

Our Ref : WA/2006/012454-1/1
Your Ref : MHW/sm/1546/D



ENVIRONMENT
AGENCY

Date : 17 May 2006

Martin Wheeler
WSP
Mounbatten House
Basing View
Basingstoke, Hants
RG21 4HJ

1546/D

22 MAY 2006

CJM

MHW

Dear Martin Wheeler

**Flood Risk Assessment - Proposed Mixed Use Development
Land South West of Bicester**

File Ref:SP52SE/12/1

Thank you for the flood risk assessment (FRA) for the above site, I apologise for the delay in responding to you.

Unfortunately, the Environment Agency are unable to accept the findings of the FRA. The following issues may not be exhaustive therefore we would appreciate a meeting to discuss in more detail the FRA.

There is insufficient detail regarding the modelling undertaken in order to accept the findings that the 100 year and 100 year plus 20% flows stay in bank. Further detail of the method of modelling used should be provided, and blockage scenarios included.

There is reference to the raising of ground levels on the site, in paragraph 17.1.1 although the extent of this is not detailed. There should not be any wholesale raising of ground levels within the 100 year plus 20% extent. Any compensation for loss of flood storage capacity must occur on a level for level volume for volume basis.

There is also reference to the diversion of a watercourse, it is not clear from the drawings whether this is part of the proposed layout. No details have been provided, or principles establishing the way in which any diversion will be undertaken.

Any FRA should establish the principles within which the development layout and detailed design should be constrained. We support the raising of finished floor levels 600mm above the 100 year flood event.

The key on Drawing 1546/FRA/D/002 Rev A is insufficient to allow us to be able to assess the strategy.

There is not adequate consideration of SUDS techniques within this FRA for a site of this

Environment Agency

Red Kite House, Howbery Park, Crowmarsh Gifford, Wallingford, Oxon, OX10 8BD, Tel no:01491 828318, Fax no:01491 828302

size. The surface water strategy should provide guidance on the implementation of SUDS on this site and the specific constraints, in accordance with the management train approach which is fundamental to designing a successful SUDS scheme.

In any surface water strategy there should be clear guidance on techniques appropriate on the particular site, and specific areas within that site.

Although we appreciate that you have designed a drainage system based on the worst case scenario, and therefore has proposed underground storage, insufficient justification of the proposed techniques has been provided. Below ground storage tanks are a less sustainable option when compared with above ground or infiltration techniques and do not offer the water quality, ground water recharge, amenity and wildlife habitat benefits of above ground storage techniques. The Environment Agency will only consider the use of underground storage tanks and a traditional piped system, where it can be fully demonstrated that there is no feasible alternative at a site. Although the FRA makes statements regarding the constraints to surface water design in order to justify the use of a tank system, it provides insufficient information to substantiate these statements, such as the high water table in the north east of the site in Paragraph 6.3.13 and areas contaminated 6.3.12.

If there is to be raising of ground levels in some areas, this may mean that infiltration techniques may be appropriate in areas previously discounted, this possibility should be explored.

To arrange a meeting or discuss these points in further details please contact Vicky Boorman (Development Control Engineer) on 01491 828653.

Yours sincerely

G Parkhouse

GAIL PARKHOUSE
Planning Liaison Officer
gparkhouse@environment-agency.gov.uk



**ENVIRONMENT
AGENCY**

Our Ref : WA/2005/011420-1/1

Your Ref : AW/PL1/24/1/3

Date : 11 August 2005

Rachel Jones
Terence O' Rourke Ltd
Ererdene House
Deansleigh Road
Bournemouth
BH7 7DU

Terence O'Rourke
15 AUG 2005
10 11 23

Dear Sir/Madam

REQUEST FOR SCOPING OPINION - LAND SOUTH WEST OF BICESTER

FILE REF:SP52SE/12/1

Please note: This is a copy of the Environment Agency's response to the Local Planning Authority.

Thank you for consulting the Environment Agency on the above Scoping Opinion, I apologise for the delay in responding to you. We have read through the report and have the following comments under the headings given.

Ground conditions and contamination

6.20 - We endorse the view that there is potential for some contamination for have occurred on the site as a result of its previous use and also the uses of the land surrounding the site. These issues should be fully investigated in the Environmental Statement (ES).

We would further endorse points 6.22 and 6.23.

