

FLOOD RISK ASSESSMENT
(focus on surface water management)

One new dwelling in FZ1

- Located wholly in EA FZ1
- Residual surface water flood risk
- Flood resilient measures can be incorporated
- Minimal increase in impermeable areas (0.5% increase)
- Appropriate mitigation measures to encourage waters away from egress / access points and from entering the lower floors

at:

Blue Moon Paddock, Woodfield Lane, Essendon,
AL9 6JJ

30 June 2015

ARK Environmental Consultancy Ltd

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1.0 Scope

This report contains the details of a Flood Risk Assessment carried out by Ark Environmental Consulting Limited (“ARK Ltd”) for Blue Moon Paddock, Woodfield Lane, Essendon, AL9 6JJ, henceforth referred to as “the site” in this report.

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Please note this report does not purport to provide definitive legal advice nor can it be used to demonstrate that the site will never flood in the future.

The Executive Summary contains an overview of key findings and conclusions. However, no reliance should be placed on the Executive Summary until the whole of the report has been read.

Other sections of the report may contain information which puts into context the findings noted within the Executive Summary.

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2.0 Executive Summary

This FRA has been carried out in accordance with the 27th March 2012 National Planning Policy Framework (NPPF). It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The proposed development is a new dwelling in FZ1 in a large field where there is existing impermeable areas similar in size to the proposed footprint.

This is categorized as a “More & Highly Vulnerable” landuse in FZ1: in accordance with the NPPF classifications the NPPF Exception test does not need to be passed. The main source of flooding is potential surface water flooding.

There are no sources of flooding except residual surface water flooding as defined by the SFRA, SWMP & PFRA.

Dry access to upper levels for the lifetime of the development is achievable and considered appropriate precautionary operation management.

Given the residual risk flood setting, the level, extent and depth of flooding on the site can be managed in terms of resilient measures and precautionary mitigation measures.

Based on the likely flooding risk, it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere; it is therefore considered appropriate development in accordance with the NPPF.

3.0 Introduction

The FRA combined a desktop study, review of available information, consultations and an assessment of all sources of flooding posed to and from the site and proposed development, in accordance with National Planning Policy Framework (NPPF). Appropriate flood mitigation

measures were then considered, either as already incorporated within the scheme or recommended for inclusion at detailed design stage. The suitability of the proposed development was also reviewed in the context of the NPPF and the technical guidance accompanying the NPPF.

4.0 Purpose of the Report

This FRA has been carried out in accordance with National Planning Policy Framework (NPPF). It is to be used to assist the Local Planning Authority (LPA) and Environment Agency (EA) when considering the flooding issues of the proposed development as part of a planning application.

The report provides the following information:

- An assessment of the flood risk posed to the site based on flood information and mapping provide by the EA and Strategic Flood Risk Assessment (SFRA);
- An assessment of the proposed development in terms of surface water run-off; and
- Proposals for measures to mitigate the flood risks posed to and from the development where appropriate.

5.0 Overview of British Legislation

5.1 National Planning Policy

The National Planning Policy Framework (NPPF) and accompanying Technical Guidance was published on the 27th March 2012. This supercedes all Planning Policy Statements (PPS's) and remaining Planning Policy Guidance (PPG's). Flood risk is retained as a key development consideration and is incorporated within Section 10: "Meeting the challenge of climate change, flooding and coastal change":

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere."

The Sequential and Exception Tests (as per PPS25) are retained as part of the NPPF. The accompanying NPPF Technical Guidance also includes Tables 2 and 3 (similar to Tables D2 & D3 of PPS25) to assist with flood risk vulnerability classifications and development suitability.

5.2 Local Policy

Local Authorities consider flood risk through relevant environmental and climate change policies which enforce the requirements of the NPPF.

The Strategic Flood Risk Assessment (SFRA) and Surface Water Management Plan (SWMP) are key sources of flood risk specific information for the area. The SFRA/SWMP provide more detailed review of flood risks and recommendations for ensuring developments can be constructed and operated safely in accordance with the NPPF. Greater detail is provided in the report.

