



FloodSmart

Site address	Hillock Lane Gresford Wrexham Approximate postcode: LL12 8YL
Site coordinates	335994, 354541
Report prepared for	Delamere Homes Pulford Limited Monarchy Hall Farm Tirley Lane Utkinton Tarporey Cheshire CW6 0JZ
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Report authors	Alexandra Sherred & Jennifer Allen Consultants
Report check & review	Alan White Principal Consultant



1. Executive summary

The Planning Policy Wales (PPW) (2016) and Technical Advice Note 15 (TAN 15) (2004) requires Flood Consequence Assessments (FCA) to review flooding from all potential sources. A review has been undertaken of national environmental data sets to assess the potential flood risk to the Site. The review is provided within this concise interpretative report written by an experienced GeoSmart consultant.

Site analysis

Source of Flood Risk	Baseline	After Mitigation
River (fluvial) and Sea (coastal/tidal)	Negligible	N/A
Surface water (pluvial) flooding	Very Low/Low	N/A
Groundwater flooding	Negligible	N/A
Other flood risk factors present	No	N/A
Is any other further work recommended?	Yes	Yes (see below)

N/A = mitigation not required

The Site is currently greenfield and used within an agricultural capacity. Development proposals comprise of a residential development of circa 125-135 homes.

The flood risks from all sources have been assessed as part of this report and are as follows:

- According to Natural Resources Wales' (NRW) Flood Zone Map, the Site is located within fluvial Flood Zone 1 (low probability);
- According to NRW's Development Advice Map (DAM) the Site is located within Zone A which is considered to be at little or no risk of fluvial or tidal/coastal flooding (TAN15, 2004);
- According to NRW's Risk of Flooding from Rivers and Sea (RoFRS) map, which considers the type, condition and crest height of flood defences, the Site has a Negligible risk of flooding from Rivers and the Sea;
- According to NRW's Risk of Flooding from Surface Water (pluvial) flood map, the Site is at Very Low risk of pluvial flooding across the majority of the Site, with a very small isolated area of Low risk along the central southern boundary;
- According to GeoSmart's Groundwater Flood Risk (GW5) Map, the Site is at Negligible risk of groundwater flooding during a 1% annual probability (1 in 100 year) event; and

- According to NRW's Risk of Flooding from Reservoir mapping, the Site is not at risk of reservoir flooding.

Recommendations / Next steps

Recommendations for mitigation are provided below, based upon the proposed development and the flood risk to the Site:

- The regular maintenance of any existing and proposed drains and culverts surrounding, or on the Site should be undertaken to reduce the flood risk caused by blockages.
- A Sustainable Drainage Strategy (SuDS) should be developed for the Site, for effective management of surface water runoff from the proposed development.

GeoSmart recommend the mitigation measures discussed within this report are considered as part of the proposed development where possible and evidence of this is provided to the Local Planning Authority as part of the planning application.

2. Introduction

Background and purpose

This assessment has been undertaken by firstly compiling information concerning the Site and the surrounding area. The information gathered was then used to construct a 'conceptual site model', including an understanding of the appropriateness of the development as defined in the PPW (2016) and the source(s) of any flood risk present. Finally, a preliminary assessment of the steps that can be taken to manage any flood risk to the development was undertaken.

This report has been prepared with reference to the TAN 15 (2004) which supplements the PPW (2016).

The general approach of PPW, supported by the TAN, is to advise caution in respect of new development in areas at high risk of flooding by setting out a precautionary framework to guide planning decisions. The overarching aim of the precautionary framework is, in order of preference, to:

- Direct new development away from those areas which are at high risk of flooding; and
- Where development is considered to be in high risk areas (Zone C) only those developments which can be justified on the basis of the tests outlined in section 6 are located within such areas.

The purpose of this report is to provide clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at the Site.

Report scope

A thorough review of a commercially available flood risk report and NRW supplied data indicating potential sources of flood risk to the Site from rivers and coastal sources, surface run-off (pluvial), groundwater and reservoirs, including historical flood information and modelled flood extent. Appropriate measures are recommended to manage and mitigate the flood risk to the property.

Information obtained from NRW and a review of the Wrexham County Borough Council Flood Risk Management Plan (FRMP) 2016-2021 (Taunt, 2016) has been used to ascertain local flooding issues and, where appropriate, identify information to support a Justification test and Assessment of Flood Consequences required as part of the PPW (2016).

Using available data, the existing and future flood risks to and from the Site from all flood sources will be assessed in line with current best practice.

An indication of potential flood risk from the Site to downstream receptors is provided where the proposed development increases run-off from the Site.

Report limitations

It is noted that the findings presented in this report are based on a desk study of information supplied by third parties. Whilst we assume that all information is representative of past and present conditions we can offer no guarantee as to its validity and a proportionate programme of site investigations would be required to fully verify these findings.

This report excludes consideration of potential hazards arising from any activities at the Site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities.

Datasets

The following table shows the sources of information that have been consulted as part of this report:

Table 1: Datasets consulted to obtain confirmation of sources of flooding and risk

Source of flooding	Datasets consulted			
	Commercial Flood Maps and GW5 Data (Appendix B)	FRMP*	Natural Resources Wales (Appendix C)	OS Data
Historical	X	X	X	
Rivers (fluvial) / Sea (tidal)	X	X	X	
Surface water (pluvial)	X	X	X	
Groundwater	X	X		
Sewer		X		X
Culvert/bridges		X		X
Reservoir		X	X	

*Wrexham County Borough Council Flood Risk Management Plan 2016-2021 (Taunt, 2016) & supporting information on the datasets used is provided in the relevant appendix.

3. Site analysis



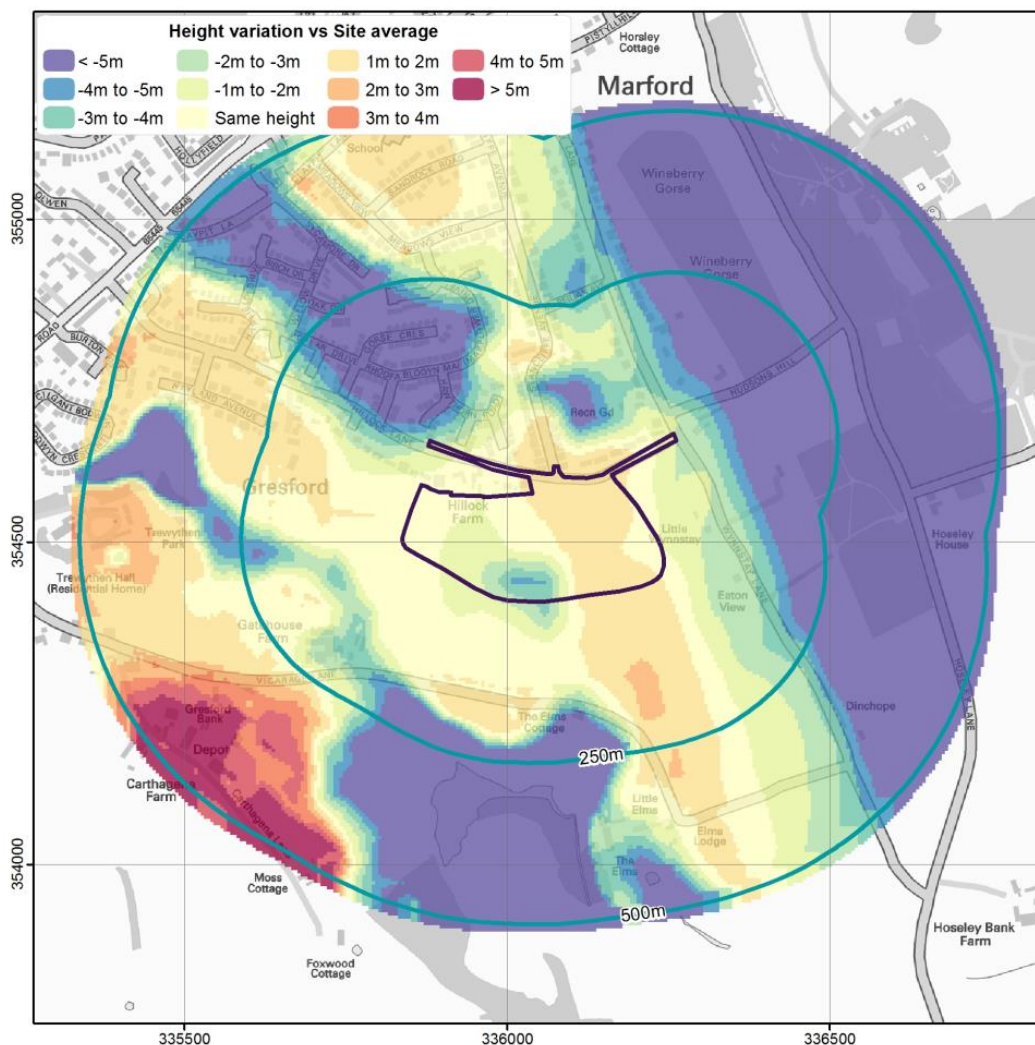
Site information

The Site is located in the village of Gresford, north of Wrexham in a setting of residential and agricultural land use at National Grid Reference SJ 35994, 354541. Site plans and drawings are provided in Appendix A.

Using a 500 m around the Site, the area is varied in topography (Figure 1). It is noted that land to the East falls gradually to c 30 m above Ordnance Datum (AOD). To the South, West and North, land is relatively flat before falling slightly to c 60 mAOD, in the South and West and to c 68 mAOD to the northwest.

According to OS data, the general level of the Site is higher in the North East, at c 75 mAOD, with a lower level along the Southern boundary at c 71 mAOD. This is based on EA elevation data obtained for the Site to a 2 m resolution with a vertical accuracy of ± 150 mm (Appendix C).

Figure 1 Site Location and Relative Elevations



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Development

The Site is currently greenfield and used within an agricultural capacity. Development proposals comprise of a residential development of circa 125-135 homes (Appendix A). The effect of the overall development will result in an increase in number of occupants and/or users of the Site and will result in the change of use, nature or times of occupation. The estimated lifespan of the development is 100 years.

The proposed development is classed as Highly Vulnerable according to Table 9 (Summary of Policy Requirements) in TAN 15 (2004).

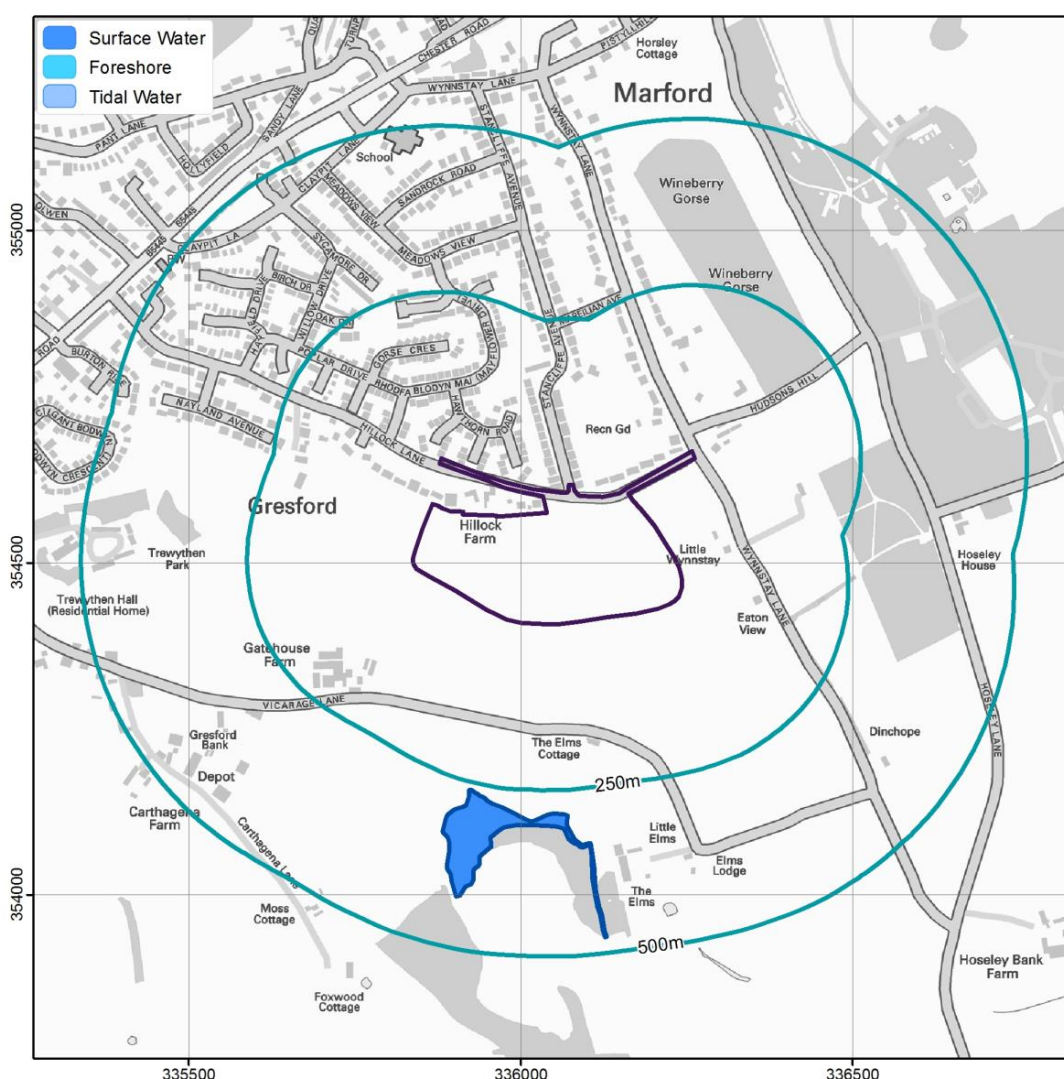


Hydrological features

Watercourses/surface water features within 500 m of the Site:

There is a mapped waterbody approximately 260 m south, down gradient, of the proposed development site (Figure 2).

