


Project	Date: 25/09/2024			
	Designed by AlexanderRea	Checked by	Approved By	
Report Details Type: Phase Management Storm Phase: Phase	Company Address:			

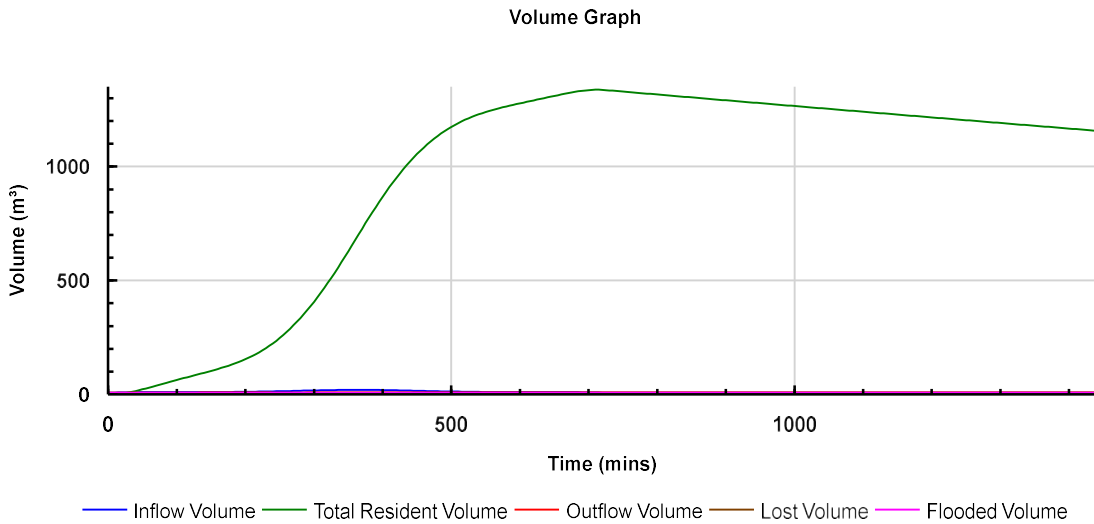
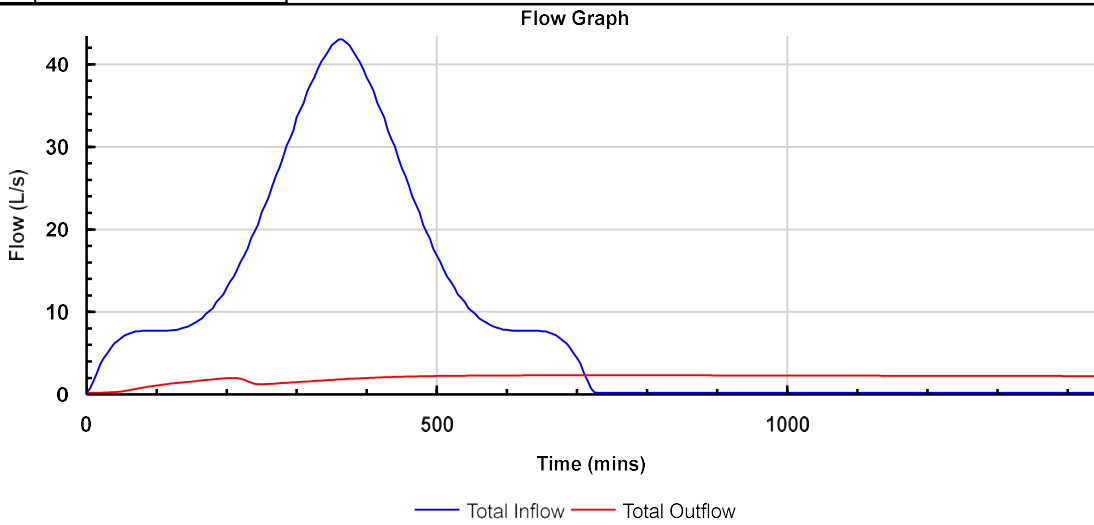


