

27<sup>th</sup> May 2022

F.A.O. Lancashire County Council  
Harry McGaghey  
Lead Local Flood Authority

Ribble Valley Borough Council  
Council Offices  
Church Walk  
Clitheroe  
Lancashire  
BB7 2RA



## LAND EAST OF CHIPPING LANE, LONGRIDGE

### Planning Reference: 3/2021/1134

Dear Harry,

We have drafted this response to address the comments made by the LLFA (Lancashire County Council) in relation to the difference identified between the greenfield rates of run-off proposed for Phase 1 and Phase 2 & 3 on land to the east of Chipping Lane in Longridge.

In summary it should be understood that the greenfield rates of run off proposed within the Phase 1 Flood Risk Assessment & Drainage Management Strategy (FRA&DMS) and the Phase 2 & 3 FRA&DMS, differ due to the different methodologies used to calculate the greenfield surface water run-off rates.

The FRA&DMS for Phase 1 was undertaken in 2016 and the preferred approach and methodology, during this time to calculate greenfield run-off rates was to use the IH124 method. This method calculated Phase 1 to have a restricted greenfield run-off rate (QBar) of 44.4l/s, which is equivalent to 8.3l/s/ha.

The FRA&DMS for Phase 2 & 3 was however undertaken in 2021, during this time the methodology for calculation greenfield run-off rates for undeveloped greenfield sites was updated to the FEH statistical method. It should be noted that the FEH statistical method is now a widely recognised and more accurate method to use to calculate surface water run-off for greenfield sites discharging to a watercourse.

Furthermore, the greenfield run-off rates calculated within the Phase 2 & 3 FRA&DMS are also based on a specific BFI figure, which was obtained through catchment data (onsite point data) at a specific location onsite. Based on the development area, the pre-development greenfield rate (QBar) for Phase 2 & 3 was therefore calculated to be 84.9l/s (13.6l/s/ha) using the FEH Statistical Method.

Ultimately, given the time difference between undertaking the FRA&DMS for Phase 1 the method for calculating greenfield run-off has changed. For example, if we use the FEH statistical method to calculate the greenfield run-off rate for Phase 1, a discharge rate of 72.8l/s (13.6l/s/ha) is determined (see calculations included). This greenfield run-off rate is the same as the greenfield run-off rate proposed for Phase 2 & 3.

In spite of the previous approval, it is therefore understood that the development site should use the most up to date methodologies to calculate greenfield run-off rates in accordance with policy as the most up to date methodologies provide more accurate and reliable results.

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Old Marsh Farm Barns  
Welsh Road, Sealand  
Flintshire CH5 2LY  
Telephone: 01244 289 041

I hope the above provides clarity on the differences between the surface water discharge rates, should any further information be required please do not hesitate to contact the team.

Yours sincerely



**Megan Berry** BSc (Hons) MCIWEM  
Flood Risk Analyst

*Included.*  
*Surface Water Calculations*

Print

Close Report



# Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

**Site Details**

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

### Site characteristics

Total site area (ha):

### Methodology

$Q_{MED}$  estimation method:

BFI and SPR method:

HOST class:

BFI / BFIHOST:

$Q_{MED}$  (l/s):

$Q_{BAR} / Q_{MED}$  factor:

### Hydrological characteristics

	Default	Edited
SAAR (mm):	<input type="text" value="1211"/>	<input type="text" value="1211"/>
Hydrological region:	<input type="text" value="10"/>	<input type="text" value="10"/>
Growth curve factor 1 year:	<input type="text" value="0.87"/>	<input type="text" value="0.87"/>
Growth curve factor 30 years:	<input type="text" value="1.7"/>	<input type="text" value="1.7"/>
Growth curve factor 100 years:	<input type="text" value="2.08"/>	<input type="text" value="2.08"/>
Growth curve factor 200 years:	<input type="text" value="2.37"/>	<input type="text" value="2.37"/>

### Notes

#### (1) Is $Q_{BAR} < 2.0$ l/s/ha?

When  $Q_{BAR}$  is  $< 2.0$  l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