Figure 2 Surface water features



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Proximity to relevant infrastructure:

There is no relevant infrastructure within close proximity to the Site.



Hydrogeological features

British Geological Survey (BGS) mapping indicates that the underlying superficial geology consists of Sand and Gravel (BGS, 2019) and is classified as a Secondary (A) Aquifer (EA, 2019).

BGS mapping indicates that the underlying bedrock geology consists of consists of predominately Kinnerton, Sandstone to the East with Salop formation of Mudstone and Sandstone to the West (BGS, 2019) and these are classified as a Principal Aquifer and a Secondary (A) Aquifer respectively (EA, 2019).

Approximately 50% of the Site to the East is within a groundwater Source Protection Zone (NRW, 2019).

4. Flood risk to the development

Historical flood events

According to NRW's historical flood map, no historical flood events have been recorded at the Site (NRW, 2019).

Guidance

The purpose of historical flood data is to provide information on where and why flooding may have occurred in the past. The absence of any recorded events does not mean flooding has never occurred on Site or that flooding will never occur at the Site.

Rivers (fluvial) / Sea (coastal/tidal) flooding

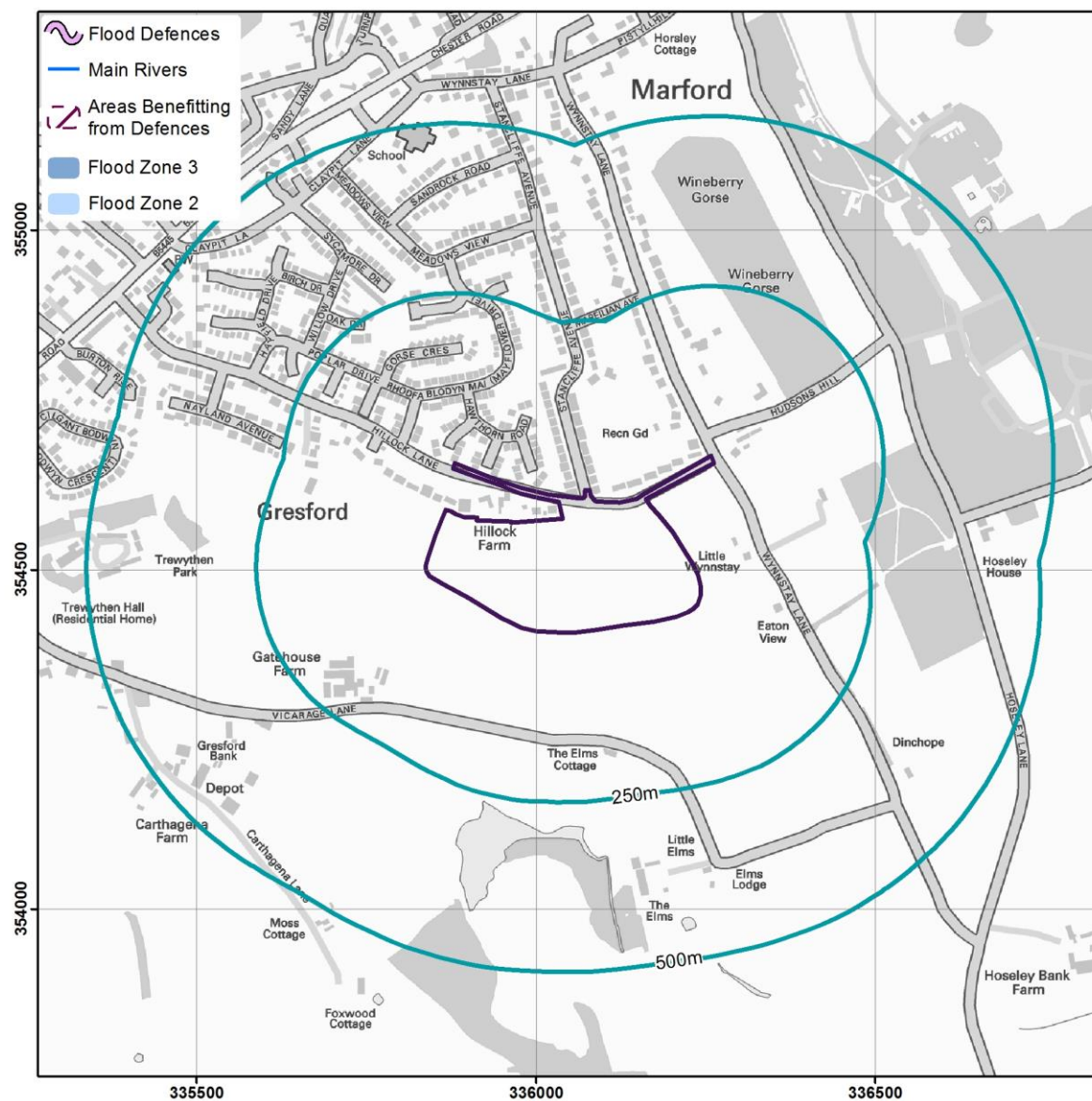
According to NRW's Flood Zone Map (Figure 3), the Site is located within fluvial Flood Zone 1 and is therefore classified as having a Low probability of flooding.

Guidance

As defined in the PPW (2016) and TAN15 (2004):

Ignoring the presence of any defences, land located in a Flood Zone 1 is considered to have a low probability of flooding, with less than a 1 in 1000 annual probability of fluvial or coastal flooding in any one year.

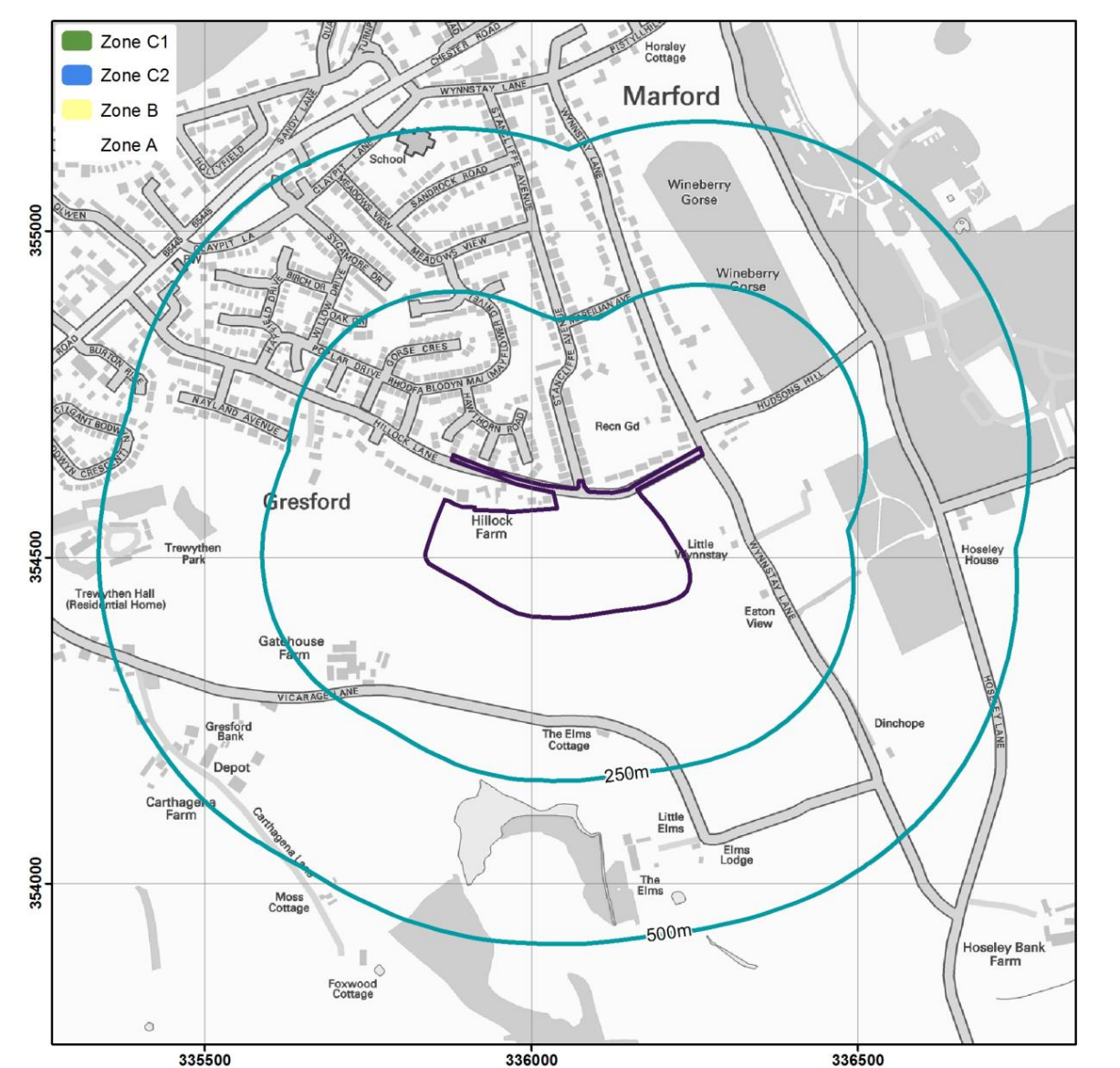
Areas that benefit from the presence of defences in a 1 in 100 (1%) chance of flooding each year from rivers; or 1 in 200 (0.5 %) chance of flooding each year from the sea. If the defences were not there, these areas would flood in a 1 in 100 (1%)/ 1 in 200 (0.5 %) or larger flooding incident.



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within Zone
ing (TAN15,

Figure 4 Development Advice Map (NRW, 2019)

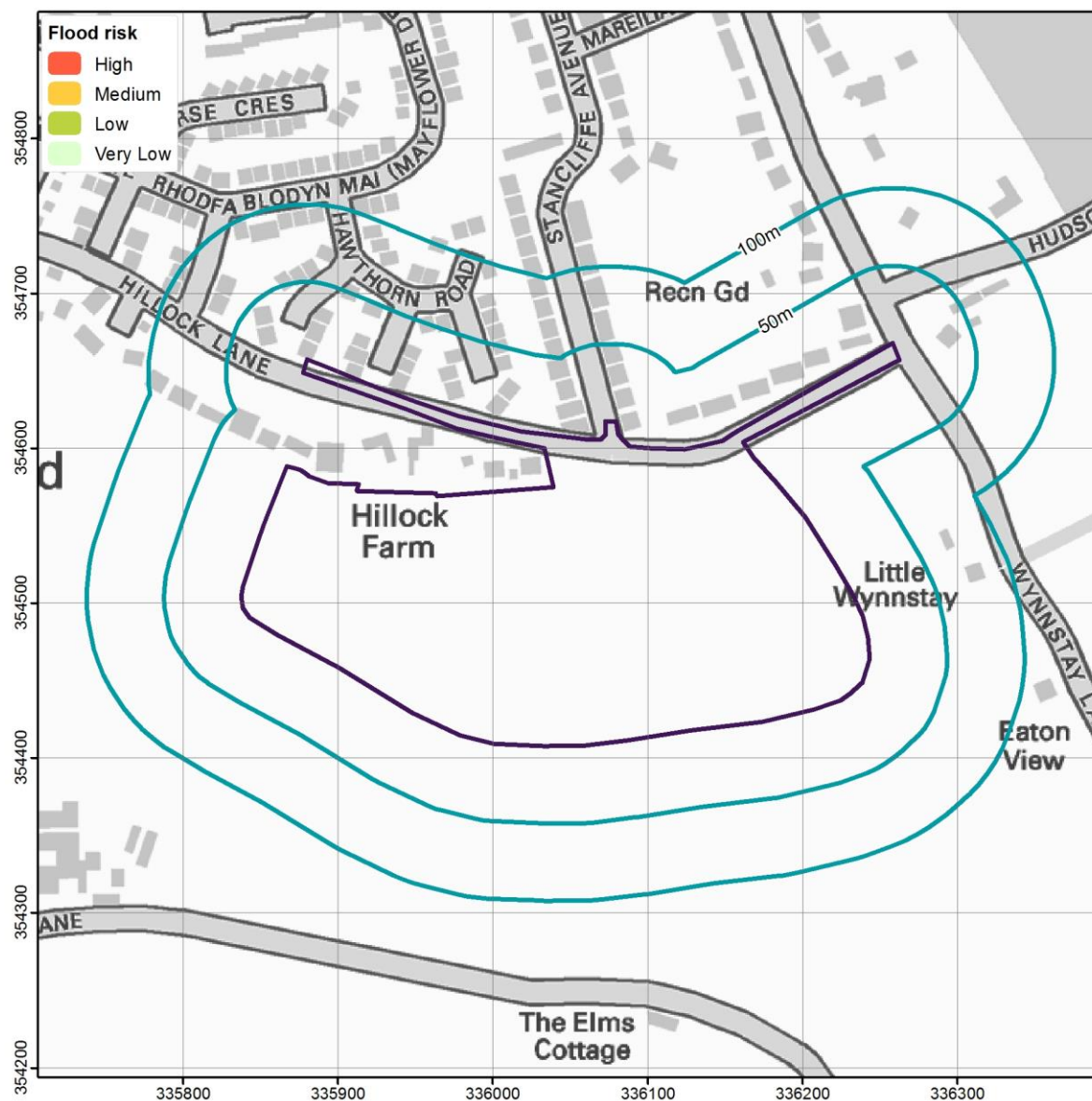


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Flood risk

According to NRW's Risk of Flooding from Rivers and the Sea (RoFRS) mapping (Figure 5), the flood risk from Rivers and the Sea is negligible.

