



argyll
environmental®

Flood Solutions Products and services - user manual

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Intelligent Due Diligence and Risk Management



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Appendix 1 - Datasets Currently Used in Argyll **FLOODSOLUTIONS** Reports



1. Introduction

1.1. About us

Argyll Environmental Ltd (Argyll) provides contaminated land and flood risk assessments, reports and consultancy services to legal, financial and property professionals.

We recognise that every site and project is unique, so we provide a 'one stop shop' for our clients to cover all aspects of flood risk management - from initial desktop flood risk screening (**FLOODSolutions** reports) through to detailed Flood Risk Assessments (FRA's). We help to devise ways to manage or reduce flood risk. Our services are quick and cost effective and are supported by a technical helpline and after-hours support from experienced consultants.

All our reports are designed by experts and use the best available data. Our products and services are supported by comprehensive professional indemnity insurance and flexible Terms & Conditions.

1.2. Why do you need a flood report?

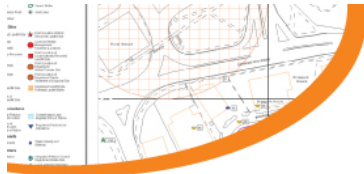
Climate change is likely to increase the intensity and frequency of flooding. This will have an impact on property owners and occupiers for several reasons: the potential for disruption and cost of repair, the impact on insurability against flood risk, the effect of insurance availability on mortgages and thus on value, and the greater scrutiny of the effect on flood risk management of prospective development.

For all these reasons, it is increasingly prudent to include an accurate assessment of flood risk in the due diligence process. In due course, lenders may make such an assessment compulsory.

It is important to choose a flood risk report that includes an accurate and practical assessment of the risk from surface water flooding. This has only recently been recognised as a major cause of flooding. It can occur considerable distances from an obvious water feature; normal flood defences do not offer protection from it and the Environment Agency flood information available to the public does not include surface water flood risk. **FLOODSolutions** reports all assess very detailed surface water flooding information from JBA Consulting Ltd (JBA).

Insurers are gaining access to this type of information on surface water flood risk. This is likely to have an effect on the availability and cost of flood insurance, as a component of comprehensive buildings insurance. Following the 2008 Pitt Report (set up to report on the extensive 2007 flooding), the Council of Mortgage Lenders commented: "if (flood) insurance is not available, then it is unlikely that a property will be mortgageable". Without access to a mortgage, a site may be difficult to sell, and this will affect its value. **FLOODSolutions** reports provide clear guidance on the availability of insurance against flood risk at normal rates.

Flood risk also has a direct influence on the potential to redevelop a site. Planning Policy Statement Note 25 (PPS25) 'Development and Flood Risk' states that "all forms of flooding and their impact on the natural and built environment are material planning considerations". For areas within Flood Zone 2 or 3 (as defined by the Environment Agency) any proposed planning applications have to be accompanied by an FRA. The scope of this has to be agreed with the Environment Agency and the Local Authority. Without such an FRA the planning application is likely to be refused. Sites outside Flood Zone 2, but within other flood prone areas or above a threshold size (1 hectare) may also



require an FRA. If the Local Authority requires follow up work (on flood risk assessment or control) then Argyll can assist.

So, if your business deals with financing or acquiring property or land, or you provide legal advice to such clients, one of the Argyll **FLOODSolutions** reports can help you and your client identify and manage flood risk.

1.3. Our data

Argyll aims to provide best quality information in its reports at competitive rates.

Our data is sourced from a range of suppliers and has been carefully selected so that all our reports cover the following flood risks: coastal, fluvial (river), groundwater and pluvial (surface water). **FLOODSolutions Commercial** covers additional risks. Data update cycles ensure that we use the most up to date information. More information on the datasets used in our reports and the relevant update cycles is set out in Appendix I to this user guide.

In some cases the design of datasets means the information they provide is not site-specific, but instead relates to the general area where the site is located. Some datasets are less robust or comprehensive than others. More information on this is contained in the relevant Remarks section of Appendix I to this user guide.