Phase
FEH (1): 100 years: Increase Rainfall (%): +40: 720 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Pond			2.1	156.709
TOTAL	43.0	734.177	2.1	156.709

Graphs



Appendix G – Maintenance Schedules

Water Management Solutions

Klargester

AquaTreat Full Retention GRP Surface Water Treatment Separators

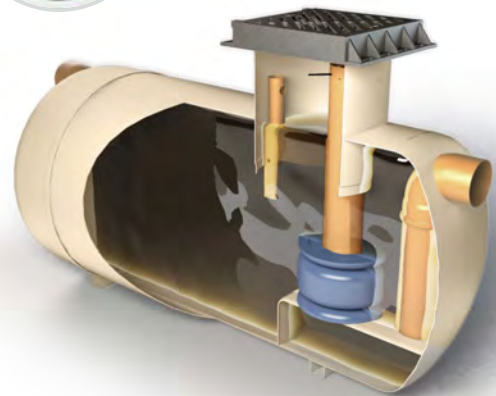
Mitigation Indices

TSS	Metals	Hydrocarbons
0.8%	0.6%	0.9%



Why choose an AquaTreat separator?

- Larger silt storage capacities (compared to vortex separators)
- Our indices cater for high polluted lands (single piece solution)
- Reduced risk of silt build up
- Lesser risk of downstream pollution in SuDS solution due to high capacity silt storage
- Easier servicing, with maintenance from ground level
- SmartServ Pro remote monitoring solution (available as optional extra)



Our range has been tested against full flow

Our units have been tested at their maximum flow rate (10l/s), unlike some products which have been tested based on bypass and therefore only 10% of the flow. This ensures total accuracy of our silt retention results, by replicating the full effect of the silt wash through.

As part of our Planet Passionate programme, Kingspan are dedicated to delivering innovative surface water management technologies, developed on the back of 65 years' experience.

*Terms and conditions apply. View online at <https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms>



Klargester AquaTreat

Full Retention GRP Surface Water Treatment Separators

Technical Specifications

Model	10 l/s Low Risk		6 l/s Medium Risk			
	Treated Flowrate [l/s]	Connectable Surface Area [m ²]	Treated Flowrate [l/s]	Connectable Surface Area [m ²]	Length (mm)	Diameter (mm)
SWT001	10	1333	6	800	2610	1225
SWT002	15	2004	9	1202	3910	1225
SWT003	19	2535	11	1524	3230	2010
SWT004	23	3105	14	1863	3960	2010
SWT005	28	3747	17	2248	4750	2010
SWT006	34	4563	21	2738	5970	2010
SWT007	44	5814	26	3489	7365	2010
SWT008	48	6368	29	3821	5744	2820
SWT009	52	6880	31	4128	6200	2820
SWT010	61	8177	37	4906	7365	2820
SWT011	72	9635	43	5781	8675	2820
SWT012	83	11082	50	6649	9975	2820
SWT013	94	12535	56	7521	11280	2820
SWT014	100	13362	60	8017	11994	2820
SWT015	106	14183	64	8510	12766	2820
SWT016	113	15029	68	9017	13528	2820
SWT017	119	15897	72	9538	14300	2820
SWT018	126	16754	75	10053	15071	2820
SWT019	132	17601	79	10560	15833	2820

Low		
CoP at 10 l/s	% Removal	Mitigation Index
Total Suspended Solids (TSS)	75.6%	0.7
Metals*	57%	0.5
Hydrocarbons	99.6%	0.9
* Reduction of heavy metals by collecting and retaining suspended solids is assumed as 7.5%		

Medium		
CoP at 6 l/s	% Removal	Mitigation Index
Total Suspended Solids (TSS)	81.8%	0.8
Metals*	61.4%	0.6
Hydrocarbons	99.6%	0.9
* Reduction of heavy metals by collecting and retaining suspended solids is assumed as 7.5%		