Hydrology and water quality

6.26 - We would endorse the issues raised here, parts of the site lie within Flood Zone 3 the high risk 1 in 100 year floodplain. Also, whilst the majority of the site is located in Flood Zone 1 which is land outside the floodplain development of this size (190 ha) can generate significant volumes of surface water. The impact and risks posed by this will vary according to the characteristics of both the development and the catchment. In line with PPG25 the ES should include a Flood Risk Assessment (FRA). Groundwater flooding may also be an issue where groundwater levels are high and should also be investigated in the ES. The FRA should therefore fully investigate fluvial flooding for areas located within Flood Zone 3, surface water flooding and groundwater flooding.

6.27 - We are pleased to see that the use of SUDS will be explored in the ES and would encourage you to fully embrace the SUDS approach as a means of disposing surface water

Natural Heritage

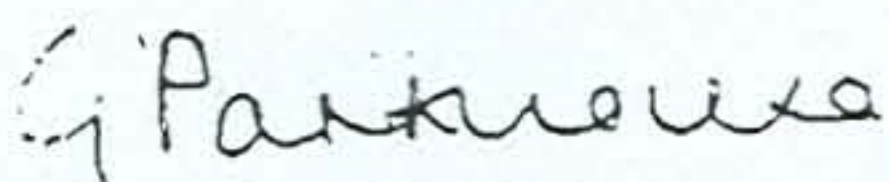
6.40 - Adjacent to the smaller parcel of land to the east of the A41 is a County Wildlife Site known as Promise Land Farm, North Meadow. Whilst this site is not located within the proposed development area, the ES needs to investigate and ensure there will be no detrimental effects to this site as a result of the proposed development.

We would agree that further surveys will be required, including a Phase 1 Habitat survey and a protected species survey. According to our records both water voles and native crayfish have been recorded at the site.

If you wish to discuss this further please contact Pedro Collins (Conservation Officer) 01491 828479.

If you have any other issues please feel free to contact me on 01491 828318.

Yours faithfully



GAIL PARKHOUSE
Planning Liaison Officer
gparkhouse@environment-agency.gov.uk

sustainably and also improving/maintaining water quality.

Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management (SUDS). This approach involves using a range of techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the rate and quantity of surface water run-off from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements. Approved Document Part H of the Building Regulations 2000 sets out a hierarchy for surface water disposal which encourages a SUDS approach.

Further information on SUDS can be found in PPG25 paragraphs 40-42, PPG25 appendix E, in the CIRIA C522 document Sustainable Urban Drainage Systems-design manual for England and Wales and the Interim Code of Practice for Sustainable Drainage Systems. The Interim Code of Practice provides advice on design, adoption and maintenance issues and a full overview of other technical guidance on SUDS. The Interim Code of Practice is available on both the Environment Agency's web site at: www.environment-agency.gov.uk and CIRIA's web site at www.ciria.org.uk

However, whilst SUDS can be successfully used as a sustainable means to dispose of surface water they may have a detrimental impact on the groundwater quality, therefore the ES needs to explore how SUDS can reach a successful outcome without causing any detriment to either factor.

In addition to this the ES should also investigate and seek to confirm that the proposed development would not affect or be affected by groundwater flow, particularly in areas of high groundwater.

6.28 and 6.29 - We would endorse the issues raised in these points.

In addition to the points above we wish to take the opportunity to inform you that whilst we are not aware of any watercourses other than the Pingle Stream and Gagle Brook on the site, should there be any others, we advise that:

- (1) they should not be culverted; and
- (2) a buffer zone is left on either side of any watercourse, and
- (3) culverted watercourses should not be built over, but should ideally be opened up and made a feature of the site.

And, you should note that culverting of a watercourse requires the prior written approval of the local authority under the terms of the Public Health Act 1936, and the prior written consent of the Environment Agency under the terms of the Land Drainage Act 1991/Water Resources Act 1991. The Agency seeks to avoid culverting, and its consent for such works will normally be withheld.

If you wish to discuss the requirements of the FRA please contact Mike Robinson (Development Control Engineer) 01491 828384.

To discuss SUDS please again contact Mike Robinson and also Tom Wickens (Technical Officer - Groundwater and Contaminated Land) 01491 828627.