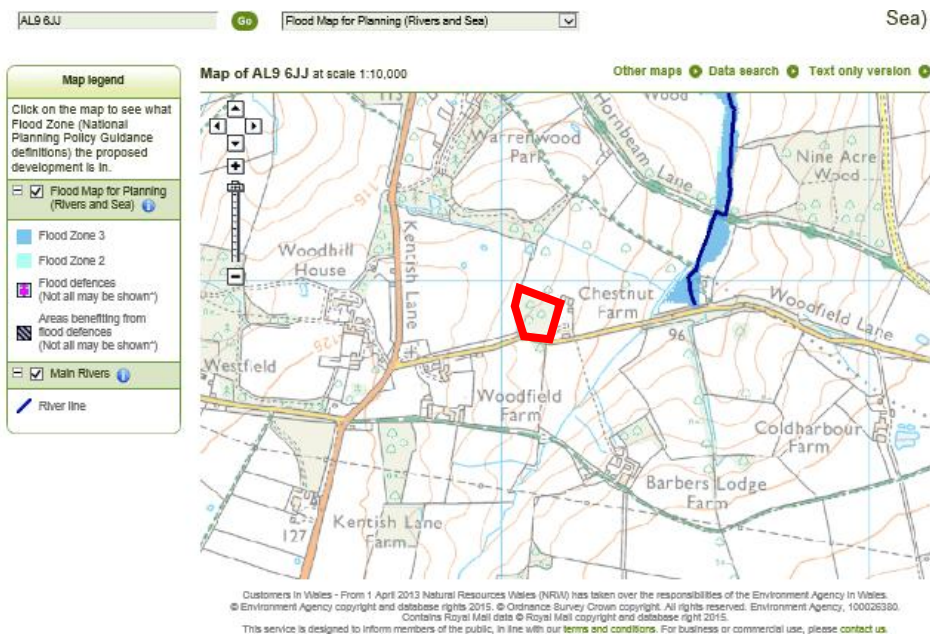
8.0 Site Status and Environmental Setting

8.1 Site Location and Status

The site is c. 1.3 hectare and is a field north of Woodfield Lane to the west of Chestnut Farm comprising two stables in the northeast of the site.

8.2 Existing Flood Risk

Flood Sources	Site Status	Comment on flood risk posed to / from the development
Fluvial / Tidal	Site is in Flood Zone FZ1 Low Risk	Scheme can reduce flood risk overall by storage on site and SUDS where feasible Proposed development is new build which can incorporate suitable mitigation measures.
Groundwater	SWMP indicates site not in potential elevated future groundwater risk area	The proposed development will not increase the risk of groundwater flooding Low Risk
Artificial Sources	No artificial sources within 200m	Low Risk
Surface Water / Sewer Flooding	Site is located adjacent a surface water risk zone to the east Condition, depth and location of surrounding infrastructure uncertain	Balance of existing impermeable areas given demolition of stables matches new build footprint If required: external landscaping mitigation to encourage floodwaters away from access / egress points Development will have no new connections to sewers but a managed cess system, gravity drainage where feasible and non-return valves Drainage strategy to ensure development will not increase the peak flow or volume of discharge from the site: Low Risk No further drainage assessment required
Climate Change	Included in the flood modelling extents Site not within climate change flood extent area	Development will not significantly increase the peak flow and volume of discharge from the site Low risk posed to and from the development



9.0 Assessment of Proposed Development

9.1 Proposed Development

The proposed development can be seen in Appendix B.

The proposed comprises:

- Demolish existing outbuildings
- Erect new dwelling
- 0.05% increase in impermeable areas
- No impact on any informal drainage ditches
- REDUCE FLOOD RISK OVERALL
 - New soft / permeable landscaped SUDS areas feasible

Potential Precautionary Additional Mitigation

- External landscaping as a flood resistant approach, encouraging water away from entrance points.

These are considered precautionary and not necessary given the residual risk.

9.2 Drainage

The development will utilize a cess system for foul and continue to drain to the land for surface water (eg: to swales) where appropriate (no direct connection to a formal drainage ditch required or existing). The drainage strategy (designed by others) where appropriate should be designed based on the following:

- Separate foul and surface
- Capacity based on the 1 in 100 year storm including for climate change

9.3 Impermeable vs Permeable

The application site is indeed c. 1.3 hectare but the scheme itself is a single dwelling which increases impermeable areas on the site only by 0.5%, given existing stable buildings to be removed.

The majority of the site will remain a field, permeable and therefore there will be no perceptible change in the hydrology of the site.