For more information on any of our products: T: +44 (0)1296 633 033
 E: accivilsales@kingspan.com or visit kingspan.co.uk/klargester

We take every care to ensure that the information in this document is accurate at the point of publication. Dimensions may vary (within a small parameter) due to manufacturing process variations or environmental conditions. All images are for illustration purposes only and, along with dimensions, should not be taken as binding. The actual product may vary and aspects such as equipment specification/colour may differ. To ensure you are viewing the most recent and accurate product information, please visit this link: <https://www.kingspan.com/gb/en-gb/products/water-management/aquacore-sustainable-urban-drainage-systems-suds/surface-water-treatment-separators>
 ©Kingspan and the Lion Device are Registered Trademarks of the Kingspan Group in the UK, Ireland and other countries. All rights reserved. Registered in Country No.NI017631. Registered Office: 180 Gilford Road, Portadown, Co. Armagh, BT635LF. VAT GB412 5124 03



Water Management Solutions

Klargester

AquaTreat Full Retention GRP Surface Water Treatment Separators

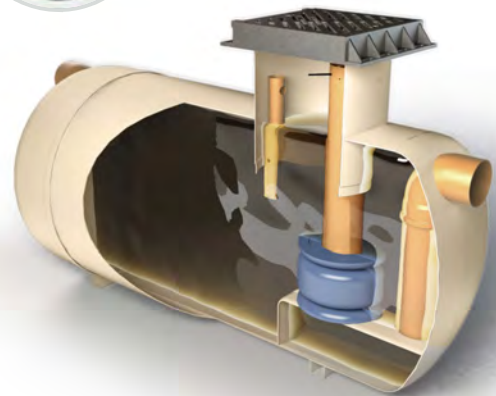
Mitigation Indices

TSS	Metals	Hydrocarbons
0.8%	0.6%	0.9%



Why choose an AquaTreat separator?

- Larger silt storage capacities (compared to vortex separators)
- Our indices cater for high polluted lands (single piece solution)
- Reduced risk of silt build up
- Lesser risk of downstream pollution in SuDS solution due to high capacity silt storage
- Easier servicing, with maintenance from ground level
- SmartServ Pro remote monitoring solution (available as optional extra)



Our range has been tested against full flow

Our units have been tested at their maximum flow rate (10l/s), unlike some products which have been tested based on bypass and therefore only 10% of the flow. This ensures total accuracy of our silt retention results, by replicating the full effect of the silt wash through.

As part of our Planet Passionate programme, Kingspan are dedicated to delivering innovative surface water management technologies, developed on the back of 65 years' experience.

*Terms and conditions apply. View online at <https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms>



Klargester AquaTreat

Full Retention GRP Surface Water Treatment Separators

Technical Specifications

Model	10 l/s Low Risk		6 l/s Medium Risk			
	Treated Flowrate [l/s]	Connectable Surface Area [m ²]	Treated Flowrate [l/s]	Connectable Surface Area [m ²]	Length (mm)	Diameter (mm)
SWT001	10	1333	6	800	2610	1225
SWT002	15	2004	9	1202	3910	1225
SWT003	19	2535	11	1524	3230	2010
SWT004	23	3105	14	1863	3960	2010
SWT005	28	3747	17	2248	4750	2010
SWT006	34	4563	21	2738	5970	2010
SWT007	44	5814	26	3489	7365	2010
SWT008	48	6368	29	3821	5744	2820
SWT009	52	6880	31	4128	6200	2820
SWT010	61	8177	37	4906	7365	2820
SWT011	72	9635	43	5781	8675	2820
SWT012	83	11082	50	6649	9975	2820
SWT013	94	12535	56	7521	11280	2820
SWT014	100	13362	60	8017	11994	2820
SWT015	106	14183	64	8510	12766	2820
SWT016	113	15029	68	9017	13528	2820
SWT017	119	15897	72	9538	14300	2820
SWT018	126	16754	75	10053	15071	2820
SWT019	132	17601	79	10560	15833	2820