Steve Hale
WSP
Mountbatten House
Basing View
Basingstoke
Hampshire
RG21 4HJ

WSP GRAHAM DEVELOPMENT	
READING OFFICE	
FILE :	
REF :	
DATE :	17 AUG 2005
CM	<i>[Signature]</i>
SH	

Our ref: SP52SE/12/1
Your ref:
Date: 15 August 2005

Dear Mr Hale

MIXED USE DEVELOPMENT AT LAND SOUTH WEST OF BICESTER

Following our meeting of 21st July 2005, I have now had the opportunity to liase with our Conservation team and can provide the following initial comments on the South West Bicester development proposal.

Fluvial Flooding

The Environment Agency has coarse scale modelling in this area which shows sections of the site to lie within flood zone 3, the high-risk zone for planning purposes.

However, in order to more accurately assess the flood level and extent of the 1 in 100 year and 100 year +20% (increase in flows for climate change) floodplain, a more detailed hydrological study of the area should be undertaken.

Although water is shown to back up along the Pingle Brook from the Langford Brook, the Pingle Brook itself is not currently modelled. The hydraulic assessment should therefore include the upstream influence of the Pingle Brook itself.

Built development should be restricted to the area outside the 1 in 100 year +20% floodplain.

Channel Diversion

Option 2, shown on drawing 1546/SKD05, is the Environment Agency's preferred diversion option, as it keeps channel away from the road to the north.

The hydraulic design of the proposed diversion should be compatible with the existing ditch in terms of cross sectional area and channel length. Where there is a



loss of channel length it must be demonstrated that this will not increase flood risk in the area and ecological mitigation should be provided.

All watercourses on site should be maintained as open channel. You should note that culverting of a watercourse requires the prior written approval of the local authority under the terms of the Public Health Act 1936 and the prior written consent of the Environment Agency under the terms of the Land Drainage Act 1991/ Water Resources Act 1991. The Environment Agency seeks to avoid culverting and its consent for such works will normally be withheld.

The diversion should take the form of a 2-stage channel with a natural form and include meanders and backwaters to maximise the value to habitat. Native planting should be incorporated into the scheme.

Phase 1 habitat surveys for Water Vole and Native White-Clawed Crayfish and protected species surveys will also be required prior to any agreement to the ditch diversion.

Buffer Zone and Ecological Mitigation

An undeveloped buffer zone, of at least 8 metres from the top of bank, should be left on either side of the watercourse to provide continuity of the watercourse corridor habitat.

Ecological mitigation, such as the creation of ponds, scrapes and wetland features, will be required to compensate for the loss of wetland habitat and potential decrease in channel length. Where suitable compensation cannot be provided, the Environment Agency would object to the proposed development. To discuss this in more detail please contact the conservation officer for this area, Pedro Collins, on 01491 828479.

Surface Water Management

As discussed, the surface water drainage strategy should mimic the existing runoff regime as closely as possible.

The applicant should establish the area that currently drains to each of the nearby watercourses and seek to replicate these individual discharge rates in the post-development scheme.

A holistic approach towards surface water is required to provide water quality and water quantity control, as well as increased amenity value. The increased flows and pollution from surface water should be controlled through systems which utilise a management train approach (as described in CIRIA C522 Sustainable Urban Drainage Systems Design Manual for England and Wales) and should achieve equal standing in both of these areas.

The developer will be required to accommodate excess water and control its release into watercourses according to the following criteria:

- The drainage system must be designed to control runoff up to a 1 in 100 year storm event;
- The rate at which surface water is discharged from the site may vary with the severity of the storm event but must not exceed the greenfield runoff rate for a given storm event;

- Excess surface water runoff must be stored on site and released to receiving watercourses at greenfield rates;
- Surface water discharges to watercourses must not exceed a velocity of 1 m/s.