Figure 5 Risk of Flooding from Rivers and Sea map (NRW, 2019)

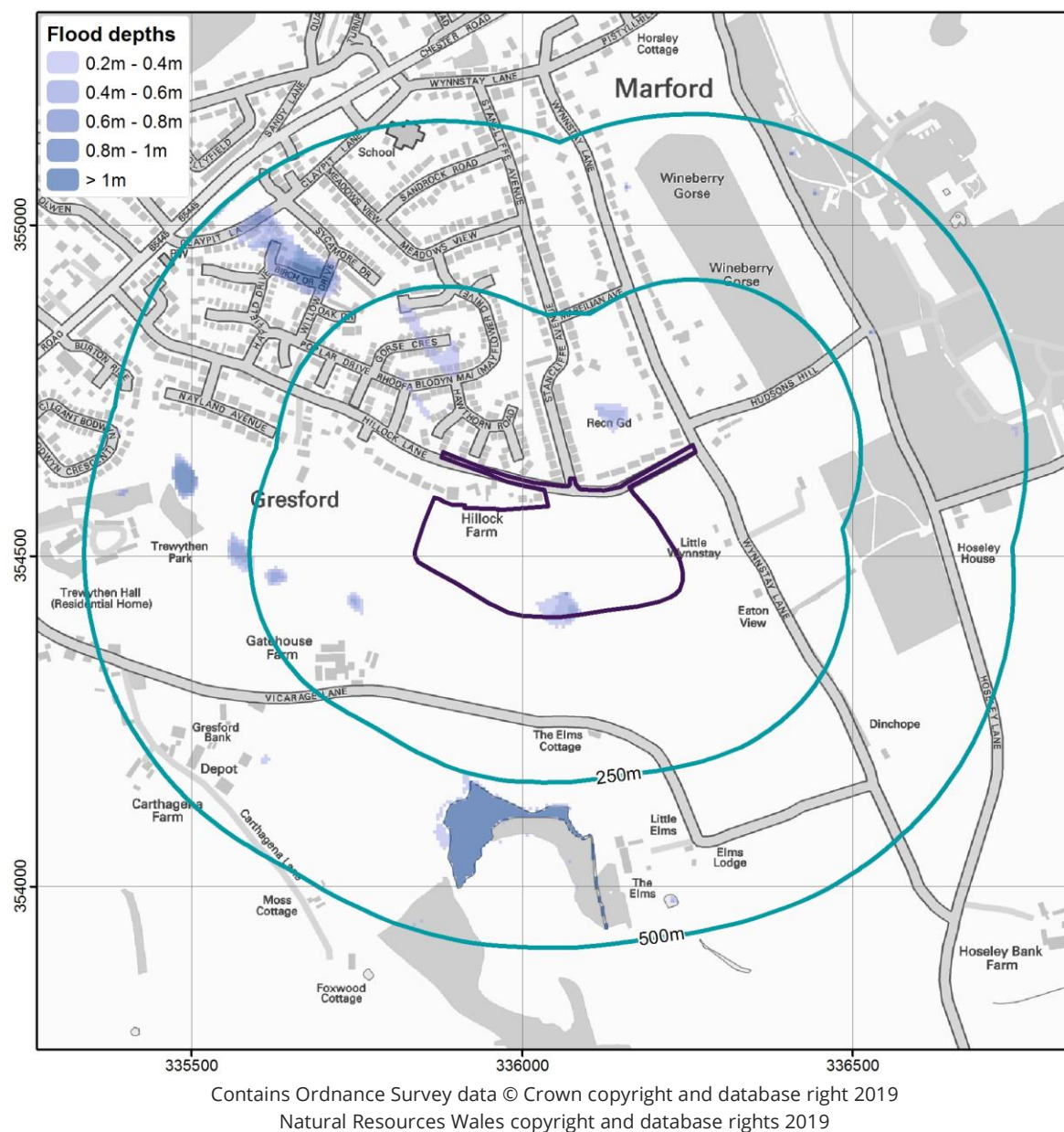


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Surface water (pluvial) flooding

According to NRW's Risk of Flooding from Surface Water (pluvial) mapping for a 1 in 100 year pluvial event (Figure 6), there is a Low risk of pluvial flooding found on the southern boundary of the Site, however flood depths are typically below 0.6 m. The remainder of the Site has a Very Low pluvial flood risk.

Figure 6 NRW Medium and Low surface water flood risk map (NRW, 2018)



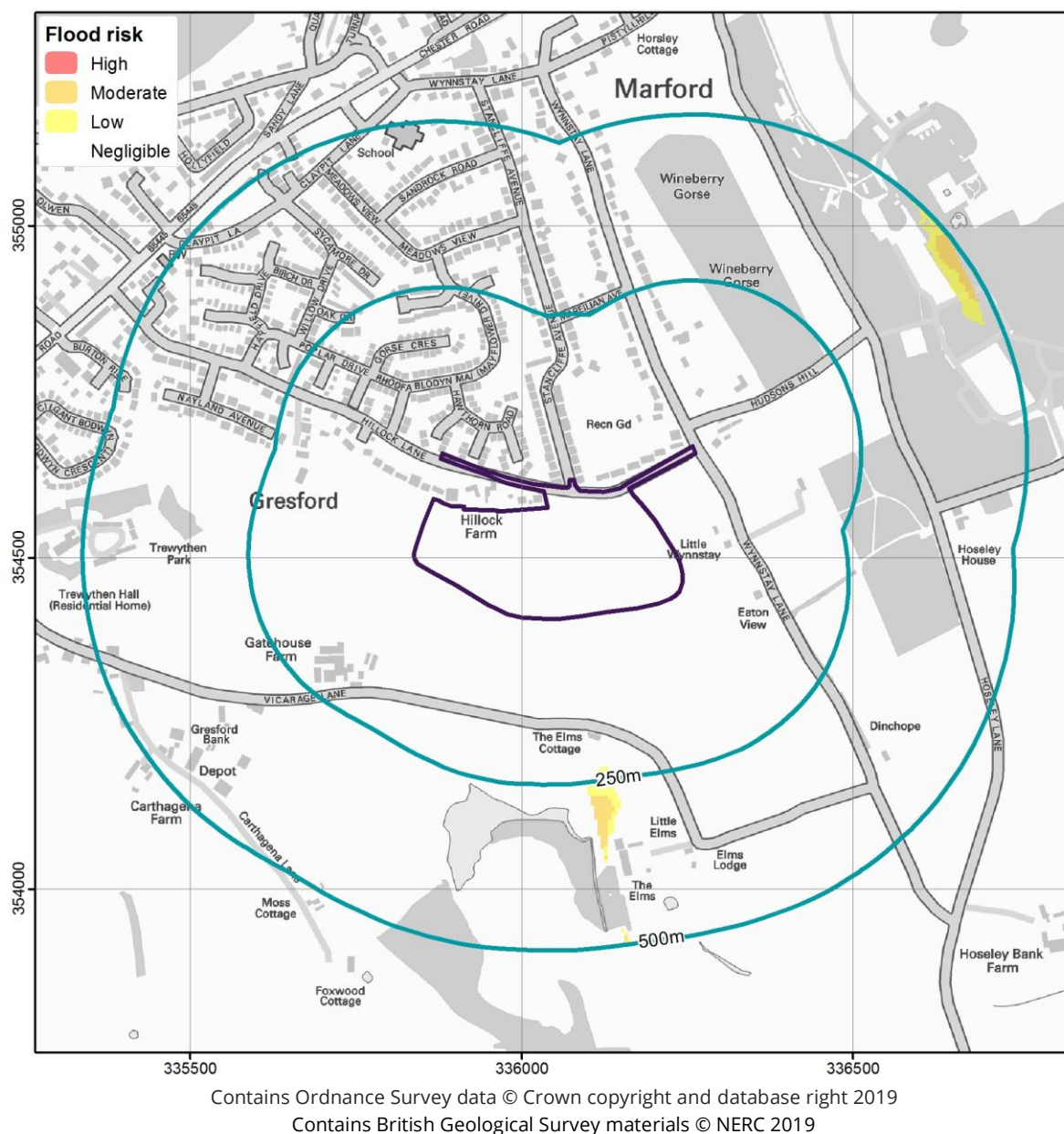
Guidance

According to NRW's surface water flood risk map, a site at Low risk has a chance of flooding of between a 1 in 1000 and 1 in 100 (0.1% and 1%).

Groundwater flooding

GeoSmart's Groundwater Flood Risk (GW5) Map (Figure 7) confirms the Site is considered to be at Negligible risk of groundwater flooding. The map confirms the risk of groundwater emergence at the surface during a 1% annual probability (1 in 100 year) event.

Figure 7 GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2019)



Guidance

According to GeoSmart (2019) there is a Negligible risk of groundwater flooding in this area and any groundwater flooding incidence will be less frequent than 1 in 100 years return period.

Negligible Risk - There will be a remote possibility that incidence of groundwater flooding could lead to damage to property or harm to other sensitive receptors at, or near, this location.

Flooding from Artificial Sources

Sewer flooding

There are no records of sewer flooding incidences within the FRMP (Taunt, 2016).

Guidance

Properties classified as “at risk” are those that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system either once or twice in the ten-year reference period. Records held by the sewage utility company provide information relating to reported incidents, the absence of any records does not mean that the Site is not at risk of flooding.

Canal Failure

According to Ordnance Survey (OS) mapping, there are no canals within 500 m of the Site.

Water supply infrastructure

Water supply infrastructure is comprised of a piped network to distribute water to private houses or industrial, commercial or institution establishments and other usage points. In urban areas, this represents a particular risk of flooding due to the large amount of water supply infrastructure, its condition and the density of buildings. The risks of flooding to properties from burst water mains cannot be readily assessed.

If more information regarding the condition and history of the water supply infrastructure within the vicinity of the Site is required, then it is advisable to contact the local water supplier Dwr Cymru Welsh Water.

Culverts and bridges

Culverts and bridges have not been identified within 500 m of the Site.

Reservoir flooding

According to NRW's Risk of Flooding from Reservoir mapping the Site is not at risk of flooding from reservoirs (NRW, 2019).

Guidance

The risk of reservoir flooding is related to the failure of a large reservoir (holding over 25,000 m³ of water) and is based on the worst-case scenario. Reservoir flooding is extremely unlikely to occur (NRW, 2019).

5. Flood risk from the development

Floodplain storage

As the development is located within Flood Zone 1 and DAM Zone A, there would be no losses in floodplain storage as a result of the development. Therefore, compensation for any loss in flood plain storage will not be required.

Drainage and run-off

A surface water drainage strategy report will be prepared separately for the Site (ref: 72009R1) to ensure surface water can be managed effectively through the use of SuDS features, over the lifetime of the proposed development, including sufficient allowances for climate change.

6. Suitability of the proposed development

The information below outlines the suitability of proposed development in relation to national and local planning policy.

National

The aims of the national planning policies TAN15 (2004) and PPW (2012 and 2016) are achieved through application of the Justification Test and by assessing Flood Consequences. The key requirements of these are outlined below:

Guidance

Justification Test: New developments should be directed away from Zone C and towards suitable land in Zone A, otherwise Zone B, where river or coastal flooding will be less of an issue. In Zone C the tests outlined in sections 6 and 7 of TAN15 will be applied, recognizing, however, that highly vulnerable development and Emergency Services in Zone C2 should not be permitted. All other new development should only be permitted within Zones C1 and C2 if determined by the planning authority to be justified in that location.

Assessing Flood Consequences: If a development proposal in Zone C1, or in C2 and if it is defined as being of low vulnerability, it would meet the test outlines in section 6, however it should be noted that those developments would be more likely to flood and appropriate mitigation would need to be planned accordingly. This section applies to Zone C, and those parts of Zone B where flooding has been identified as a material consideration to allow for localised problems.

Assessing whether a development should proceed or not will depend upon whether the consequences of flooding of that development can be managed and reduced to a level which is acceptable for the nature/type of proposed development, including its effects on existing development.

Suitability of the proposed development, and whether a Justification Test is required, is based on the Development Advice Map Zone the Site is located in and the flood risk vulnerability classification of the development proposals.

As the whole Site proposed for development is located within DAM Zone A and the proposed development is defined as Highly Vulnerable, according to Table 9 (Summary of Policy Requirements) in TAN 15 (2004) and included in Table 2 below; the Justification Test is not applicable.

