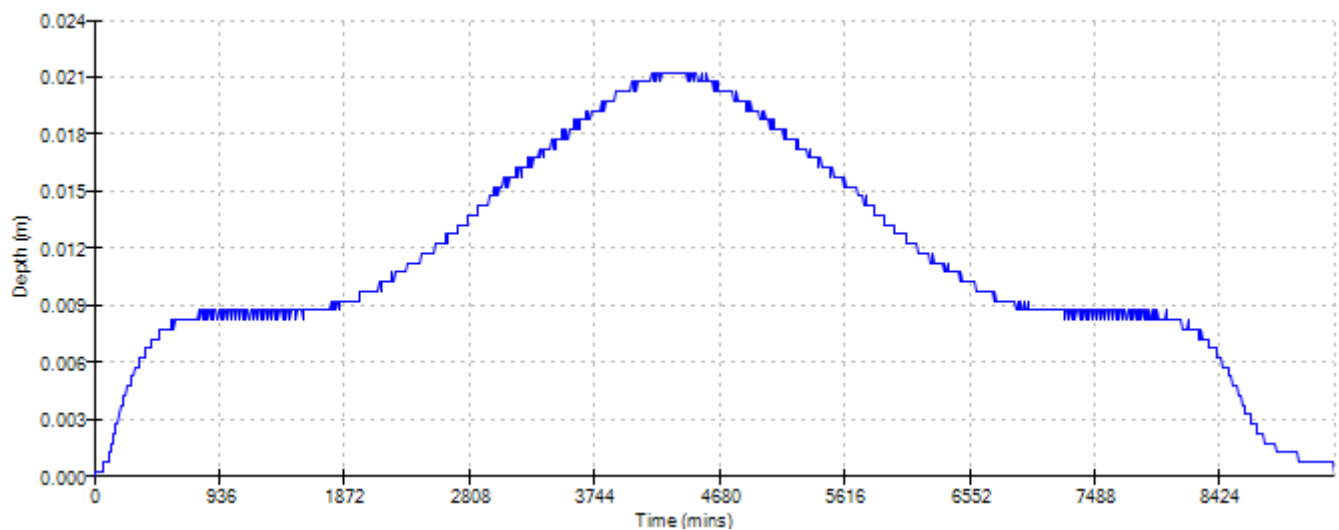
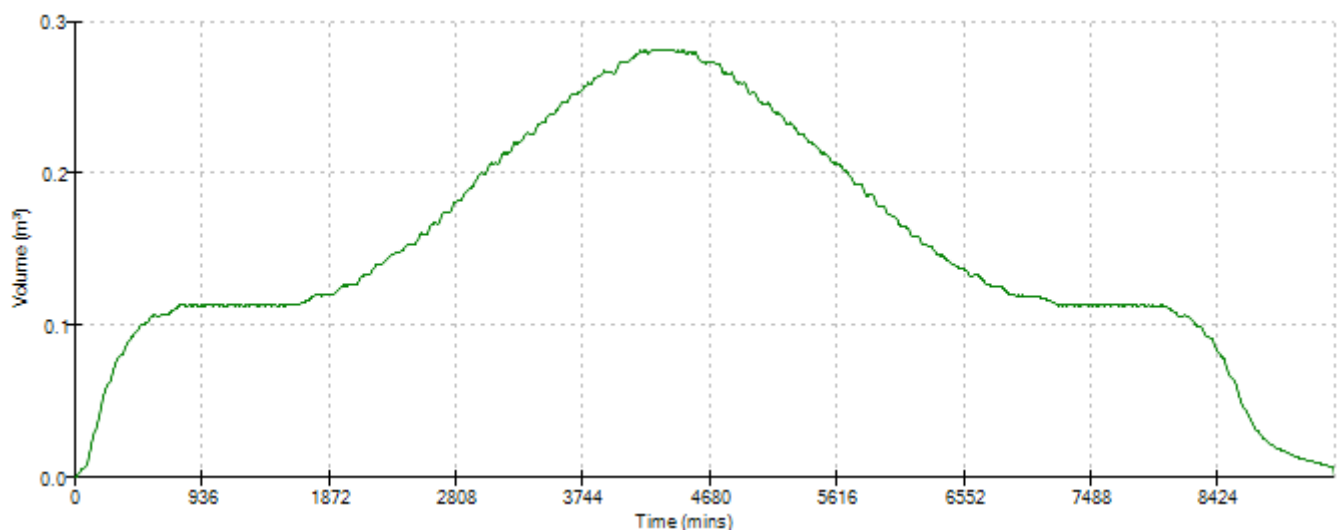
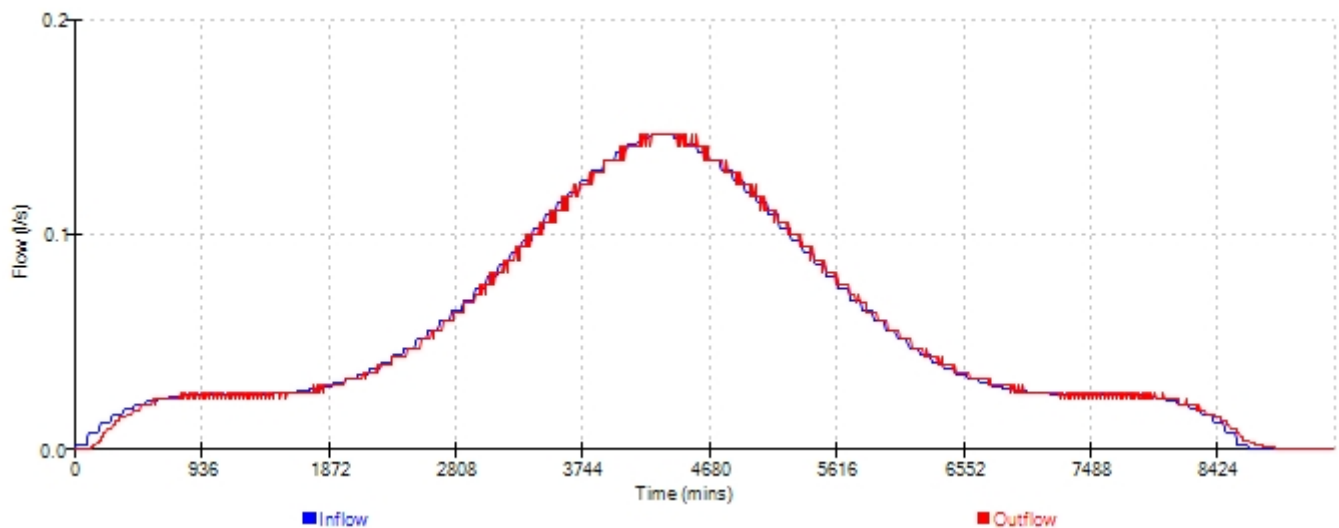
Event: 5760 min Winter



Event: 7200 min Winter



Event: 8640 min Winter



Event: 10080 min Winter