#### (2) Are flow rates $< 5.0$ l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

#### (3) Is $SPR/SPRHOST \leq 0.3$ ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

### Greenfield runoff rates

	Default	Edited
$Q_{BAR}$ (l/s):	<input type="text"/>	<input type="text" value="72.84"/>
1 in 1 year (l/s):	<input type="text"/>	<input type="text" value="63.37"/>
1 in 30 years (l/s):	<input type="text"/>	<input type="text" value="123.82"/>
1 in 100 year (l/s):	<input type="text"/>	<input type="text" value="151.5"/>
1 in 200 years (l/s):	<input type="text"/>	<input type="text" value="172.62"/>

Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

## Site characteristics

Total site area (ha):

## Methodology

$Q_{MED}$  estimation method:

BFI and SPR method:

HOST class:

BFI / BFIHOST:

$Q_{MED}$  (l/s):

$Q_{BAR} / Q_{MED}$  factor:

## Hydrological characteristics

	Default	Edited
SAAR (mm):	<input type="text" value="1211"/>	<input type="text" value="1211"/>
Hydrological region:	<input type="text" value="10"/>	<input type="text" value="10"/>
Growth curve factor 1 year:	<input type="text" value="0.87"/>	<input type="text" value="0.87"/>
Growth curve factor 30 years:	<input type="text" value="1.7"/>	<input type="text" value="1.7"/>
Growth curve factor 100 years:	<input type="text" value="2.08"/>	<input type="text" value="2.08"/>
Growth curve factor 200 years:	<input type="text" value="2.37"/>	<input type="text" value="2.37"/>

## Notes

### (1) Is $Q_{BAR} < 2.0$ l/s/ha?

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Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

### (3) Is $SPR/SPRHOST \leq 0.3$ ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
$Q_{BAR}$ (l/s):	<input type="text"/>	<input type="text" value="84.85"/>
1 in 1 year (l/s):	<input type="text"/>	<input type="text" value="73.82"/>
1 in 30 years (l/s):	<input type="text"/>	<input type="text" value="144.25"/>
1 in 100 year (l/s):	<input type="text"/>	<input type="text" value="176.49"/>
1 in 200 years (l/s):	<input type="text"/>	<input type="text" value="201.1"/>

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at [www.uksuds.com](http://www.uksuds.com). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [www.uksuds.com/terms-and-conditions.htm](http://www.uksuds.com/terms-and-conditions.htm). The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

**Contact:** Please contact the Local Planning Authority

**Date:** 05 July 2022

Dear Local Planning Authority,

Thank you for inviting the Lead Local Flood Authority to comment on the below application.

### PLANNING APPLICATION CONSULTATION RESPONSE

<b>Application Number:</b>	3/2021/1134
<b>Proposal:</b>	Development of Phases 2 and 3 for the erection of 198 dwellings, including affordable housing and housing for older people, with associated landscaping, SUDS, LEAP, and areas of open space.
<b>Location:</b>	Land East of Chipping Lane, Longridge, Ribble Valley

The Lead Local Flood Authority is a statutory consultee for major developments with surface water drainage, under the Town and Country Planning (Development Management Procedure) (England) Order 2015. It is in this capacity this response is compiled.

Comments provided in this representation, including conditions, are advisory and it is the decision of the Local Planning Authority whether any such recommendations are acted upon. The comments given have been composed based on the extent of the knowledge of the Lead Local Flood Authority and information provided with the application at the time of this response.

#### **Lead Local Flood Authority Position**

The Lead Local Flood Authority wishes to **withdraw its objection** to the above application, which will be acceptable subject to the inclusion of the following condition(s), in consultation with the Lead Local Flood Authority:

## **Conditions**

### **Condition 1 – Development is in accordance with the submitted Flood Risk Assessment**

The development permitted by this planning permission shall be carried out in accordance with the principles set out within the site-specific flood risk assessment (22<sup>nd</sup> November 2021 / HYD371\_Chipping.Lane\_FRA&DMS – Version 2 / Betts Hydro)

The measures shall be fully implemented prior to occupation of the development and in accordance with the timing / phasing arrangements embodied within the scheme, or within any other period as may subsequently be agreed, in writing, by the Local Planning Authority in consultation with the Lead Local Flood Authority.