As described in the Interim Code of Practice for Sustainable Drainage Systems and CIRIA C522 manual, SUDS should be used to mimic the natural pattern of drainage. The management train incorporates a hierarchy of techniques which should be used in SUDS selection:

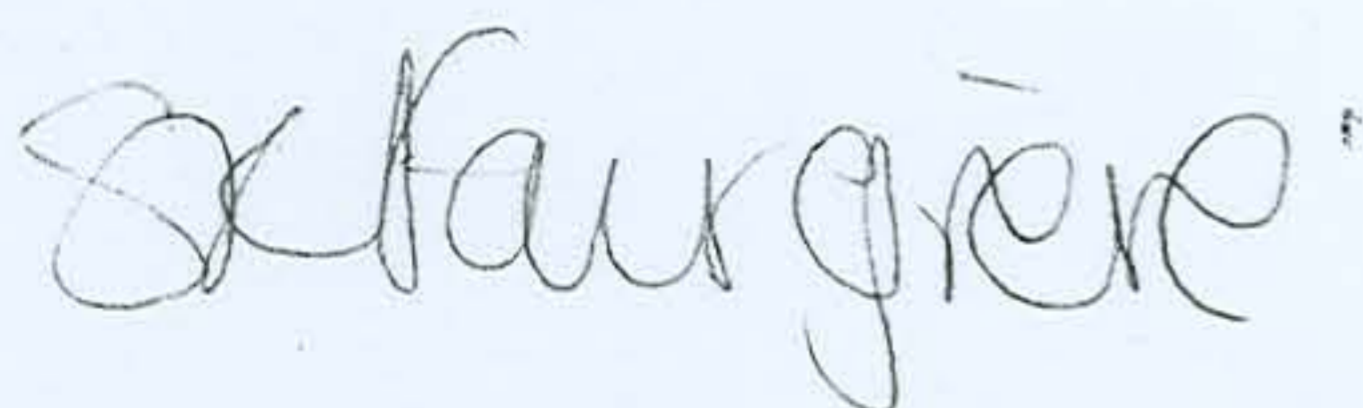
1. **Source control:** attenuate and remove pollutants from runoff close to the source. Simple measures which can be used in high density sites include directing roof, driveway and footpath runoff over grassed areas, or promoting sheetflow through grassed areas. Gravelled or porous car parking areas, roadside swales, filter strips, bioretention devices and filter drains.
2. **Site Controls:** These are runoff and treatment controls that serve areas of approx 2 to 5 ha. The most common forms are swales, extended detention, detention basins (some can take the form of sports pitches) which all have relatively low land take.
3. **Regional Control:** Serve multi-hectare drainage areas greater than 5ha and can be incorporated into public open space. These include extended detention basins, retention ponds and stormwater wetlands. When source and site controls are used upstream, the size of the regional controls can be reduced, freeing additional land for other purposes.

The Environment Agency is please to see the use of balancing ponds proposed at the site. However, on-line storage ponds are not acceptable to the Environment Agency and these should be amended to be off-line to the main channel. In line with the SUDS management train, the applicant should also incorporate source control measures wherever possible, prior to discharging to the site-wide balancing ponds.

SUDs features on the site, such as the balancing ponds, should be designed so as to maximise the benefit to wildlife. This should include variation in the depth of slopes of the balancing pond, with shallow margins (particularly on the south facing slopes) and the use of native planting

Please contact me if you require any further information, otherwise I look forward to receiving further details of scheme as the project progresses.