Low		
CoP at 10 l/s	% Removal	Mitigation Index
Total Suspended Solids (TSS)	75.6%	0.7
Metals*	57%	0.5
Hydrocarbons	99.6%	0.9
* Reduction of heavy metals by collecting and retaining suspended solids is assumed as 7.5%		

Medium		
CoP at 6 l/s	% Removal	Mitigation Index
Total Suspended Solids (TSS)	81.8%	0.8
Metals*	61.4%	0.6
Hydrocarbons	99.6%	0.9
* Reduction of heavy metals by collecting and retaining suspended solids is assumed as 7.5%		

For more information on any of our products: T: +44 (0)1296 633 033
 E: accivilsales@kingspan.com or visit kingspan.co.uk/klargester

We take every care to ensure that the information in this document is accurate at the point of publication. Dimensions may vary (within a small parameter) due to manufacturing process variations or environmental conditions. All images are for illustration purposes only and, along with dimensions, should not be taken as binding. The actual product may vary and aspects such as equipment specification/colour may differ. To ensure you are viewing the most recent and accurate product information, please visit this link: <https://www.kingspan.com/gb/en-gb/products/water-management/aquacore-sustainable-urban-drainage-systems-suds/surface-water-treatment-separators>
 ©Kingspan and the Lion Device are Registered Trademarks of the Kingspan Group in the UK, Ireland and other countries. All rights reserved. Registered in Country No.NI017631. Registered Office: 180 Gilford Road, Portadown, Co. Armagh, BT635LF. VAT GB412 5124 03



Wetland and Pond Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass - public areas	Monthly (during growing season), or as required
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage, and / or physical damage.	Monthly
	Inspect water body for signs of poor water quality	Monthly (May - October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
	Check any mechanical devices e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Remove sediment from any forebay	Every 1 - 5 years, or as required
Occasional maintenance	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate of Inlets, outlets and overflows	As required