### **Reason**

To ensure satisfactory sustainable drainage facilities are provided to serve the site in accordance with the Paragraphs 167 and 169 of the National Planning Policy Framework, Planning Practice Guidance and Defra Technical Standards for Sustainable Drainage Systems.

### **Condition 2 – Final Surface Water Sustainable Drainage Strategy to be submitted**

No development shall commence in any phase until a detailed, final surface water sustainable drainage strategy for the site has been submitted to, and approved in writing by, the Local Planning Authority.

The detailed surface water sustainable drainage strategy shall be based upon the site-specific flood risk assessment and indicative surface water sustainable drainage strategy submitted and sustainable drainage principles and requirements set out in the National Planning Policy Framework, Planning Practice Guidance and Defra Technical Standards for Sustainable Drainage Systems. No surface water shall be allowed to discharge to the public foul sewer(s), directly or indirectly.

The details of the drainage strategy to be submitted for approval shall include, as a minimum;

- a) Sustainable drainage calculations for peak flow control and volume control for the:
  - i. 100% (1 in 1-year) annual exceedance probability event;
  - ii. 3.3% (1 in 30-year) annual exceedance probability event
  - iii. 1% (1 in 100-year) annual exceedance probability event + 30% climate change allowance, with an allowance for urban creep

Calculations must be provided for the whole site, including all proposed surface water drainage systems.

- b) Final sustainable drainage plans appropriately labelled to include, as a minimum:

- i. Site plan showing all permeable and impermeable areas that contribute to the drainage network either directly or indirectly, including surface water flows from outside the curtilage as necessary;
  - ii. Sustainable drainage system layout showing all pipe and structure references, dimensions and design levels; to include all proposed surface water drainage systems up to and including the final outfall;
  - iii. Details of all sustainable drainage components, including landscape drawings showing topography and slope gradient as appropriate;
  - iv. Drainage plan showing flood water exceedance routes in accordance with Defra Technical Standards for Sustainable Drainage Systems;
  - v. Finished Floor Levels (FFL) in AOD with adjacent ground levels for all sides of each building and connecting cover levels to confirm minimum 150 mm+ difference for FFL;
  - vi. Details of proposals to collect and mitigate surface water runoff from the development boundary;
  - vii. Measures taken to manage the quality of the surface water runoff to prevent pollution, protect groundwater and surface waters, and delivers suitably clean water to sustainable drainage components;
- c) Evidence of an assessment of the site conditions to include site investigation and test results to confirm infiltrations rates and groundwater levels in accordance with BRE 365.
- d) Evidence of an assessment of the existing on-site watercourse to be used, to confirm that these systems are in sufficient condition and have sufficient capacity to accept surface water runoff generated from the development.
- e) Evidence that a free-flowing outfall can be achieved. If this is not possible, evidence of a surcharged outfall applied to the sustainable drainage calculations will be required.

The sustainable drainage strategy shall be implemented in accordance with the approved details.

### **Reason**

To ensure satisfactory sustainable drainage facilities are provided to serve the site in accordance with the Paragraphs 167 and 169 of the National Planning Policy Framework, Planning Practice Guidance and Defra Technical Standards for Sustainable Drainage Systems.

### **Condition 3 – Construction Surface Water Management Plan**

No development shall commence until a Construction Surface Water Management Plan, detailing how surface water and stormwater will be managed on the site during construction, including demolition and site clearance operations, has been submitted to and approved in writing by the Local Planning Authority.

The details of the plan to be submitted for approval shall include for each phase, as a minimum:

- a) Measures taken to ensure surface water flows are retained on-site during the construction phase(s), including temporary drainage systems, and, if surface water flows are to be discharged, they are done so at a restricted rate that must not exceed the equivalent greenfield runoff rate from the site.
- b) Measures taken to prevent siltation and pollutants from the site into any receiving groundwater and/or surface waters, including watercourses, with reference to published guidance.

The plan shall be implemented and thereafter managed and maintained in accordance with the approved plan for the duration of construction.