Evidence based on existing and proposed drawings:

Element	Existing (m2)	Proposed (m2)
Impermeable (hardstanding - building footprint, concrete areas)	200	267
Permeable (softscaping - grassed areas, (including green roof), permeable and porous paving)	13103	13036
Total (should be the site area and remain the same)	13303	13303

9.3b Drainage Calcs & Storage Requirements

Given

- the very small areas of impermeable involved vs the full site
- the fact that there will be no discharge (rates or volumes) from the site existing and proposed
- the fact that adequate storage can easily been incorporated on site

the following assumptions have been made, because the SUDSUK calculations cannot deal with such insignificant changes in areas:

In order to address the c. 300m² of impermeable areas of the site (worse case as scheme only increases by 67m²), the SUDSUK calculations include for the site being 1000m² and hence the area of impermeable areas being 500m² – see Appendix B SUDSUK Calcs.

This is a large overestimate to demonstrate how the scheme can easily accommodate the 0.5% increase in impermeable areas.

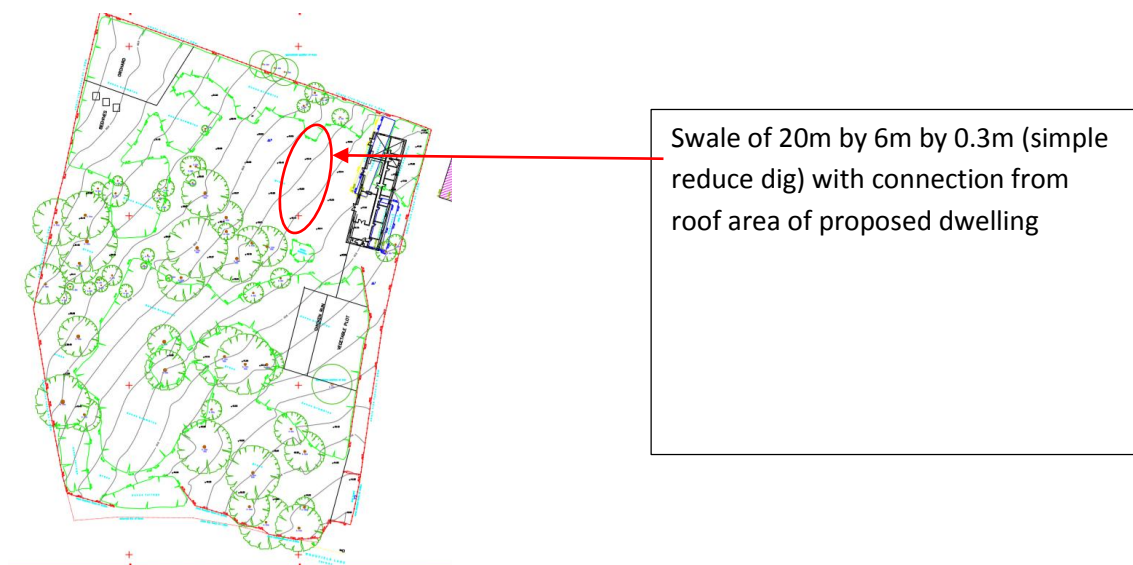
With restricting the discharge (although in reality no discharge from site) to greenfield minimum rate of 5l/s

- Recommended therefore max storage area of 32.94m²
- Easily accommodated in >13ha of available land to re-landscape

Recommended SUDS technique:

- swales can be incorporated around the proposed dwelling /adjacent in order to manage storage of peak storm flows from the roof area of the dwelling
- swale could be a reduced dig area of 20m by 6m by 0.3m = 36m²

See also section on SUDS & flood resilient measures that can be incorporated as appropriate.



The following flood resilient measures are to be incorporated as appropriate:

9.4 Flood Resilience

The proposed development will utilize the flood resilient techniques recommended in the NPPF Technical Guidance where appropriate and also the recommendations that have previously been issued by various councils.

- Waterproofing to be installed to above ground level as appropriate
- Plasterboards will be installed in horizontal sheets rather than conventional vertical installation methods to minimise the amount of plasterboard that could be damaged in a flood event
- Wall sockets will be raised to as high as is feasible and practicable in order to minimise damage if flood waters inundate the property
- Any wood fixings on ground floor will be robust and/or protected by suitable coatings in order to minimise damage during a flood event
- Airbricks will be raised to as high as is feasible and practicable
- The Damp Proof Membrane will be installed above the main floor slab and tied in to the walls where appropriate, to reduce the turnaround time for returning the property to full operation after a flood event.