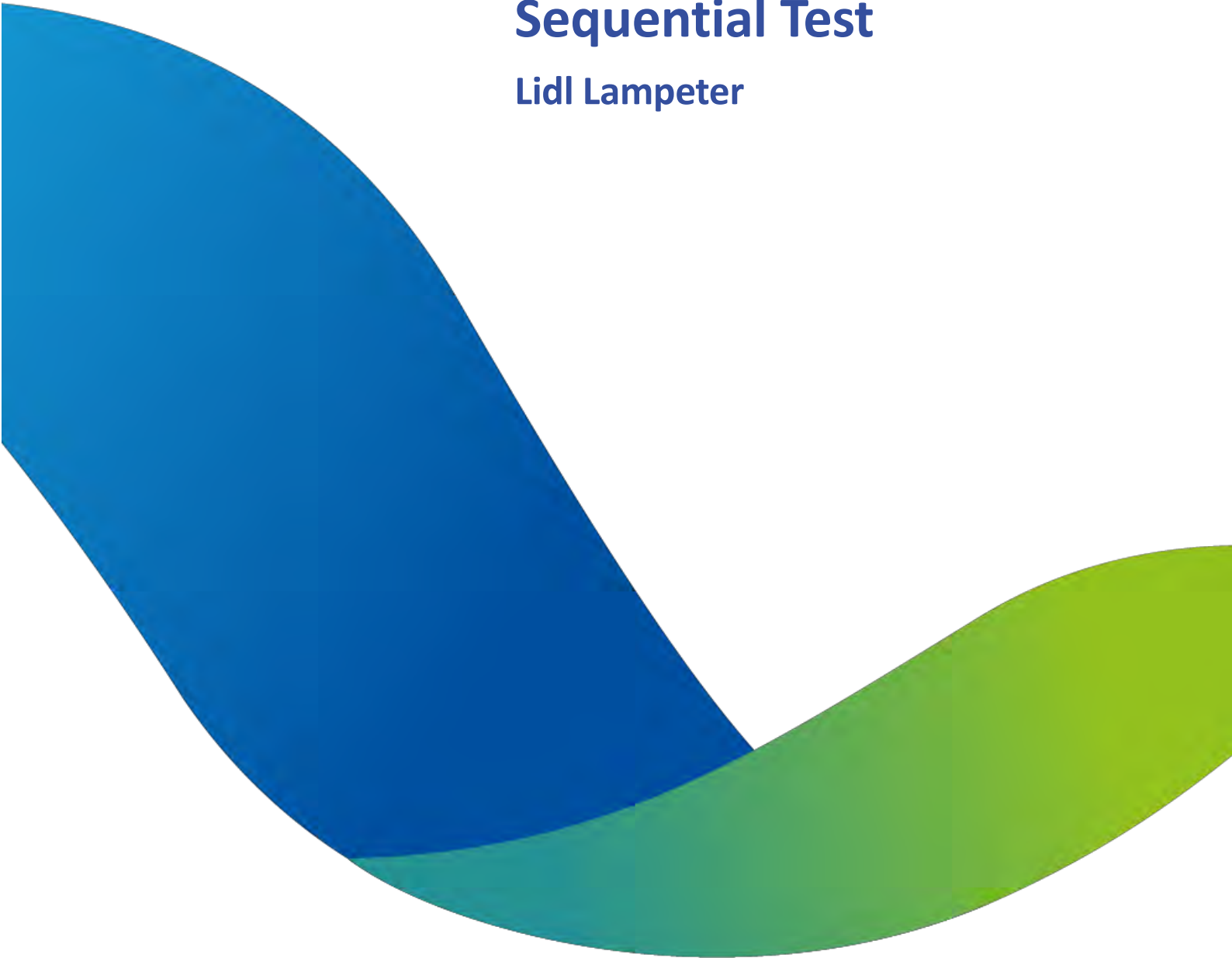
Ref. Table 23.1 CIRIA C753 'The SuDS Manual'

Appendix I



Sequential Test

Lidl Lampeter



Land off Cwmann Terrace, Cwmann, Lampeter SA48 8DR
119796.642269

Report Details

Client	
Report Title	
Site Address	Land off Cwmann Terrace, Cwmann, Lampeter SA48 8DR
Contract Reference	119796.642269
Lucion Contact	_____

About Us

Land off Cwmann Terrace, Cwmann, Lampeter SA48 8DR
119796.642269

Table of Contents

Appendices

No table of contents entries found.

1.0 Introduction

1.1 Purpose

steered away from Zone C'

new development should be

1.2 Scope

2.0 Approach





2.1 Application Site Flood Zone

2.2 Development Vulnerability

2.3 Methodology

2.4 Search Area

3.0 Site Assessment#

Option	Flood Risk	Review	Discounted/Retained
<p>Application Site</p> <p>Land off Cwmann Terrace, Cwmann, Lampeter SA48 8DR</p>			<p>Retained</p>
<p><i>Ceredigion Car Park (and Open Market), Peterwell Terrace (In Centre)</i></p>			
<p><i>Ceredigion Car Park (Mount Walk (Edge of Centre)</i></p>			
<p><i>Lampeter Town Centre Vacant Units</i></p>			

Land to the South of Pontbraen Road, University of Trinity College playing fields



Llanybydder Centre Vacant Units



Land adjacent to Cross Hands Hotel



The Old Foundry (LDP Allocation T3/11/E1)

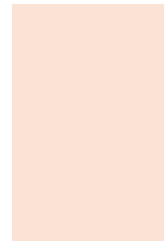


Tregaron Centre Vacant Units



Land to the rear of Talbot Yard, Cylch Caron, Dewi Road, Tregaron (LDP)