Table 2: Flood risk vulnerability and flood zone 'compatibility (taken from TAN15, 2004)

DAM Zone	Development Type	Planning Requirements	Acceptability Criteria	Development Advice
A	Emergency Services, highly vulnerable development, less vulnerable development, other	- Justification test not applicable - Refer to surface water requirements	No increase in flooding elsewhere	No constraints relating to river or coastal flooding, other than to avoid increasing risk elsewhere
B	Emergency services & Highly vulnerable development	- If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further - Refer to surface water requirements	- Acceptable consequences for nature of use - Occupiers aware of flood risk - Escape/Evacuation routes present - Effective flood warning provided - Flood emergency plans and procedures - Flood resistant design - No increase in flooding elsewhere	Generally suitable for most forms of development. Assessments where required, are unlikely to identify consequences that cannot be overcome or managed to an acceptable level. It is unlikely, therefore, that these would result in a refusal of planning consent on the grounds of flooding.
	Less vulnerable development	Refer to surface water requirements	- Occupiers aware of flood risk - No increase in flooding elsewhere	
	Other	Refer to surface water requirements	No increase in flooding elsewhere	
C1	Emergency services, highly vulnerable development, less vulnerable development	- Application of justification test including acceptability of consequences - Refer to surface water requirements	- Acceptable consequences for nature of use - Flood defences adequate - Agreement for construction and maintenance costs secured - Occupiers aware of flood risk - Escape/evacuation routes present - Effective flood warning provided - Flood emergency plans and procedures - Flood resistant design - No increase in flooding elsewhere	Plan allocations and applications for all development can only proceed subject to justification in accordance to section 6 of TAN 15 and acceptability of consequences in accordance to section 7 and Appendix 1 of TAN 15
	Other	- Application of acceptability of consequences (TAN 15 section 7 and Appendix 1) - Refer to surface water requirements	- Acceptable consequences for nature of use - Occupiers aware of flood risk - Desirable if effective flood warning and evacuation routes/procedure provided depending on nature of proposal - No increase in flooding elsewhere	Plan allocations and applications for development should only be made if considered acceptable in accordance with section 7 and Appendix 1 of TAN 15
C2	Emergency services, highly vulnerable development	The flooding consequences associated with Emergency Services and highly vulnerable developments are not considered to be acceptable. Plan allocations should not be made for such developments and planning applications not proposed		
	Less vulnerable development	Application of justification test (section 6 of TAN 15), including acceptability of consequences (section 7 and	- Acceptable consequences for nature of use - Flood defences adequate - Agreement for construction and maintenance costs secured - Occupiers aware of flood risk - Escape/evacuation routes present - Effective flood warning provided	Plan allocations or applications for less vulnerable development can only proceed subject to justification in accordance with section 6 of TAN 15

		Appendix 1 of TAN 15) Refer to surface water requirements	Flood emergency plans and procedures	and acceptability of consequences in accordance with section 7 and Appendix 1 of TAN 15
	Other	- Application of acceptability of consequences (section 7 and Appendix 1 of TAN 15) - Refer to surface water requirements	- Flood resistant design - No increase in flooding elsewhere - Acceptable consequences for nature of use - Occupiers aware of flood risk - Effective flood warning provided - No increase in flooding elsewhere	Plan allocations and applications for development should only be made if considered acceptable in accordance with section 7 and Appendix 1 of TAN 15.

Local policy and guidance

For this report, several documents have been consulted for local policy and guidance and relevant information is outlined below:

Wrexham County Borough Council Flood Risk Management Plan (FRMP) 2016-2021 (Taunt, 2016)

- "Flooding remains a key threat to communities across Wales, and managing this risk through careful planning is important to minimise the risk to communities. Flood risk management planning allows risk management authorities (RMAs) to develop a better understanding of risk from all sources of flooding and agree on priorities to manage that risk."*

Guidance

Strategic Flood Consequence Assessments (SFCA) are carried out by local authorities, in consultation with NRW, to assess the flood risk to the area from all sources both now and in the future due to climate change.

7. Resilience and mitigation

Based on the available information mitigation measures outlined within this section of the report are likely to help protect the development from flooding.

Rivers (fluvial) / Sea (coastal/tidal) mitigation measures

As the Site is located within Flood Zone 1 and DAM Zone A, flooding is unlikely to affect the Site from fluvial and/or tidal sources, therefore mitigation measures are not considered to be required.

Surface water (pluvial) flood mitigation measures

As the Site is not identified as at risk of pluvial flooding, mitigation measures are not required.

However, the regular maintenance of any drains and culverts surrounding/on the Site should be undertaken to reduce the flood risk.

A surface water drainage strategy will be prepared separately (ref: 72009R1) to ensure surface water runoff can be managed effectively over the lifetime of the proposed development.

Groundwater flood mitigation measures

As the Site is not identified as being at risk of groundwater flooding, mitigation measures are not required.

Reservoir flood mitigation measures

According to NRW information, the Site is not at risk of flooding from reservoirs.

Other flood risk mitigation measures

As the Site is not identified as at risk from other sources, mitigation measures are not required.

8. Conclusions and recommendations

A **NEGLIGIBLE** fluvial flood risk has been identified.

A **VERY LOW/LOW** surface water (pluvial) flood risk has been identified.

A **NEGLIGIBLE** groundwater flood risk has been identified.

The Site is not located in an area classified as being at risk of flooding from reservoir failure.

Providing the recommended mitigation measures are put in place it is likely that flood risk to this Site will be reduced to an acceptable level.

The table below provides a summary of where the responses to key questions are discussed in this report.

Table 3: Summary of responses to key questions in the report

Key sources of flood risks identified	None (see Section 3).
Are standard mitigation measures likely to provide protection from flooding to/from the Site?	Yes (see Section 7).
Is any further work recommended?	
Recommendations for mitigation are provided below, based upon the proposed development and the flood risk to the Site: • The regular maintenance of any existing and proposed drains and culverts surrounding, or on the Site should be undertaken to reduce the flood risk caused by blockages. • A Sustainable Drainage Strategy (SuDS) should be developed for the Site, for effective management of surface water runoff from the proposed development. GeoSmart recommend the mitigation measures discussed within this report are considered as part of the proposed development where possible and evidence of this is provided to the Local Planning Authority as part of the planning application.	

9. References and glossary

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Planning Policy Wales (2004). Technical Advice Note 15: Development and Flood Risk.

Planning Policy Wales (2014 and 2016). Planning Policy Wales, Edition 7 and 9 respectively, July 2014 & November 2016.

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UK Flood Maps (Ambiental FTP) (2019). UKFloodMap4™ Data

Glossary

General terms

BGS	British Geological Survey
NRW	Natural Resources Wales
GeoSmart groundwater flood risk (GW5) model	GeoSmart's national groundwater flood risk model takes advantage of all the available data and provides a preliminary indication of groundwater flood risk on a 50m grid covering England and Wales. The model indicates the risk of the water table coming within 1 m of the ground surface for an indicative 1 in 200 year return period scenario.
Dry-Island	An area considered at low risk of flooding (e.g. In a Flood Zone 1) that is entirely surrounded by areas at higher risk of flooding (e.g. Flood Zone 2 and 3)
Flood resilience	Flood resilience of wet-proofing accepts that water will enter the building, but through careful design will minimise damage and allow the re-occupancy of the building quickly. Mitigation measures that reduce the damage to a property caused by flooding can include water entry strategies, raising electrical sockets off the floor, hard flooring.
Flood resistance	Flood resistance, or dry-proofing, stops water entering a building. Mitigation measures that prevent or reduce the likelihood of water entering a property can include raising flood levels or installation of sandbags.
Flood Zone 1	This zone has less than a 0.1% annual probability of river flooding
Flood Zone 2	This zone has between 0.1 and 1% annual probability of river flooding and between 0.1% and 0.5 % annual probability sea flooding
Flood Zone 3	This zone has more than a 1% annual probability of river flooding and 0.5% annual probability of sea flooding
Functional Flood Plain	An area of land where water has to flow or be stored in times of flood.
DAM Zone A	Development Advice (DAM) Zone A is considered to be at little or no risk of fluvial or tidal/coastal flooding
DAM Zone B	Areas known to have been flooded in the past evidenced by sedimentary deposits
DAM Zone C1	Areas of the floodplain which are developed and served by significant infrastructure, including flood defences
DAM Zone C2	Areas of the floodplain without significant flood defence infrastructure
Area Benefitting from Defences	Areas that benefit from the presence of defences in a 1 in 100 (1%) chance of flooding each year from rivers; or 1 in 200 (0.5 %) chance of flooding each year from the sea. If the defences were not there, these areas would flood in a 1 in 100 (1%)/ 1 in 200 (0.5 %) or larger flooding incident.
Hydrologic model	A computer model that simulates surface run-off or fluvial flow. The typical accuracy of hydrologic models such as this is $\pm 0.25\text{m}$ for estimating flood levels at particular locations.

OS	Ordnance Survey
Residual Flood Risk	The flood risk remaining after taking mitigating actions.
SFCA	Strategic Flood Consequence Assessment. This is a brief flood consequence assessment produced by the local council
SuDS	A Sustainable drainage system (SuDS) is designed to replicate, as closely as possible, the natural drainage from the Site (before development) to ensure that the flood risk downstream of the Site does not increase as a result of the land being developed. SuDS also significantly improve the quality of water leaving the Site and can also improve the amenity and biodiversity that a site has to offer. There are a range of SuDS options available to provide effective surface water management that intercept and store excess run-off. Sites over 1 Ha will usually require a sustainable drainage assessment if planning permission is required. The current proposal is that from April 2014 for more than a single dwelling the drainage system will require approval from the SuDS Approval Board (SABs).

Aquifer Types

Principal aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
Secondary A aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.
Secondary B aquifer	Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
Secondary undifferentiated	Has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
Unproductive Strata	These are rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.

TAN15 (2004) terms

Justification test	New development should be directed away from zone C and towards suitable land in zone A, otherwise to zone B, where river or coastal flooding will be less of an issue. In zone C the tests outlined in sections 6 and 7 will be applied, recognising, however, that highly vulnerable development and Emergency Services in zone C2 should not be permitted. All other new development should only be permitted within zones C1 and C2 if determined by the planning authority to be justified in that location. Development, including transport infrastructure, will only be justified if it can be demonstrated that:-
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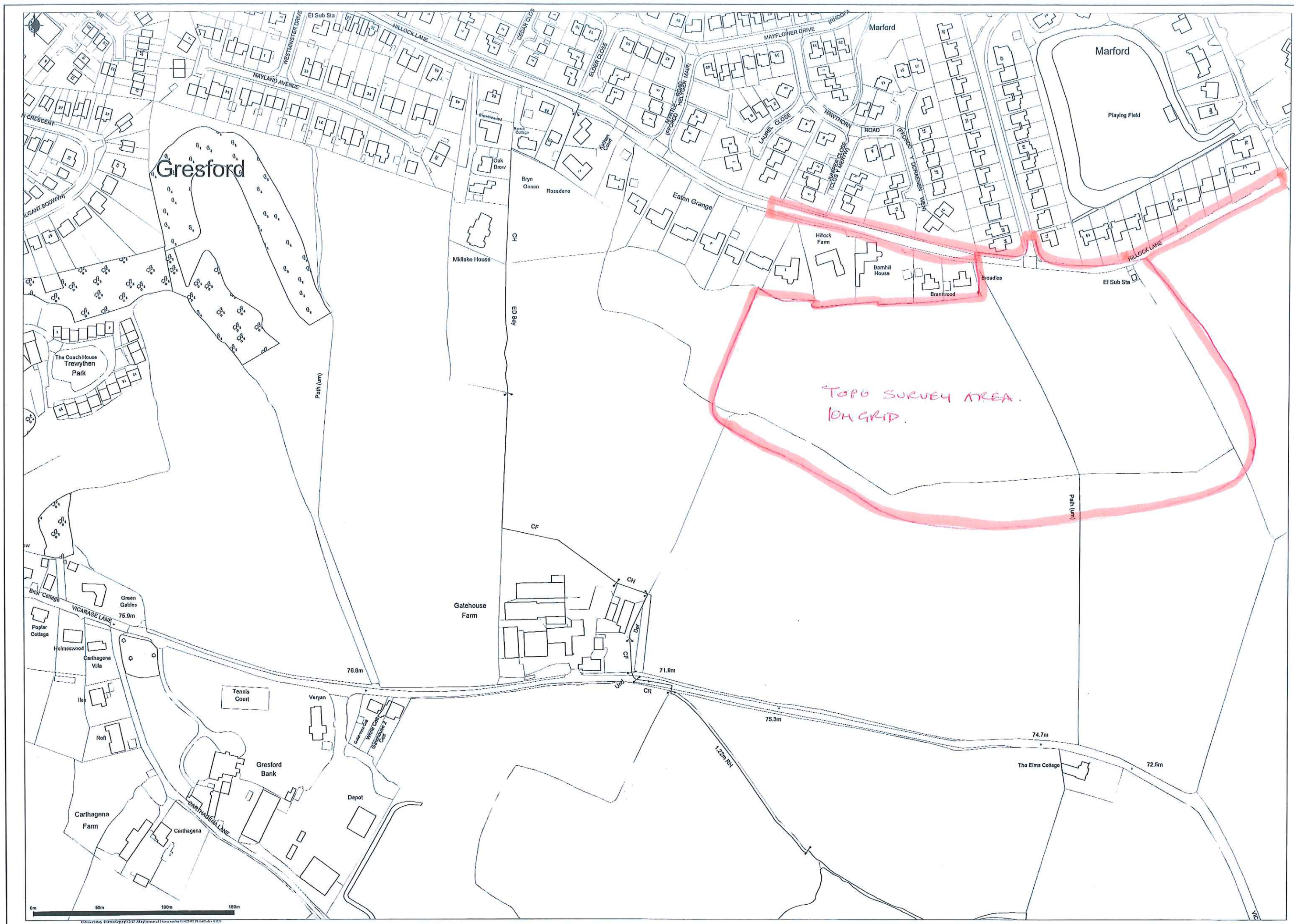
- i. Its location in zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement 1;
- or,
- ii. Its location in zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region; and,
- iii. It concurs with the aims of PPW and meets the definition of previously developed land (PPW fig 2.1); and,
- iv. The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in sections 5 and 7 and appendix 1 found to be acceptable.