Whilst every effort is made to check and quality assure the data in our reports, because it comes from external providers and covers a very wide range of detailed spatial information, Argyll cannot guarantee the accuracy or completeness of such data or information.

1.4. Our consultants and commercial partners

The data in **FLOODSolutions Commercial** and Consult reports is analysed by one of our team of trained consultants, all with experience of risk assessment, including the facilitation of FRA's and Sustainable Urban Drainage Systems (SUDS). All are accredited to professional environmental organisations such as the Institute of Environmental Management and Assessment (IEMA), the Chartered Institute of Water and Environmental Management (CIWEM) and the Institution of Environmental Sciences (IES). Each consultant is subject to continual review and an ongoing professional development programme.

Argyll also has access to a panel of expert advisers and associates and an in-house lawyer to provide legal support. CVs for Argyll staff can be provided on request.

For our more complex reports and certainly for Flood Risk Assessments, we work closely with JBA and other expert consultancies. They have considerable experience, both in the UK and abroad, and have developed in-depth knowledge of water supply, navigation, irrigation, flood risk assessment, flood management, flood warning and flood incident management, modeling and systems analysis. They regularly work with the Environment Agency, who have taken a licence to use their surface water flood risk model, in order to underpin the emergency planning response of Local Authorities and central Government agencies.



JBA was founded in 1995 and is one of the UK's leading specialists in flood risk and environmental management. JBA are innovative in both their technical knowledge and offer competitive pricing with the highest quality standards. JBA remain at the forefront of their industry, frequently being assessed as one of the leading flood risk consultants and regularly working with the Environment Agency both in the provision of data, modeling and technical support. Their services include specialist water management, engineering solutions, software development, integrated planning solutions and risk management.

1.5. Recommended period of use

As data is constantly updated, we recommend that reports more than six months old are updated before a decision is made on whether to buy or take security over a property based on the results of those reports.

1.6. Terms and conditions

Our Terms and Conditions have been carefully designed with the client in mind.

All **FLOODSolutions** reports are governed by the Argyll Terms and Conditions for **FLOODSolutions**. These provide £10,000,000 of liability cover per report. FRAs are supplied under the JBA terms and conditions.

1.7. Reliance

Argyll's Terms and Conditions for **FLOODSolutions** reports have been designed to give great flexibility on the number of parties who can rely upon the reports. Clause 5 'Confidentiality and Reliance' defines these parties (for example the purchaser, funder and their professional advisors).

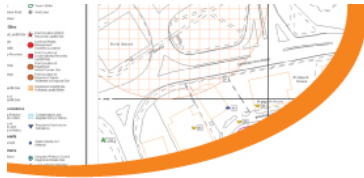
Argyll can also provide Reliance Letters upon request. There is normally a small charge for this service to cover our administration costs. Requests for a Reliance Letter should be addressed to our Legal Director. To enable us to deal with your request quickly, please send through:

- The name and address of the person who requires the Reliance Letter;
- The capacity (e.g. purchaser, lender) in which they will have an interest in the site;
- The name and address (if different from above) to whom the Reliance Letter should be sent.

2. How Argyll assess flood risk

2.1. Sources of flooding

There are four main sources of flooding, all of which are assessed in Argyll's **FloodSolutions** reports.



2.1.1. River

River flooding mainly happens when the river catchment (that is the area of land that feeds water into the river and the streams that flow into the main river) receives greater than usual amounts of water (for example through rainfall or melting snow). The amount of runoff depends on the soil type, catchment steepness, drainage characteristics, agriculture and urbanisation as well as the saturation of the catchment. The extra water causes the level of the water in the river to rise above its banks or retaining structures. This flooding may take place at any point along the river course and not necessarily at the place where the extra water has entered. In upland rivers, the flooding is usually temporary. The river capacity is increased by overland flow along the flood plain as well as the increased depth of the main channel, and the flood begins to subside as soon as the peak runoff has passed. More prolonged flooding can occur in lowland rivers, where the gradient is much flatter, possibly only a few inches per mile. There, downstream flooding can prevent drainage of areas upstream, leading to ponding of the water discharging from higher up the catchment in the flood plain.