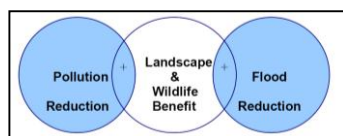
9.5 SUDS

The site is 98% permeable as existing and remains c. 98% permeable; regardless the drainage strategy will address through storage and continued managed discharge to the surrounding field.

No connection to sewers hence no impact; cess system to be used; managed removal of waste to STW.

Concept SUDS Strategy


The following diagram indicates the philosophy behind the proposed SUDS strategy, and is taken from the EA's SUDS guidance:



(Source: Environment Agency, 2009)

The Table below indicates the SUDS Hierarchy Appraisal for the site and proposed development:

Table 2: Site Specific SUDS Appraisal

SUDS Hierarchy	SUDS Technique	Potential Benefits			Site Specific	
		Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit	?	Scheme Specific SUDS Suitability Appraisal and Comment
Most Sustainable  Least Sustainable	Living Roofs	•	•	•	*	Could be incorporated but not considered necessary
	Ponds / Basins	•	•	•	*	Could be incorporated
	Swales	•	•	•	*	Could be incorporated adjacent to new dwelling
	Infiltration Techniques	•	•		*	Permeable areas continue to drain as existing
	Permeable Surfaces	•	•		✓	Permeable areas continue to drain as existing
	Tanked Systems	•			X	Not considered necessary for this schme

Key:
 Potentially suitable at the site: * Incorporated in the scheme: ✓ Not suitable / possible at the site: X

9.6 Refuge and Evacuation

Range of Flood Events

The site is in FZ1 and at low risk from all other sources hence no further flood response assessment is required.

9.7 Annual Monitoring

Occupiers should contact the EA on an annual basis to confirm the flood status of the property.

If the flood status has changed, the evacuation and refuge plan should be reviewed and updated by suitable flood risk consultants as appropriate.

9.8 Surface Water Runoff – Flood Risk from the Development

In accordance with the NPPF, this FRA also considers the risks posed from the development to surrounding areas.

Given the drainage strategy feasible, it is considered there will be no increase in surface water discharge from the site; the proposed development will also continue to drain to the land.

The proposals will incorporate new low-water demand devices such that there is not likely to be an increase in peak flows or volume of flows.

No connection to sewers hence no effect on surrounding infrastructure as there will be no connection. There will not be any significant increase in overland flow from the site.

9.9 Climate Change

The impact of climate change in accordance with the NPPF is likely to be an increase in the rainfall intensity in the future, which will increase peak storm flows to sewer. The proposed development will not connect to sewers and continue to drain in a managed and restricted way to the surrounding large field it is considered therefore that flows in the future are not likely to have a significant impact, even with an allowance for climate change.

Confirmation from Thames Water should be sought as appropriate.

9.10 Flood Risk Vulnerability

According to the NPPF retained Flood Risk Vulnerability Classification as per the former Table D2 in PPS25, the upper dwellings would be classed as “More Vulnerable”, the lower ground dwellings would be classified as “Highly Vulnerable”.

The NPPF also retained Flood Risk Vulnerability and Flood Zone “Compatibility” Classification as per the former Table D3 of PPS25; this states that “More Vulnerable” developments in Flood Zone 1 are appropriate and do not require the Exception Test (retained by NPPF) to be passed.

Based on the data reviewed to date, the flood risk assessment recommends the development could be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere.

10.0 Conclusion

The site is considered to be generally at a low risk from all sources of flooding except the potential residual surface water risk; the EA website map and SFRA indicate the site is in Flood Zone 1.

The scheme is a dwelling in a large field.

The proposed development is categorised as “More Vulnerable” in accordance with the NPPF; it is therefore an appropriate type of development within Flood Zone 1. Suitable mitigation measures can be incorporated.

The proposed scheme can incorporate a suitable drainage storage and restricted discharge to large field area as existing and flood resilient measures.

Based on the likely flooding risk, it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere and is therefore appropriate development in accordance with the NPPF.

11.0 Appendices

- A. Existing Plans, Location/Topo
- B. Proposed Development Plans (shows stables to be demolished also)

Appendices A & B