Emergency Services	hospitals, ambulance stations, fire stations, police stations, coastguard stations, command centres, emergency depots and buildings used to provide emergency shelter in time of flood.
Less vulnerable	General industrial, employment, commercial and retail development, transport and utilities infrastructure, car parks, mineral extraction sites and associated processing facilities, excluding waste disposal sites.
Highly vulnerable	all residential premises (including hotels and caravan parks), public buildings (e.g. schools, libraries, leisure centres), especially vulnerable industrial development (e.g. power stations, chemical plants, incinerators), and waste disposal sites.

Appendices

Appendix A

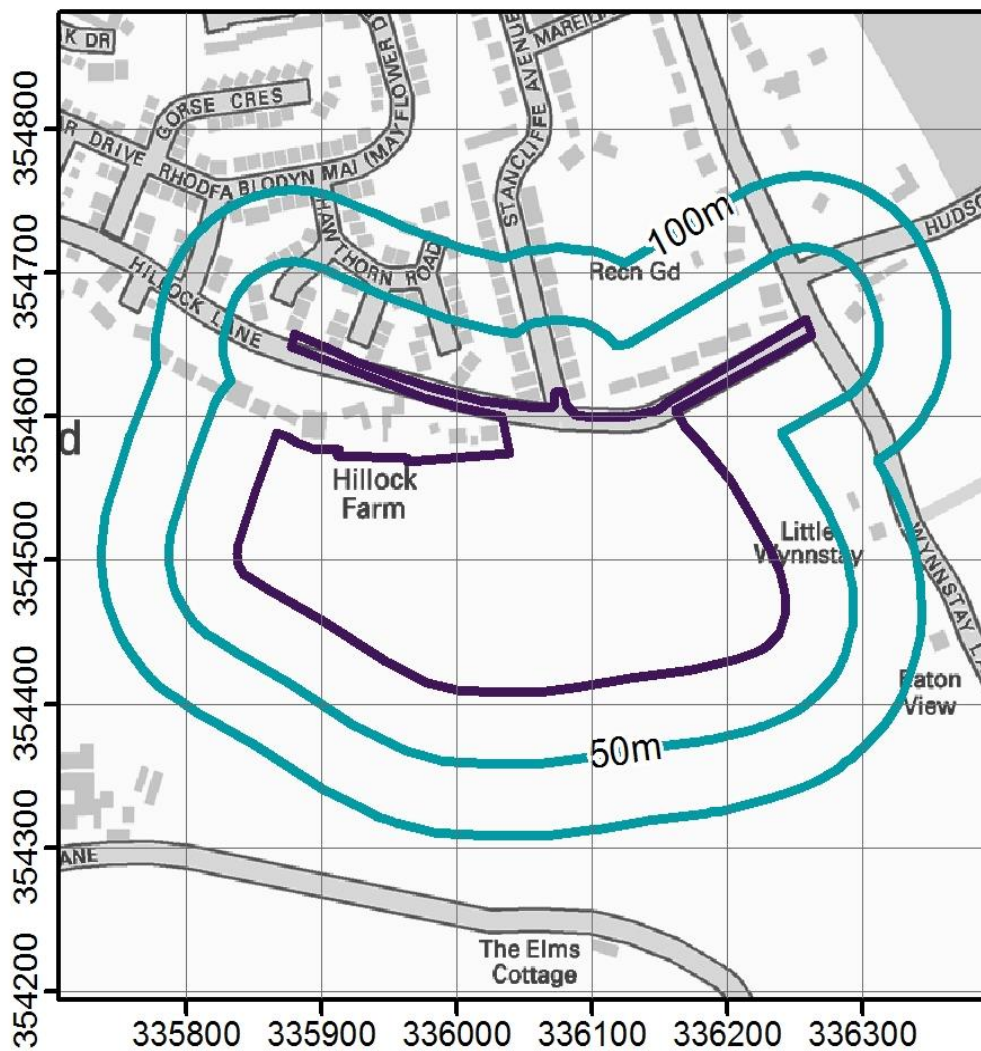
Site Plans



Appendix B

Commercial flood mapping

Site Location Plan (OS, 2019)



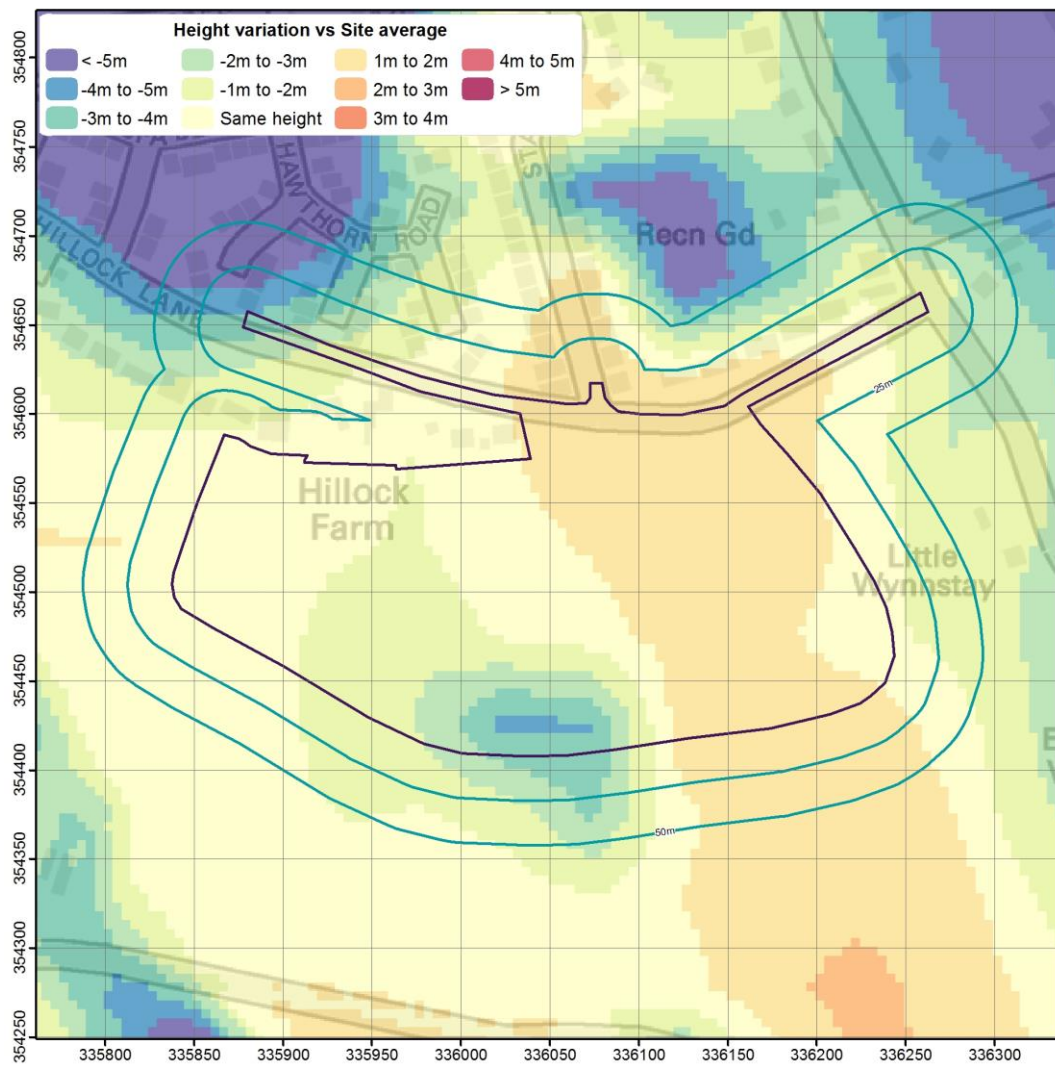
Contains Ordnance Survey data © Crown copyright and database right 2019

Aerial Photograph (BlueSky, 2019)



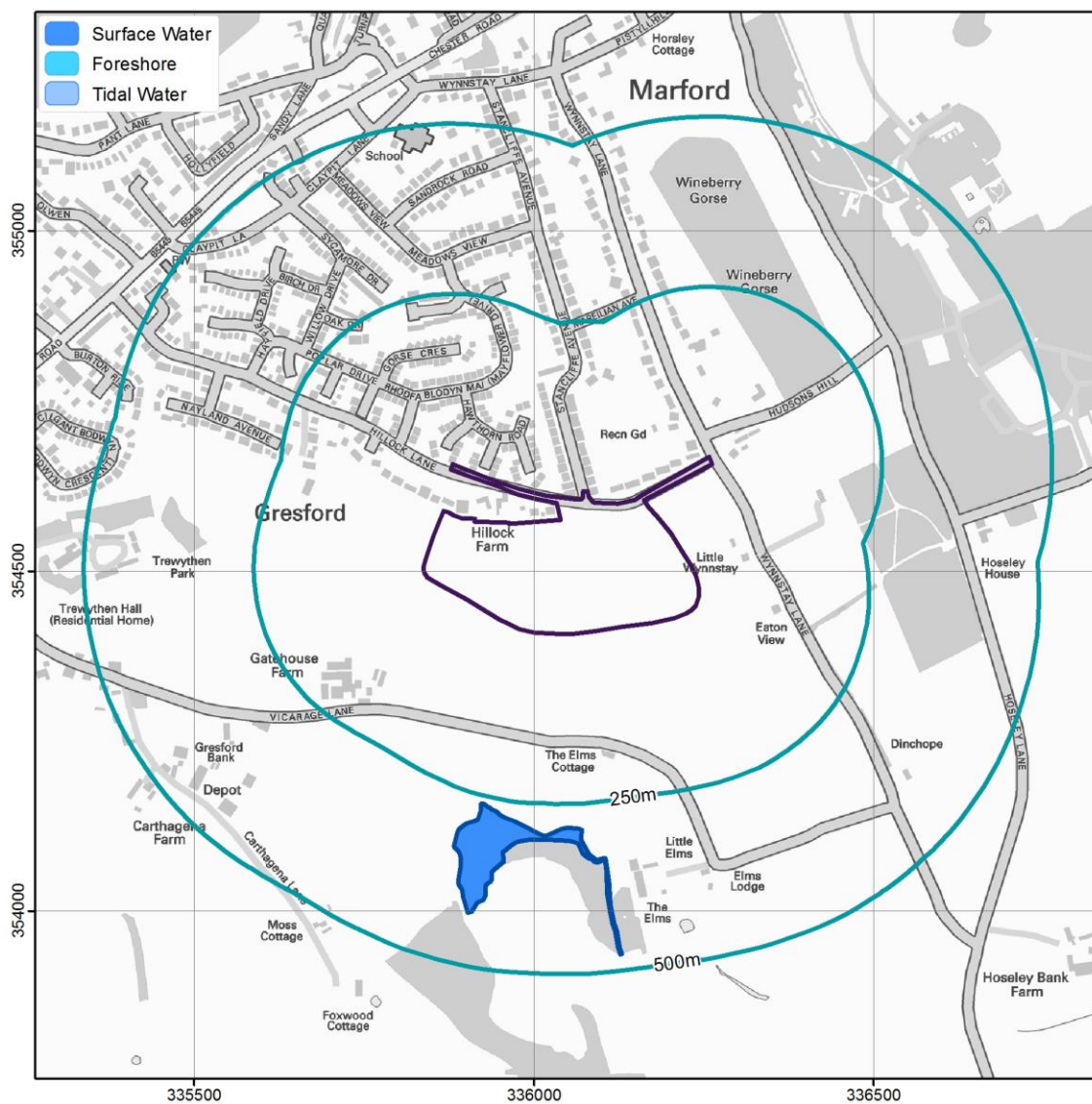
Contains Ordnance Survey data © Crown copyright and database right 2019
BlueSky copyright and database rights 2019

GeoSmart DTM5 (5 m) map (NRW, 2019)



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Natural Resources Wales copyright and database rights 2019

Ordnance Survey Surface Water Feature Vector Map (OS, 2019)



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Natural Resources Wales copyright and database rights 2019

Natural Resources Wales Historic Flood Map (NRW, 2019)