Allocation
M0701 and
H0701)



4.0 Conclusions/Recommendations

Appendix J

Luke Bland

From: Flood Risk Analysis South <FRASouth@cyfoethnaturiolcymru.gov.uk>
Sent: 25 September 2024 13:10
To: Nigel West
Subject: RE: Flood modelling at Lampeter using NRW model

Dear Nigel,

Thank you for your question regarding the frequency of flooding on the Teifi floodplain within the Lampeter area. We refer you the following reports which discuss the frequency of flooding. Note that the Co-op Store car park expected flood every 2 to 5 years:

- 2016s4541 Lampeter - FINAL Model User Report v3.0
- 2016s4541 Lampeter Phase 2 - Final Project Report v2.0

If you have any further questions on this please don't hesitate to contact us,

Thanks,

Alastair Papworth

Cynghorydd Dadansoddi Risg Llifogydd / Flood Risk Analysis Advisor

Dadansoddi Risg Llifogydd / Flood Risk Analysis

Yn Ardystiedig o ran Llythrennedd Carbon / Certified Carbon Literate

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.



**Cyfoeth
Naturiol
Cymru**
**Natural
Resources
Wales**

**Byd natur a phobl
yn ffynnu gyda'n gilydd**

**Nature and people
thriving together**



**cyfoethnaturiol.cymru
naturalresources.wales**

From: Nigel West <nigel@herringtonconsulting.co.uk>
Sent: Wednesday, September 25, 2024 8:55 AM
To: Flood Risk Analysis South <FRASouth@cyfoethnaturiolcymru.gov.uk>
Subject: RE: Flood modelling at Lampeter using NRW model

You don't often get email from nigel@herringtonconsulting.co.uk. [Learn why this is important](#)

Rhybudd: Deilliodd yr e-bost hwn o'r tu allan i'r sefydliad. Peidiwch â chlicio dolenni, atodiadau agored nac sganio codau QR oni bai eich bod yn cydnabod yr anfonwr ac yn gwybod bod y cynnwys yn ddiogel.

Caution: This email originated from outside of the organisation. Do not click links, open attachments or scan QR Codes unless you recognise the sender and know the content is safe.

Morning Alastair,

Over the last couple of weeks we have been working on the model. With the re-runs using the old hydrology (and checking against the original product 6 outputs) the 50%AEP event is very much out of bank and the flood plains are very wet. These also necessitate that the initial conditions are already wetting a significant proportion of the flood plain.

Typically, we wouldn't expect this to be the case and, in the absence of any calibration data, would use this to adjust the model/hydrology anecdotally so that the 50%AEP is either in-channel or only just beginning to exceed the banks.

Can you advise whether such extensive flooding during the 50%AEP is expected for the Afon Teifi at Lampeter please?

Kind regards,

Nigel West BSc MCIWEM

Principal Numerical Modeller

01227 833 855 | nigel@herringtonconsulting.co.uk



From: Flood Risk Analysis South <FRASouth@cyfoethnaturiolcymru.gov.uk>

Sent: 13 September 2024 07:32

To: Nigel West <nigel@herringtonconsulting.co.uk>

Subject: RE: Flood modelling at Lampeter using NRW model

Good Morning Nigel,

[We have added comments in blue below.](#)

On the point about bridges, the model has several BB and BBW units for which the form loss is already set to 0.005. Hopefully this is documented in the P5 already; although I have no justification to alter any of these going forwards. – [NRW recommend the default value, unless justification is provided, we believe value 0.005 was used prior to TUFLOW advising on default value of 0.001 to be used.](#)

We will review the hydrology as one of the first things to do. – [you may wish to ask NRW Hydrology team to review the initial flow estimation/hydrographs, this will incur a fee.](#)

In addition to the below, I intend to do the following also:

- Convert the MIF (MapInfo) type environment to SHP (GIS) in line with TUFLOW latest recommendations and to be able to leverage the modern results grid files compression and projection accuracy. – [Note both MIF and Shp files are considered suitable for model build/update. We note TUFLOW tools has an option to convert MIF to shp format. Note that auto conversion tools may introduce errors and it is for the modeller to ensure these have worked correctly.](#)

- Convert the model from 'classic' to HPC/GPU; noting that the original model required 30 hours to run only the initial conditions I suspect that this will be essential to make the runtimes manageable as this will otherwise severely slow the project programme. As part of this I will verify the HPC model results against the already provided P6 extents etc. Switching to HPC will also ensure that we are using TUFLOWS latest/recommended/preferred viscosity implementation. – *Noted, the modeller may wish to consider if the whole model is required for your project.*
- The model will be refined in detail at the site of interest, which will include the incorporation of the site topographic survey data into the model grid. For this, we take an approach whereby we apply the difference between the topo survey data and the LiDAR to the grid so that we retain the detail of the LiDAR but correct the absolute elevation of the grid to match that of the topo. We find that this works exceptionally well for most situations and will of course review whether its appropriate here. – *Noted, it is for the modeller to ensure this works as intended.*

Do you have any issues with any of the three points above?

NRW understands that during model update there may be discovered other changes that are required, this is for the modeller to consider whether these are completed and to document any reason for amending or not amending the information.

NRW expect a modelling technical note or report, QA documentation and model log to be provided if the model is to be reviewed by NRW.

We hope that helps in your programming your work.

Kind Regards,

Alastair Papworth

Cynghorydd Dadansoddi Risg Llifogydd / Flood Risk Analysis Advisor

Dadansoddi Risg Llifogydd / Flood Risk Analysis

Yn Ardystiedig o ran Llythrennedd Carbon / Certified Carbon Literate

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.



**Cyfoeth
Naturiol
Cymru**
**Natural
Resources
Wales**

**Byd natur a phobl
yn ffynnu gyda'n gilydd**
**Nature and people
thriving together**



**cyfoethnaturiol.cymru
naturalresources.wales**

From: Nigel West <nigel@herringtonconsulting.co.uk>

Sent: Thursday, September 12, 2024 1:20 PM

To: Flood Risk Analysis South <FRASouth@cyfoethnaturiolcymru.gov.uk>

Subject: RE: Flood modelling at Lampeter using NRW model

Rhybudd: Deilliodd yr e-bost hwn o'r tu allan i'r sefydliad. Peidiwch â chlicio dolenni, atodiadau agored nac sganio codau QR oni bai eich bod yn cydnabod yr anfonwr ac yn gwybod bod y cynnwys yn ddiogel.

Caution: This email originated from outside of the organisation. Do not click links, open attachments or scan QR Codes unless you recognise the sender and know the content is safe.

Hi Alastair,

Thank you very much for your swift reply!

Our client has since received the model from your colleague, Michelle Lewis.

I've downloaded and now had a brief chance to review.

I note all your points below, they all sound very sensible.

On the point about bridges, the model has several BB and BBW units for which the form loss is already set to 0.005. Hopefully this is documented in the P5 already; although I have no justification to alter any of these going forwards.

We will review the hydrology as one of the first things to do.

In addition to the below, I intend to do the following also:

- Convert the MIF (MapInfo) type environment to SHP (GIS) in line with TUFLOW latest recommendations and to be able to leverage the modern results grid files compression and projection accuracy.
- Convert the model from 'classic' to HPC/GPU; noting that the original model required 30 hours to run only the initial conditions I suspect that this will be essential to make the runtimes manageable as this will otherwise severely slow the project programme. As part of this I will verify the HPC model results against the already provided P6 extents etc. Switching to HPC will also ensure that we are using TUFLOWs latest/recommended/preferred viscosity implementation.
- The model will be refined in detail at the site of interest, which will include the incorporation of the site topographic survey data into the model grid. For this, we take an approach whereby we apply the difference between the topo survey data and the LiDAR to the grid so that we retain the detail of the LiDAR but correct the absolute elevation of the grid to match that of the topo. We find that this works exceptionally well for most situations and will of course review whether its appropriate here.