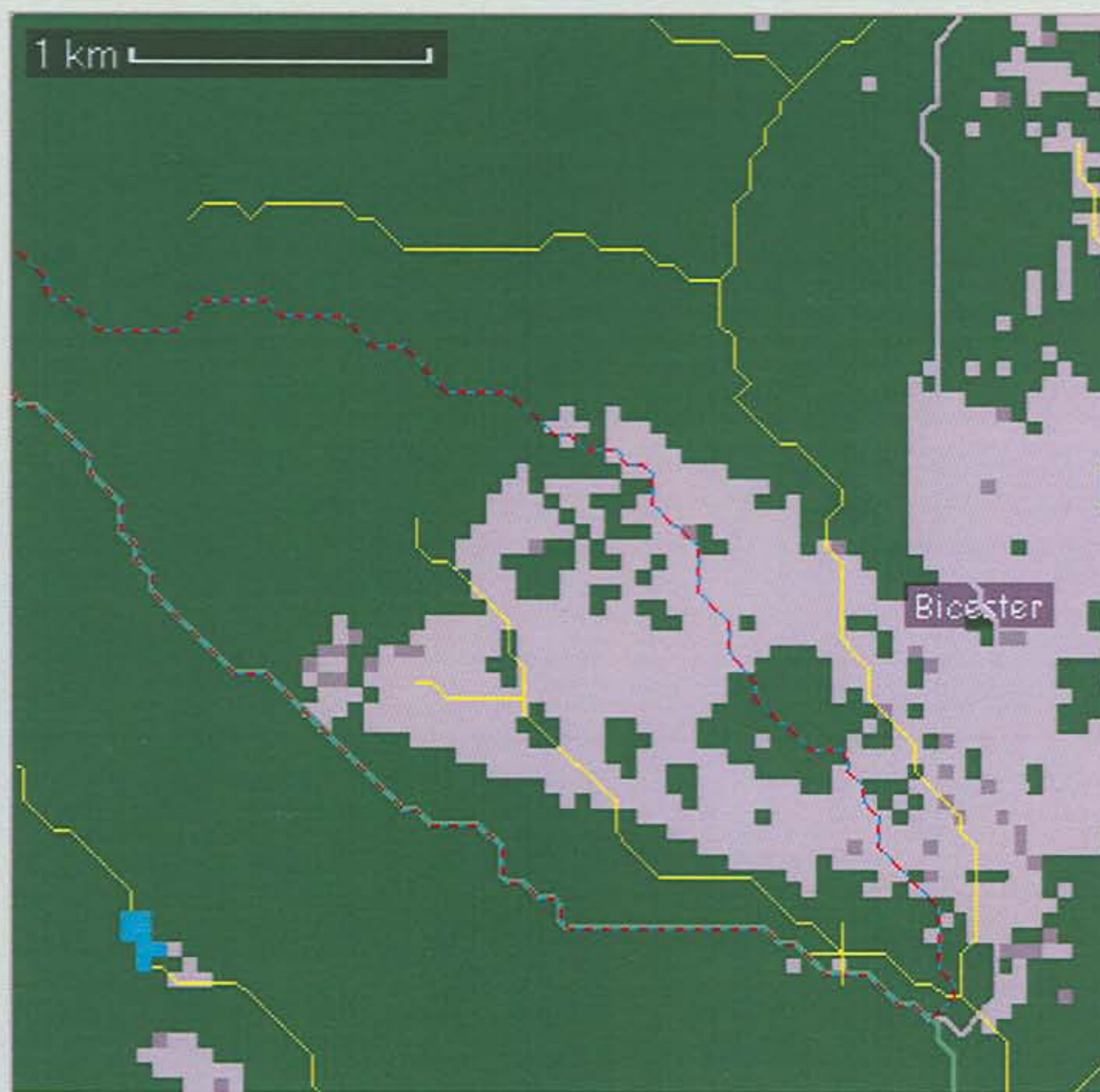
Yours sincerely



Sian Fairgrieve
Development Control Officer

Direct dial 01491 828678

Direct e-mail sian.fairgrieve@environment-agency.gov.uk



SP 58309 21885 NGR
 458309 221885 Numeric GR
 Numeric refs are Irish
 Locate... Gazetteer...
 Query...
 NI Border
 National Grids
 Land and Sea
 Urban areas
 Drainage paths
 Lakes
 Gazetteer search result
 Place names (major cities)
 Place name
 Flood peak/event stations All
 Exit

1999 FEH 458410 221561 [SP 58410 21561]

FEH CD-ROM 1999 - Catchment Descriptors

Subject Site Location : 458350 221850 [SP 58350 21850]

Catchment Descriptors

AREA : 3.45 km ²	RMED-1H : 10.0 mm
ALTBAR : 83.0 m	RMED-1D : 31.3 mm
ASPBAR : 136 degrees	RMED-2D : 38.9 mm
ASPVAR : 0.710	SAAR : 624 mm
BFIHOST : 0.899	SAAR4170 : 657 mm
DPLBAR : 2.39 km	SPRHOST : 9.5
DPSBAR : 12.20 m/km	URBCONC : 0.773
FARL : 1.000	URBEXT1990 : 0.157
LDP : 4.83 km	URBLOC : 0.769
PROPWET : 0.32	

Catchment average DDF values

C : -0.022	D3 : 0.251
D1 : 0.321	E : 0.290
D2 : 0.324	F : 2.467

1km point DDF values for 458000 222000 [SP 58000 22000]

C(1km) : -0.022	D3(1km) : 0.248
D1(1km) : 0.322	E(1km) : 0.289
D2(1km) : 0.323	F(1km) : 2.474