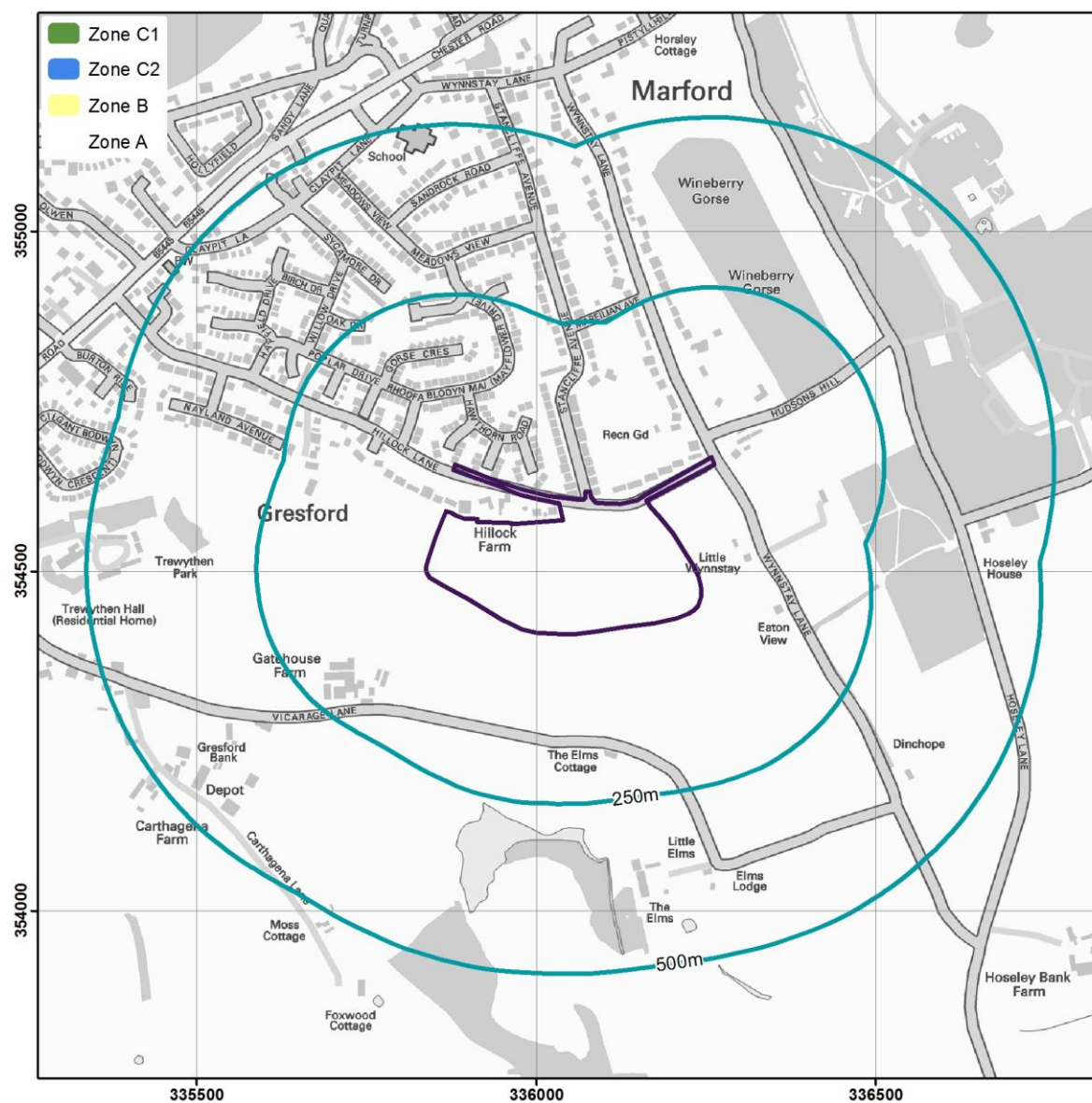
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Natural Resources Wales Flood Map for Planning Purposes (NRW, 2019)



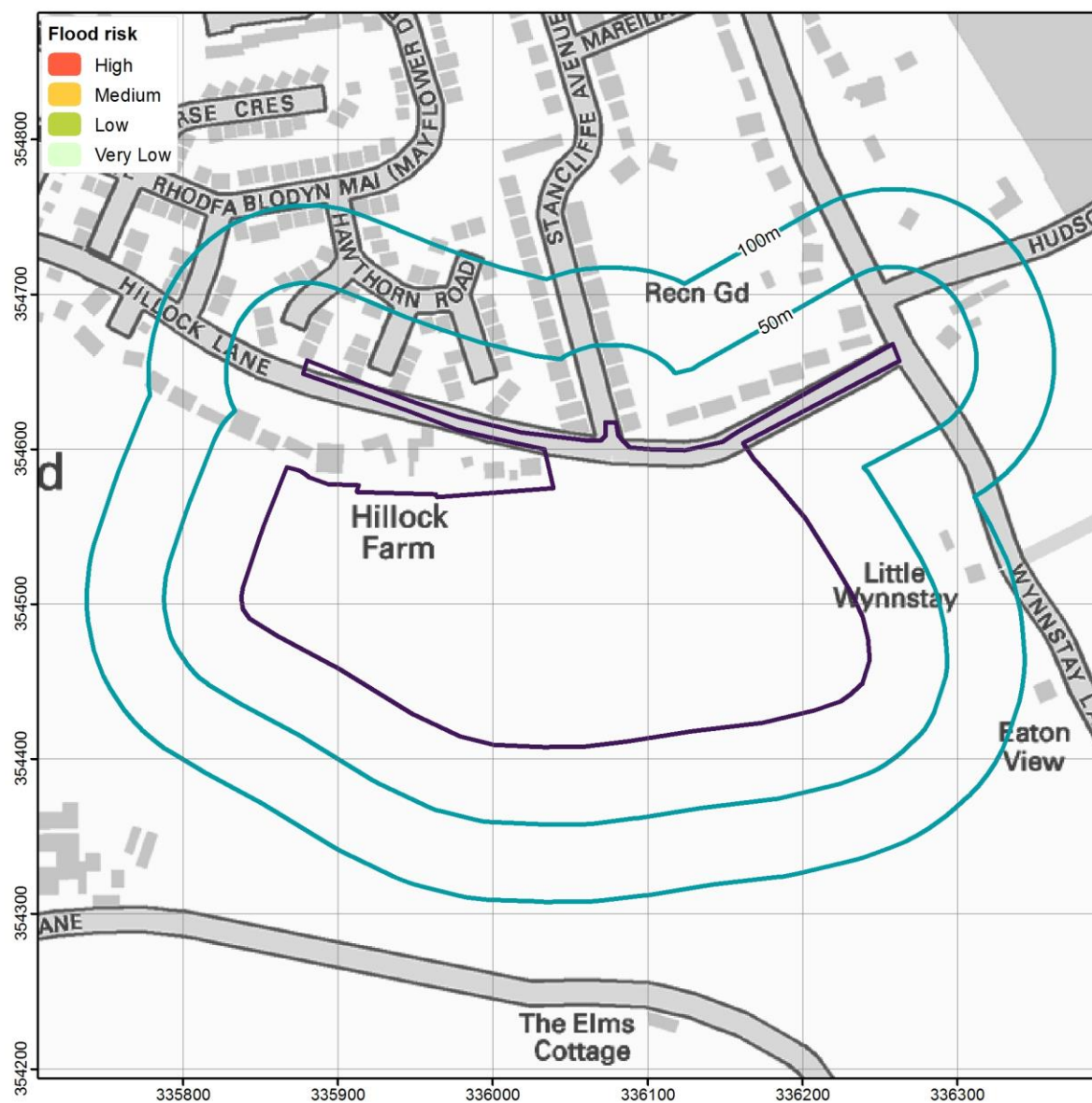
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Natural Resources Wales Development Advice Map (NRW, 2019)



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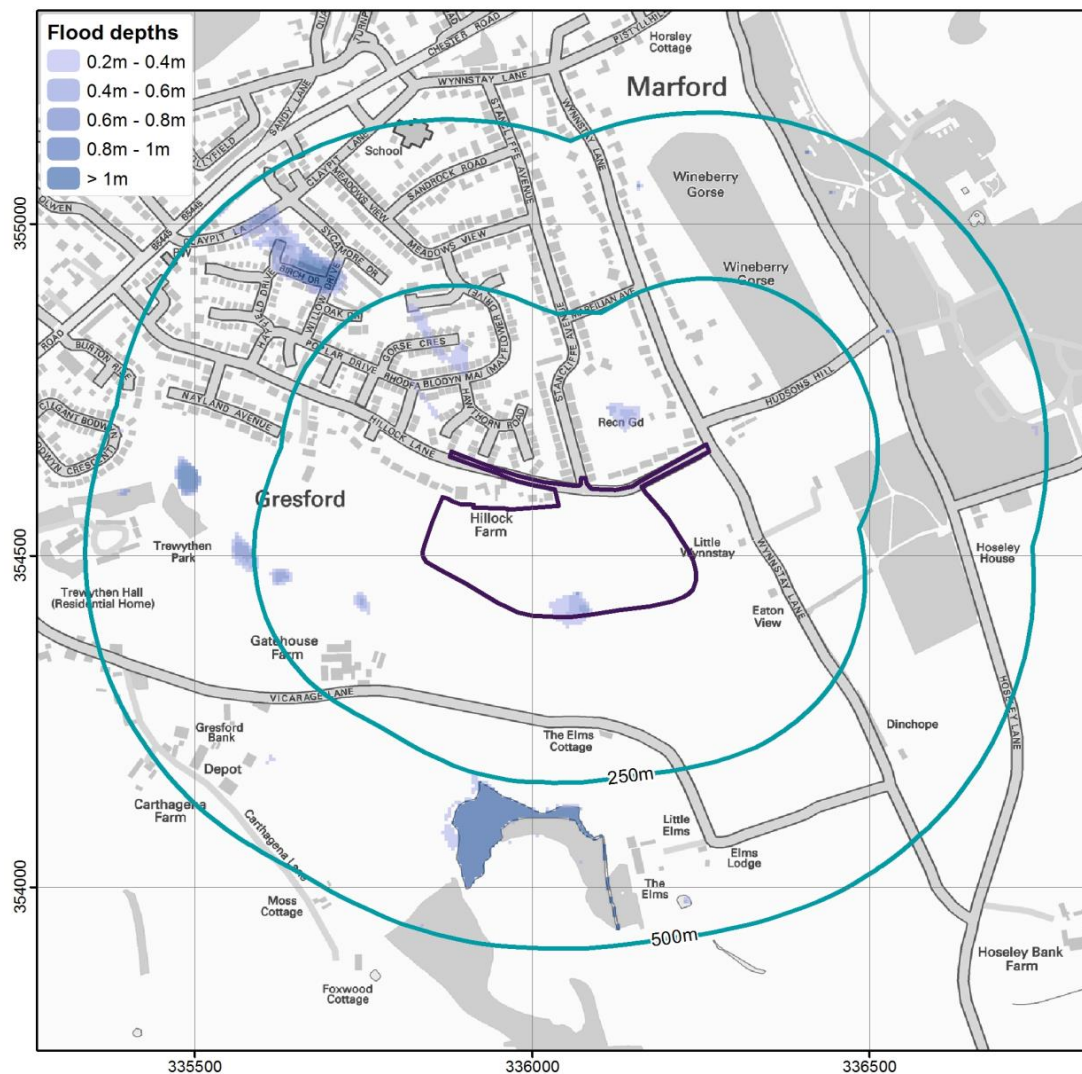
Natural Resources Wales Flood Risk from Rivers and Sea map (NRW, 2019)



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Natural Resources Wales copyright and database rights 2019