Do you have any issues with any of the three points above?

Kind regards,

Nigel West BSc MCIWEM

Principal Numerical Modeller

01227 833 855 | nigel@herringtonconsulting.co.uk



From: Flood Risk Analysis South <FRASouth@cyfoethnaturiolcymru.gov.uk>

Sent: 12 September 2024 11:46

To: Nigel West <nigel@herringtonconsulting.co.uk>

Subject: RE: Flood modelling at Lampeter using NRW model

Good Morning Nigel,

Thank you for contacting NRW.

We will provide some general advice which is below as we do not know your scope from your client. The list below is not exhaustive and intended only as a starting point for you to consider what may need to be done:

- Use the latest version of the software.
- New LIDAR is now available, and it is recommended that this is considered for any model update. It is for you to ensure that the data is suitable for modelling requirement.
- If new LIDAR is used the 1d/2d linkage data will need to be reviewed.
- The Bridge units with the model should be BB unless otherwise specified, note that current recommendation is that the form loss applied is 0.001. This will need to be checked.
- MasterMap® data may need updating.
- Depending on requirements the modeller may wish to reduce the extent that the model covers.
- The hydrology will need to be reviewed and updated.
- Additional survey data may be required if there are specific needs for the project.
- Climate Change allowances will need to be checked.
- If this is Flood Map Challenge further discussion are required.
- If the model outputs are for a planning a Flood Consequences Assessment (FCA) you wish to contact our Development Flood Risk team (DFRSouthPlanning@cyfoethnaturiolcymru.gov.uk).

If you have any further questions, please do not hesitate to get in contact.

Kind regards,

Alastair Papworth

Cynghorydd Dadansoddi Risg Llifogydd / Flood Risk Analysis Advisor

Dadansoddi Risg Llifogydd / Flood Risk Analysis

Yn Ardystiedig o ran Llythrennedd Carbon / Certified Carbon Literate

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.



**Cyfoeth
Naturiol
Cymru
Natural
Resources
Wales**

**Byd natur a phobl
yn ffynnu gyda'n gilydd**

**Nature and people
thriving together**



**cyfoethnaturiol.cymru
naturalresources.wales**

From: Nigel West <nigel@herringtonconsulting.co.uk>
Sent: Tuesday, September 10, 2024 9:25 AM
To: Flood Risk Analysis South <FRASouth@cyfoethnaturiolcymru.gov.uk>
Subject: Flood modelling at Lampeter using NRW model

You don't often get email from nigel@herringtonconsulting.co.uk. [Learn why this is important](#)

Rhybudd: Deilliodd yr e-bost hwn o'r tu allan i'r sefydliad. Peidiwch â chlicio dolenni, atodiadau agored nac sganio codau QR oni bai eich bod yn cydnabod yr anfonwr ac yn gwybod bod y cynnwys yn ddiogel.

Caution: This email originated from outside of the organisation. Do not click links, open attachments or scan QR Codes unless you recognise the sender and know the content is safe.

To whom it may concern,

We have recently been engaged by our client to refine the Lampeter Phase 2 model of 2017 to support a Flood Risk Assessment for a Planning Application for a commercial site near Lampeter. Our client, Lucien Group, have already engaged with you to retrieve the Lampeter model.

Separately, your online modelling guidance suggests that we should be engaging with you directly before we undertake any modelling work.

Can you confirm that this applies equally to the refinement of an existing model please?

Naturally, we would follow your existing online guidance, but also seek your input as part of this consultation so that we can ensure that we supply a model that is to your satisfaction.

Kind regards,

Nigel West BSc MCIWEM

Principal Numerical Modeller

01227 833 855 | nigel@herringtonconsulting.co.uk

herrington
Part of 