### **Reasons**

To ensure the development is served by satisfactory arrangements for the disposal of surface water during each construction phase(s) so it does not pose an undue surface water flood risk on-site or elsewhere during any construction phase in accordance with Paragraph 167 of the National Planning Policy Framework.

### **Condition 4 – Sustainable Drainage System Operation and Maintenance Manual**

The occupation of the development shall not be permitted until a site-specific Operation and Maintenance Manual for the lifetime of the development, pertaining to the surface water drainage system and prepared by a suitably competent person, has been submitted to and approved in writing by the Local Planning Authority.

The details of the manual to be submitted for approval shall include, as a minimum:

- a) A timetable for its implementation;
- b) Details of SuDS components and connecting drainage structures, including watercourses and their ownership, and maintenance, operational and access requirement for each component;
- c) Pro-forma to allow the recording of each inspection and maintenance activity, as well as allowing any faults to be recorded and actions taken to rectify issues;
- d) The arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme in perpetuity;
- e) Details of financial management including arrangements for the replacement of major components at the end of the manufacturer's recommended design life;
- f) Details of whom to contact if pollution is seen in the system or if it is not working correctly; and
- g) Means of access for maintenance and easements.

Thereafter the drainage system shall be retained, managed, and maintained in accordance with the approved details.

### **Reason**

To ensure that surface water flood risks from development to the future users of the land and neighbouring land are minimised, together with those risks to controlled waters, property, and ecological systems, and to ensure that the sustainable drainage



system is subsequently maintained pursuant to the requirements of Paragraph 169 of the National Planning Policy Framework.

### **Condition 5 – Verification Report of Constructed Sustainable Drainage System**

The occupation of the development shall not be permitted until a site-specific verification report, pertaining to the surface water sustainable drainage system, and prepared by a suitably competent person, has been submitted to and approved in writing by the Local Planning Authority.

The verification report must, as a minimum, demonstrate that the surface water sustainable drainage system has been constructed in accordance with the approved drawing(s) (or detail any minor variations) and is fit for purpose. The report shall contain information and evidence, including photographs, of details and locations (including national grid references) of critical drainage infrastructure (including inlets, outlets, and control structures) and full as-built drawings. The scheme shall thereafter be maintained in perpetuity.

#### **Reason**

To ensure that surface water flood risks from development to the future users of the land and neighbouring land are minimised, together with those risks to controlled waters, property, and ecological systems, and to ensure that the development as constructed is compliant with the requirements of Paragraphs 167 and 169 of the National Planning Policy Framework.

#### **Reason for Pre-Commencement Conditions**

Drainage is not only a material consideration but an early and fundamental activity in the ground construction phase of any development and it is likely to be physically inaccessible at a later stage by being buried or built over. It is of concern to all flood risk management authorities that an agreed approach is approved before development commences to avoid putting existing and new communities at risk.

The National Planning Policy Framework considers sustainable drainage systems to be important and states that they should be incorporated unless there is clear evidence that this would be inappropriate and, as such the Lead Local Flood Authority needs to be confident that flood risk is being adequately considered, designed for and that any residual risk is being safely managed. To be able to do this the Lead Local Flood Authority requires an amount of certainty either by upfront detail or secured by way of appropriate planning condition(s).

The proposed pre-commencement condition(s) allows for the principle of development to be granted and full detailed drainage designs to be conditioned for approval via a discharge of condition application which could be more favourable to developers in terms of less delay and less financial outlay early in the process. Non-acceptance of the pre-commencement condition could lead the Lead Local Flood Authority to object to the principle of development until all residual risk issues are safely managed.

The Lead Local Flood Authority asks to be consulted on the details submitted for approval to your authority to discharge these conditions and on any subsequent amendments/alterations.

## **Informative**

### **Informative 01 – Ordinary Watercourse (Land Drainage) Consent**

Under the Land Drainage Act 1991 (as amended by the Flood & Water Management Act 2010), you need consent from the Lead Local Flood Authority if you want to carry out works within the banks of any ordinary watercourse which may alter or impede the flow of water, regardless of whether the watercourse is culverted or not.