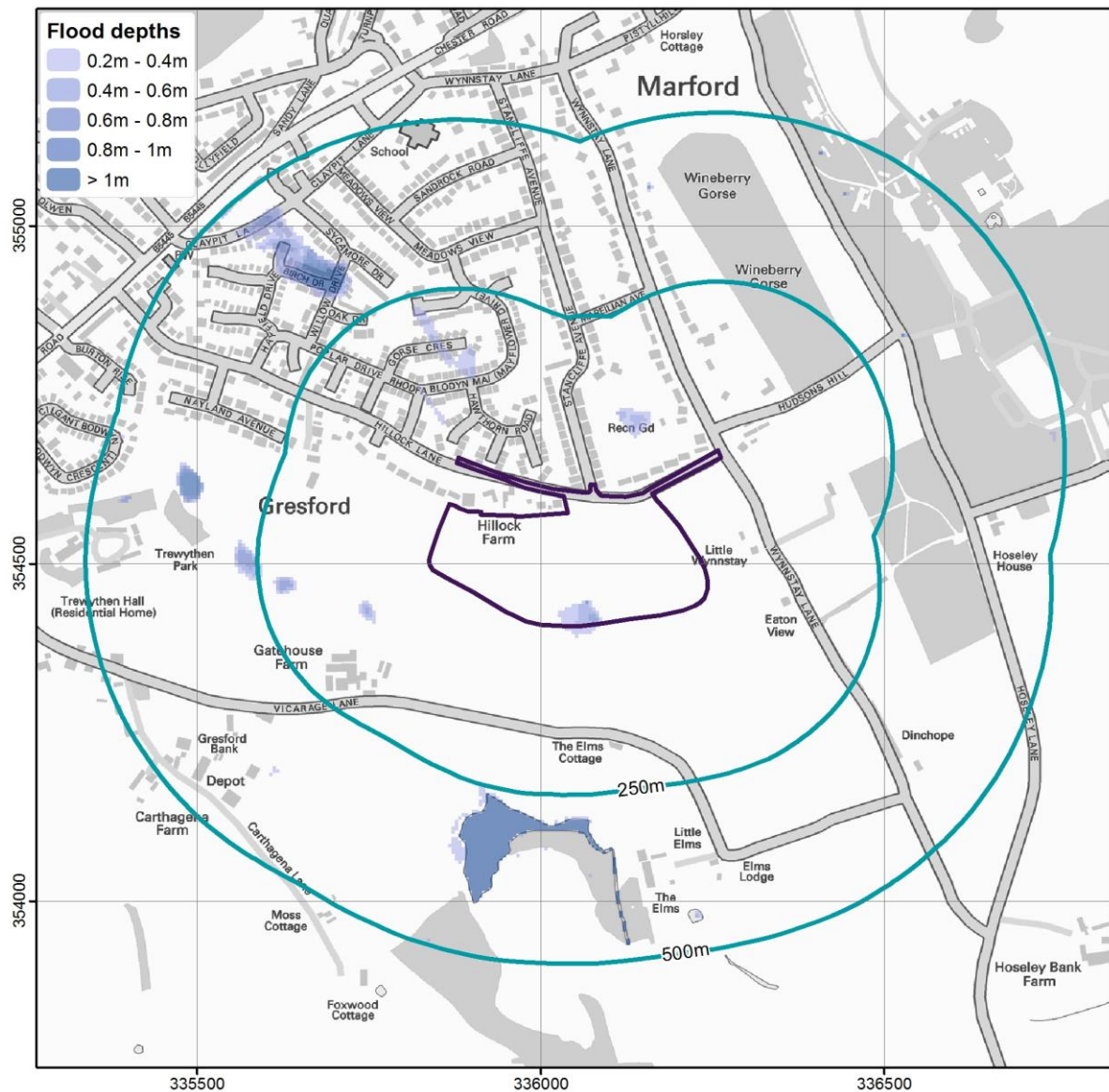
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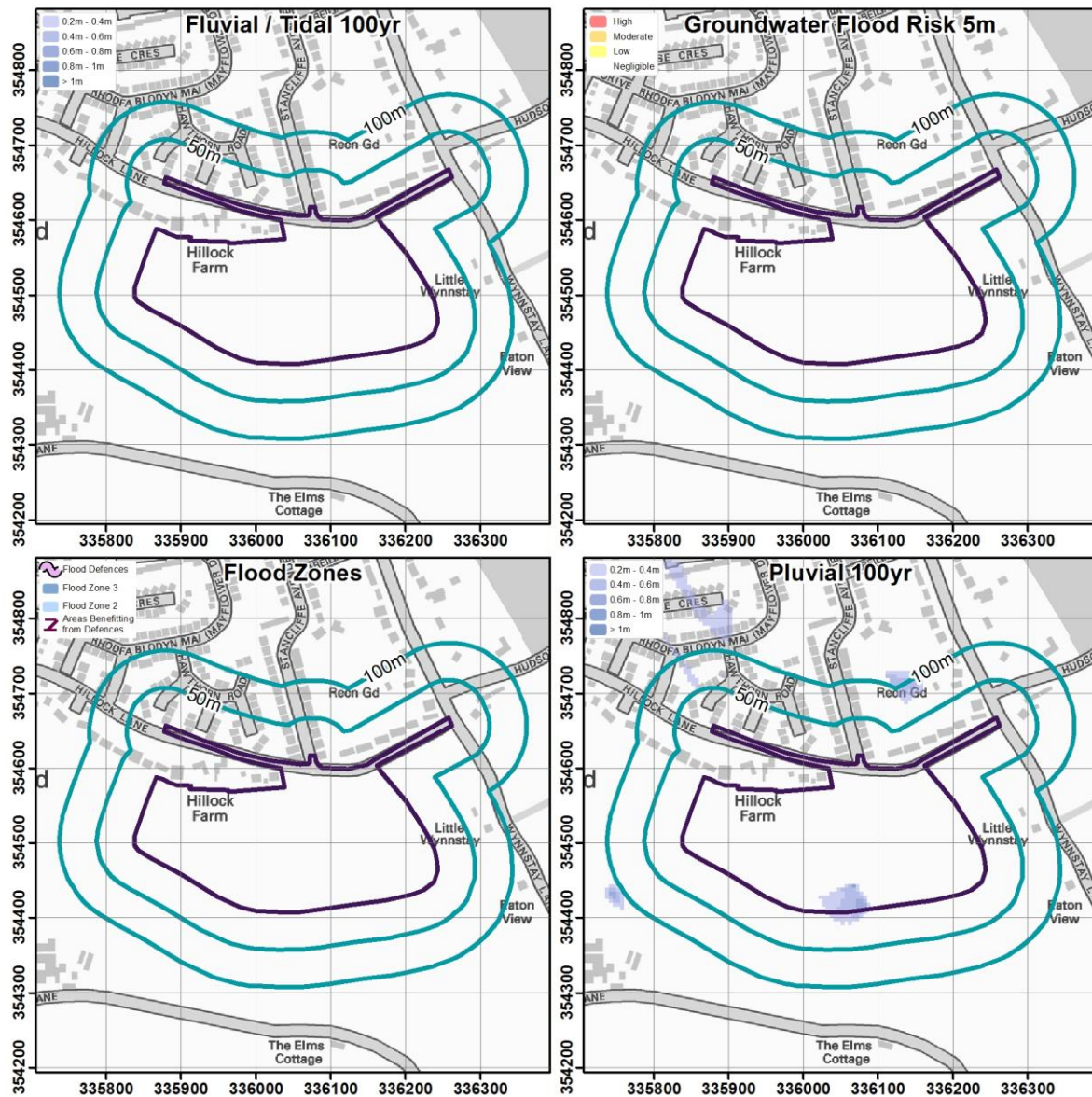
Contains Ordnance Survey data © Crown copyright and database right 2019
Contains Ambienta UKFloodMap4™ data 2019

UKFloodMap4™ Pluvial 1 in 100 year Pluvial Flood Depth Map (Ambiental, 2019)



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Contains Ambiental UKFloodMap4™ data 2019

Quad Map (NRW and Ambiental Data, 2019)



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 Contains Ambiental UKFloodMap4™ data 2018 / Natural Resources Wales copyright and database rights 2019

Appendix C

Natural Resources Wales LiDAR Elevation Data

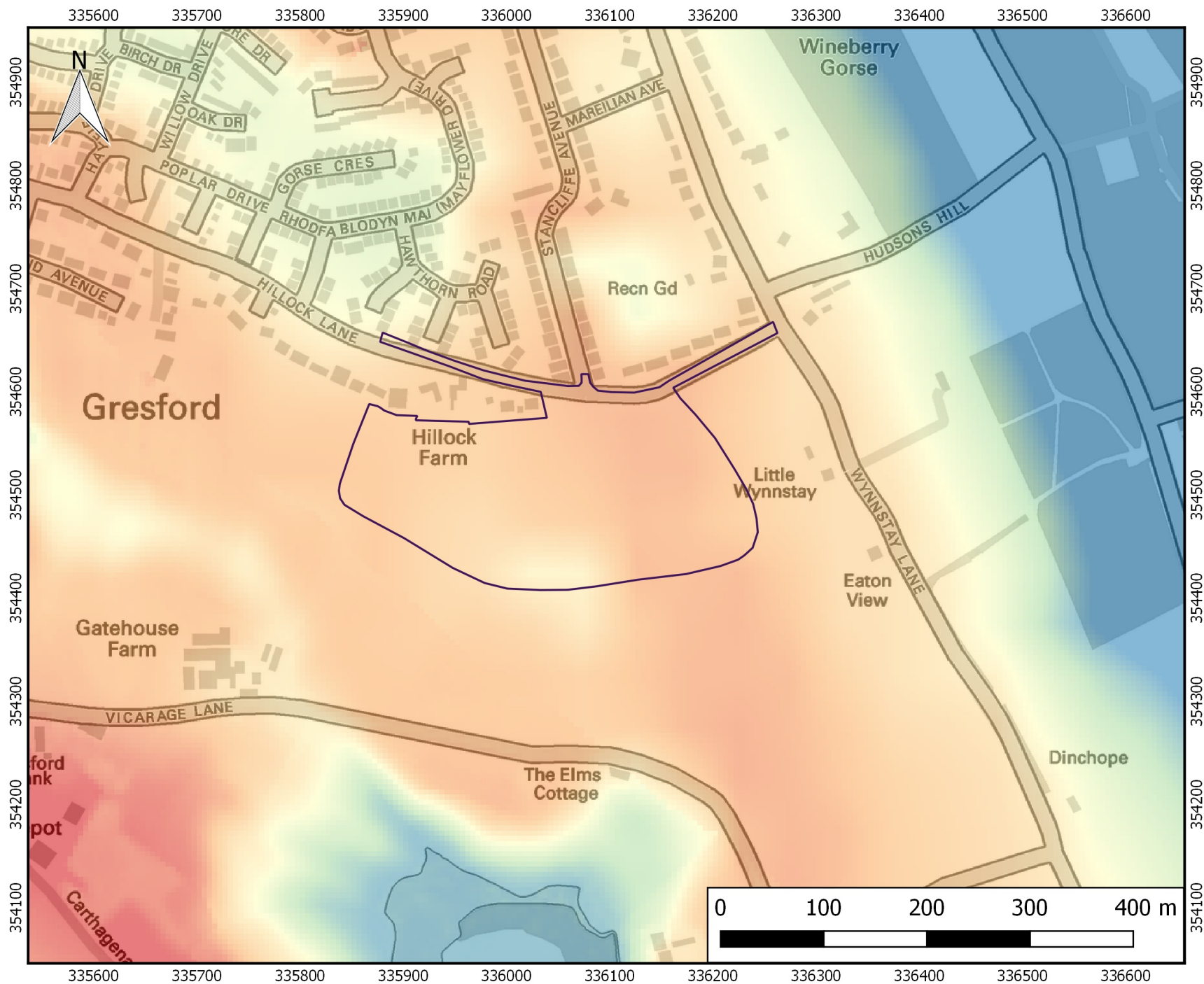
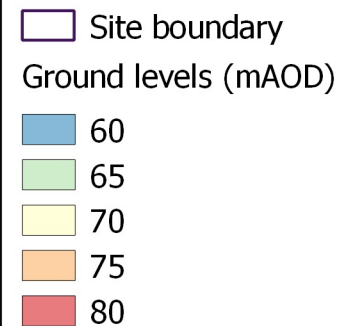


Figure D.1
Elevation on Site
(LIDAR Data)



Date 20/09/2019	Drawn
Scale 1:5,140	Checked
Original	Revision
File Reference	

Disclaimer

This report has been prepared by GeoSmart in its professional capacity as soil, groundwater, flood risk and drainage specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by GeoSmart solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to GeoSmart at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, GeoSmart may, by prior written agreement, agree to such release, provided that it is acknowledged that GeoSmart accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. GeoSmart accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against GeoSmart except as expressly agreed with GeoSmart in writing.

For full T&Cs see <http://geosmartinfo.co.uk/terms-conditions>

Important consumer protection information

This search has been produced by GeoSmart Information Limited, Suite 9-11, 1st Floor, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU.

Tel: 01743 298 100

Email: info@geosmartinfo.co.uk

GeoSmart Information Limited is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.
- By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme

(TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs contact details:

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

Please ask your search provider if you would like a copy of the search code

Complaints procedure

GeoSmart Information Limited is registered with the Property Codes Compliance Board as a subscriber to the Search Code. A key commitment under the Code is that firms will handle any complaints both speedily and fairly.

If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision.

Complaints should be sent to:

Jemma Prydderch - Operations Manager. **GeoSmart Information Limited, Suite 9-11, 1st Floor, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU**
jemma Prydderch@geosmartinfo.co.uk

Terms and Conditions

GEOSMART INFORMATION LIMITED
Conditions of contract for environmental reports

June 2016, Version 1.2

Definitions:

The following words shall have the following meaning:

- a) "Client" means the person for whom the Report has been procured either directly or through an Intermediary;
- b) "Conditions" means these terms and conditions of sale, the User Guide and the Order;
- c) "GEOSMART" means GeoSmart Information Ltd of Suite 9-11, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU, registered in England and Wales with company registration number 05475394.
- d) "Information" means environmental data, including other third-party sources of information;
- e) "Intermediary" means the party that places the Order acting on behalf of the Beneficiary, who might be a lawyer, consultant or other party;
- f) "Order" means the order for Services sent by a Client or an Intermediary to GEOSMART;
- g) "Report" or "Reports" means a report which relates to environmental information (as distinct from opinion) and which is prepared by GEOSMART in respect of a Site;
- h) "Services" means the preparation and provision of Report(s) by GEOSMART from the Information;
- i) "Site" shall mean the site specified in the Order;
- j) "User Guide" means the document (if any) which may be produced from time to time by GEOSMART entitled 'GeoSmart User Guide', which may be requested with the Report by writing to GEOSMART at the above address and will be provided if applicable.

1. Conditions

1.1 Subject to receipt of a valid Order, GEOSMART agrees to supply to the Client or the Intermediary (if the Client has appointed one) the Services subject to these Conditions and the Client or the Intermediary agrees that by placing an Order for the Services it accepts these Conditions. The User Guide applicable to each Report should be read in conjunction with the Report and is incorporated into these Conditions as if it were repeated herein. A Report is sold subject to all information contained in such User Guide

1.2 GEOSMART acknowledges that in the provision of the Report and Services it owes a duty of care to the Intermediary and to the Client.

1.3 In providing search reports and services GEOSMART will comply with Search Code and will take into account the requirements of the Alternative Dispute Resolution for Consumer Disputes (Amendment) Regulations 2015. Further details are provided in the PCCB

Bulletin which accompanies GEOSMART Reports.

2. Report

GEOSMART shall use reasonable care, skill and diligence in carrying out the Services and providing the Report to the Intermediary (and the Client). However, the Report is provided to the Intermediary (and the Client) on the express basis that the Intermediary (and the Client) acknowledge and agree to the following:

2.1 information and data supplied in Report(s) is derived from the Information and GEOSMART does not warrant the accuracy or completeness of such Information;

2.2 the sources of information and data supplied in Report(s) are specifically cited in the Report and the User Guide; however, GEOSMART does not claim that these sources represent an exhaustive or comprehensive list of all sources that could or might be consulted; and

2.3 GEOSMART does not guarantee that all environmental risks that are or might be associated with the Site will be identified in the Report; and

2.4 Reports and other services provided by GEOSMART are generally professional business to business services and intended as such for use or interpretation by professional persons skilled in the use of environmental information; and

2.5 GEOSMART shall not be responsible for any error or corruption in a Report resulting from inaccuracy or omission of third party information and data provided by the Intermediary or the Client (as applicable), inaccurate processing of information and data by third parties,

computer malfunction or corruption of data whilst in the course of conversion, coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link.

3. Liability

3.1 As some of the data and information which GEOSMART interprets in Reports is obtained by GEOSMART from third parties, GEOSMART cannot control the accuracy or completeness of such data and information, nor is it within the scope of the Services to verify the data or information by a physical inspection of the Site. Save as provided in Conditions 3.5 and 3.11 GEOSMART will only be liable to the Client or to the Intermediary in respect of the Services:

3.1.1 for loss or damage caused by breach by GEOSMART of these Conditions accordingly save as provided in Condition 3.5 GEOSMART shall not be liable in any other circumstances for any errors, inaccuracies, faults or omissions in the Services;

3.1.2 for any obvious errors or obvious inaccuracies in any information obtained by it where GEOSMART should reasonably have been alerted to such error or inaccuracy;

3.2 GEOSMART has no liability whatsoever for, under or in respect of any insurance policy purchased by the Client or the Intermediary where insurance is made available to the Client or Intermediary following the provision of a Report by GEOSMART issued in accordance with these Conditions. Where such a policy has been purchased, all liability arising from or relating to the Site shall remain exclusively with the insurers. Moreover, GEOSMART is

not endorsing any policy recommended by insurers and the Client or the Intermediary is entirely responsible for ensuring the insurance policy offered is suitable for its needs and should seek independent advice.

3.3 GEOSMART does not guarantee that an insurance policy will be available for the environmental risks that may be associated with the Site specified in the Report and the provision of a Report does not constitute any indication by GEOSMART that insurance will be available for the Site.

3.4 GEOSMART has undertaken the Services for use by the Client or the Intermediary and those persons referred to at condition 5.1 and 5.2 and for no other purpose whatsoever and the Services should not be relied upon by any other third party. GEOSMART cannot accept responsibility and will not be liable to any other party for any loss caused as a result of reliance upon the Services. Any other party relying on the Services does so entirely at its own risk, including without limitation, any insurers. Recipients of the Services are to rely on their own skill and judgment in determining the suitability of the Services for their own purpose and use.

3.5 Nothing in these Conditions shall exclude or restrict GEOSMART's liability for death or personal injury resulting from the negligence of GEOSMART or their employees while acting in the course of their employment or arising from a breach of its statutory duty or fraud.

3.6 GEOSMART shall not be liable to any recipient of the Service for loss of profits, loss of contracts, (or other indirect or consequential loss or damage) resulting

from any event or default by GEOSMART in the provision of the Services to the fullest extent permitted by law.

3.7 GEOSMART shall make reasonable endeavors to supply the Report on the date agreed with the Intermediary or the Client (as applicable). This date will be taken as a guideline for time planning purposes only. Time shall not be of the essence with respect to the provision of the Services except where it has agreed in writing to a deadline with the Client or Intermediary in which it is stated that time is of the essence.

3.8 GEOSMART shall not be liable for any delay, interruption or failure in performance of its obligations hereunder which is caused by war, flood, riot, Act of God, strike or other labour dispute (including those affecting Government officials), suspension or delay of service at public registries, lack of power, telecommunications failure or overload, or computer malfunction caused by any event beyond the reasonable control of GEOSMART.

3.9 The Client or the Intermediary (as appropriate) shall on receipt of the Services make a reasonable inspection of the Site to satisfy itself that there are no apparent defects or failures with respect to the description of the Site.

3.10 GEOSMART's liability under the Conditions shall cease upon the expiry of six (6) years from the date when the Client, Intermediary or any person making use of the Report in accordance with Condition 5.2 became aware that it may have a claim in respect of a particular Report provided always that there shall be no liability at the expiration of six (6) years from the date of the Report. For the

avoidance of doubt, any claims in respect of which proceedings are notified to GEOSMART prior to the expiry of the time periods referred to in this Condition shall survive the expiry of those time periods.

3.11 Subject as otherwise provided in these Conditions, GEOSMART's aggregate liability arising out of the provision or use of the Services, in contract, negligence or in any other way, for damages or loss sustained or incurred by the Intermediary shall be limited to an aggregate amount not exceeding £5,000,000 pounds. For the avoidance of doubt, if multiple parties make use of the Report, the limit referred to above applies to all users of that Report in aggregate.

3.12 GEOSMART undertakes for the duration of the six (6) year period of liability provided for by Condition 3.11 to maintain and renew annually Professional Indemnity Insurance in respect of the Services with a liability limit of not less than £5,000,000 provided that such insurance is available at commercially reasonable rates (and in such case then at the next highest limit which is available in the market at commercially reasonable rates). Details of Professional Indemnity Insurance shall be made available to the Client or Intermediary (as applicable) on request.

3.13 Where GEOSMART procures for the Intermediary, otherwise than as part of a Report, any third-party service, including but not limited to, environmental reports, risk models, risk assessments, professional opinions, or any other service, GEOSMART accepts no liability whatsoever for the information contained therein.

3.14 The Client and the Intermediary warrant that they shall: (i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010; (ii) comply with such of GEOSMART'S anti-bribery and anti-corruption policies as are notified to them from time to time; and (iii) promptly report to GEOSMART any request or demand for any undue financial or other advantage of any kind received by the or on their behalf in connection with these Conditions. Breach of this clause shall be deemed a material breach of these Conditions.

4. Copyright

4.1 The Intermediary, the Client and any recipient of the Report pursuant to the provisions of condition 5.2 acknowledge that the proprietary rights subsisting in copyright, design rights and any other intellectual property rights in respect of the data and information in the Report are and shall remain the property of GEOSMART and these Conditions do not purport to grant, assign, or transfer any such rights in respect thereof.

4.2 Reports may be stored on the Intermediary's server and used on up to ten (10) units (where a "Unit" means a single client personal computer or workstation) on the Intermediary's network and any network of a recipient of the Report pursuant to the provisions of Condition 5.2. Data in Reports is deemed to be in use when it is loaded into the temporary memory (i.e. RAM) or installed onto the permanent memory (i.e. memory chip, hard disc, CDROM) of that computer.

4.3 The Intermediary, the Client and all recipients of the Report pursuant to the provisions of Condition 5.2 are all entitled

to make up to five printed copies only of any Report. Copies of the Report may be provided for information purposes for proper and lawful use only to a person who is considering whether to acquire or hold an interest in the Site or to provide funding in relation to the Site. Further copies may not be made in whole or in part without the written permission of GEOSMART who shall be entitled to make a charge for each additional copy.

4.4 The Intermediary and the Client (as applicable) shall (and shall procure that all recipients of the Report pursuant to the provisions of Condition 5.2 shall):

4.4.1 not remove, suppress or modify any trademark, copyright or other proprietary marking belonging to GEOSMART from the Services;

4.4.2 not create any product which is derived directly or indirectly from the data contained in the Services; save for products documents and advice provided by those acting in a professional or commercial capacity in accordance with 5.2.3;

4.4.3 not combine the Services with or incorporate such Services into any other information data or service;

4.4.4 not re-format or otherwise change (whether by modification, addition or enhancement) data contained in the Services save for those modifications made by those acting in a professional or commercial capacity in accordance with 5.2.3;

4.5 The mapping (if any) contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services.

5. Confidentiality and reliance

5.1 Subject to (i) full payment of all relevant Fees and (ii) compliance with this Contract, the Client or the Intermediary is entitled to rely on the report and information provided.

5.2 Subject to Condition 5.3, the Client or the Intermediary (as applicable) may without further charge make the Report available to:

5.2.1 Up to a maximum of three (3) persons who acquire or hold an interest in the Site or an interest in the Client or the entity which holds or acquires an interest in the Site save that nothing shall hereby entitle any such person to recover twice (whether directly or indirectly) in respect of the same loss nor seek recovery in respect of any loss relating to any period after such entity ceases to hold its interest or to have potential liability for the Site (whichever is the later) (unless otherwise agreed by the parties);

5.2.2 Up to a maximum of three (3) persons who provide funding to the Client or to a person at condition 5.2.3;

5.2.3 Up to a maximum of three (3) persons acting in a professional or commercial capacity for the Client in relation to the Site.

5.3 GEOSMART shall have the same duties and obligations to those persons referred to in Conditions 5.2.1, 5.2.2, 5.2.3 in respect of the Services as it has to the Client and the Intermediary, and such persons shall be entitled to rely on the relevant Report as if it was addressed to them and any such person shall be entitled to enforce each of these Conditions as if they were named as joint Client in the Order, provided always that

the person to whom the Report is made available accepts these Conditions by writing accordingly to GEOSMART citing the Report and the Site.

5.3 The Report is to be used solely for the benefit of such persons as are set out in Condition 5.1 and 5.2, and GEOSMART exclude all liability to all other persons unless GEOSMART has expressly agreed in writing to a third party taking the benefit of the Report and has been paid reasonable fees for so doing.

5.4 Any information provided by the Intermediary or the Client to GEOSMART in contemplation of the Services to be provided together with the Report will be treated as confidential information.

5.5 GEOSMART agrees not to disclose or publish any statement relating to such confidential information (in whole or in part) to any third party without the prior written consent of the Intermediary save for its provision to GEOSMART's employees who require access to the confidential information in order to perform their duties to GEOSMART.

5.6 GEOSMART will procure that its employees will maintain the confidential information in strict confidence.

6. GEOSMART's charges

6.1 The Client or the Intermediary (as applicable) shall pay GEOSMART's charges for the Services at the rate set out in the Order.

6.2. Unless otherwise stated all prices are exclusive of Value Added Tax which shall, where applicable, be payable in addition to any sum payable for the Services at the relevant rate in force from time to time,

against delivery of an appropriate tax invoice.

6.3 The Client or the Intermediary (as applicable) shall pay the price referred to in Condition 6.1 above for the Services:

6.3.1 without any set off, deduction or counterclaim;

6.3.2 GEOSMART requests upfront payment by debit or credit card (No surcharges for credit cards) or by bank transfer. A credit agreement can be set up for repeat clients with terms based on 14 days from the date of GEOSMART's invoice.

6.4 GEOSMART shall not be obliged to invoice any party other than the Client or the Intermediary (as applicable) for the provision of Services, but where GEOSMART does so invoice any third party at the written request of the Client Intermediary, and such invoice is not accepted or remains unpaid, GEOSMART shall have the right at any time to cancel such invoice and invoice the Client or the Intermediary (as applicable) direct for such Services. Where the Intermediary's order comprises a number of Services or separate elements within any one or more Services, any failure by GEOSMART to provide an element or elements of the Services shall not prejudice GEOSMART's ability to require payment in respect of the other Services delivered to the Intermediary or the Client (as applicable).

6.5 If the Intermediary or the Client (as applicable) fails to make any payment on the due date GEOSMART shall be entitled to cancel or suspend any further orders or delivery. In addition, GEOSMART may charge the Intermediary or the Client (as applicable) interest on overdue amounts at 4% over the NatWest plc base rate (as

varied from time to time) from the due date until payment in full is made (whether before or after judgment).

7. General

7.1 These Conditions constitute the entire agreement between the parties and no statement given orally or in writing should be deemed incorporated herein unless executed in writing by a director of GEOSMART and countersigned by the Intermediary or the Client (as applicable). Each of the Conditions and Sub-conditions of these Conditions is distinct and severable. If any provision of these Conditions shall be determined to be invalid, illegal or unenforceable, the remainder of these Conditions shall continue to be valid, legal and enforceable to the fullest extent of the law.

7.2 Any time or indulgence granted by GEOSMART or the Client or the Intermediary or delay in exercising any of its rights under these Conditions shall not prejudice or affect GEOSMART's or the Client's or the Intermediary's rights or operate as a waiver of the same.

7.3 GEOSMART, the Client and the Intermediary shall not be entitled to assign their respective rights or obligations pursuant to these Conditions without the prior written approval of the other parties.

7.4 GEOSMART may suspend or terminate the provision of the Services if the Client

or the Intermediary (as applicable) is bankrupt or insolvent or makes any voluntary arrangements with its creditors or become subject to an administration order or has an administrative receiver appointed over any of its assets or GEOSMART has reason to believe that any of foregoing circumstances may come into existence or any amount owing to GEOSMART that is overdue or where the Client or Intermediary (as applicable) has exceeded any credit limit.

7.5 These Conditions shall at all times be governed construed and enforced in accordance with English Law which shall be the proper law of these Conditions, and both parties thereby submit to the exclusive jurisdiction of the English courts.

7.6 Except as otherwise provided in these Conditions a person who is not a party to any contract made pursuant to these Conditions shall have no right under the Contracts (Rights of Third Parties) Act 1999 to enforce any terms of such contract and GEOSMART shall not be liable to any such third party in respect of the Products.