- **Consent must be obtained before starting any works on site. It cannot be issued retrospectively.**
- **Sites may be inspected prior to the issuing of consent.**
- **Unconsented works within the Highway or Sustainable Drainage System may prevent adoption.**
- **Applications to culvert an existing open ordinary watercourse will generally be refused.**
- **Enforcement action may be taken against unconsented work.**

For the avoidance of doubt, once planning permission has been obtained it **does not** mean that Ordinary Watercourse Consent will be given. It is strongly advised that you obtain any required consent before or concurrently as you apply for planning permission to avoid delays.

You should contact the Flood Risk Management Team at Lancashire County Council to obtain Ordinary Watercourse Consent. Information on the application process and relevant forms can be found here:

<https://www.lancashire.gov.uk/flooding/drains-and-sewers/alterations-to-a-watercourse/>

### **Lead Local Flood Authority - Site-Specific Advice**

The following advice is provided to inform the applicant and the Local Planning Authority of our expectations at the discharge of conditions stage:

The Lead Local Flood Authority in response to the updated information supplied by the applicant in reference to the higher discharge rates has removed its initial objection to this application. The evidence supplied by the applicant demonstrating the need for a higher rate of discharge is based off more accurate data sets and improved methodologies from when the original application that was submitted for the whole site, which outlined a discharge rate of 8.4l/s/ha, in the original condition. The Lead Local Flood Authority will await the Local Planning Authorities direction upon the next steps in reference to the wording of the original condition.

The submitted drainage layout plan indicates that the applicant intends to construct within 8 metres of the open watercourse. Construction within 8 metres of an open watercourse is not advised as access for maintenance purposes is restricted and it has the potential to pose an undue flood risk to structures should fluvial flooding occur.

It is therefore advised that the applicant modifies the proposed drainage layout plan to ensure that no structures are constructed within 8 metres of the top of the banks of the watercourse.

The applicant has included attenuation basins within their sustainable drainage layout. Detailed designs of these must be submitted as part of the final detailed drainage strategy. Historic records of groundwater levels, or ground investigations, should be checked to ensure that during periods of high groundwater, the storage capacity of the basins is retained and that hydraulic connectivity between the surface water runoff and groundwater is acceptable from a water quality perspective. If a liner is used, there is a risk that the liner may 'float' during periods of high groundwater levels. A seasonally high groundwater table may not always impede the proper functioning of the facility, but it can result in a muddy base that may be considered unattractive if not developed into a permeant water feature.

The Lead Local Flood Authority expect a volumetric runoff coefficient of 1 to be applied when modelling impermeable areas. The assumption of 84% and 0% respectively (which is commonly applied by users of MicroDrainage and other design tools) is not particularly conservative for assessing storage requirements for extreme events, though for sizing drainage pipework it is probably not unreasonable. This approach was justified in a paper in the 1990s based on the original runoff model in the Wallingford Procedure which was issued in 1983. This justification is a misuse of the correlation equation which had been developed, and has since which been rendered obsolete based on the fact that the original equation was shown to under-predict runoff for large rainfall events. This approach is supported by the Design and Construction Guidance and the SuDS Manual.

### **What this response DOES NOT cover**

This response does not cover highway drainage, matters pertaining to highway adoption (s38 Highways Act 1980) and/or off-site highway works (s278 Highways Act 1980). Should the applicant intend to install any sustainable drainage systems under or within close proximity to a public road network (existing or proposed), then they would need to separately discuss the use and suitability of those systems with the relevant highway authority.

The applicant is encouraged to discuss the suitability of any overland flow routes and/or flood water exceedance with the relevant highway authority should they have the potential to impact the public highway network and/or public highway drainage infrastructure (either existing or proposed).

### **Material Changes or Additional Information to this Planning Application**

If there are any material changes to the submitted information or additional information provided after this Lead Local Flood Authority response to the Local Planning Authority which impact surface water, the Local Planning Authority is advised to re-consult the

Lead Local Flood Authority. Please be aware this will be classed as a re-consultation with a full 21-day response time. Re-consultations should be sent to our identified mailbox.

Please send a copy of the decision notice to our identified mailbox.

Yours faithfully,

**Harry McGaghey**

Lead Local Flood Authority