2.1.2. Coastal

Coastal flooding is caused by the inundation of land areas along the coast due to sea water rising above normal tidal conditions. Coastal flooding can arise from a combination of high tides, wind induced tidal surge, storm surge created by low pressure and wave action. There is also the likelihood of a general rise in sea level caused by climate change.

2.1.3. Groundwater

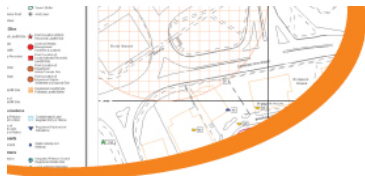
Ground water flooding occurs when ground water levels increase sufficiently for the water table to intersect the ground surface. Ground water flooding can occur in a variety of geological settings including valleys in areas underlain by chalk, and in river valleys with thick deposits of alluvium and river gravels. Contributing factors include a combination of already high ground water levels (usually during mid or late-winter) and intense or unusually lengthy rainfall periods. Ground water flooding may last for weeks or months - often much longer than flooding caused by a river or coastal sources.

2.1.4. Surface water

Surface (pluvial) flooding results from rainfall running over ground before entering a watercourse or sewer. It is usually associated with high intensity rainfall (typically greater than 30mm per hour) but can also occur with lower intensity rainfall or melting snow where the ground is already saturated, frozen, developed (for example in an urban setting) or otherwise has low permeability. This type of flooding results in overland flow and ponding in depressions in the topography.

Our reports do not make a detailed site-specific assessment of the suitability of the existing drainage on the Site. If this is required, then a site survey should be considered. The assessment of pluvial flooding does not take into account particular local or temporary factors that may cause surface water flooding such as the blockage or failure of structures on or within watercourses, drains, foul sewers, water mains, canals and other water infrastructure; and any history of drains flooding at the Site or in the locality. Pluvial (surface water) flooding can occur before surface water reaches the general drainage network, for example on hills and inclines.

Sewer flooding occurs where the sewerage system capacity is inadequate to deal with the quantity of water or effluent entering the sewer. Modern storm water sewers are designed to cope, without



surcharging, with the sort of storm that occurs twice a year, and not to cause flooding where the storm is of the higher intensity that might be expected once in 30 years. Older sewers are generally constructed to a lower standard and combine the drainage of both storm and foul water. Older sewers were generally constructed with Combined Sewer Overflow structures (CSO). This means that, when they flood, this type of sewer discharges water contaminated with sewage, not just clean rainwater. The Urban Wastewater Treatment Directive issued by the EU in 1991 has directed that these overflows should be eliminated where possible, and the spill frequency of those that remain should be reduced.

This means that either the capacity of the sewers must be increased, or additional storage must be provided within the sewerage network. England and Wales has a legacy of sewers, particularly in the densely urbanised regions, designed many years ago to lower standards and which have been progressively overloaded by continuing development in the upstream catchment areas, as towns have expanded.

2.1.5. Other flood risks

FLOODSolutions Commercial analyses additional data on the risk from flooding from nearby dams or reservoirs, and any previous recorded episodes of sewer flooding that may have affected the site. The latter data (which comes from the “At Risk” register which should be maintained by the local water and sewerage provider) can be very inaccurate. Not all providers will release the information; the registers need only record episodes of flooding due to sewer overflow or failure in the last 2-5 years; and they may not record those episodes on a property by property basis. Instead the entry may be for a group of houses all served by the sewer which overflowed.

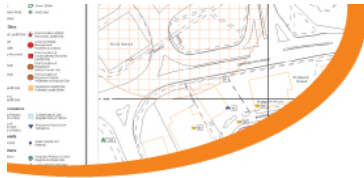
2.1.6. Flood defences

Most types of flooding can be defended to some degree. Such defences include large scale defences such as embankments and the Thames Barrier (usually maintained by the Environment Agency), or small scale site-specific defences such as impermeable membranes, tanking systems, temporary barriers and air-brick covers. Large scale defences are usually better at protecting against river and coastal flooding, where-as small scale defences are better at protecting against surface water and groundwater flooding.

When considering defended and undefended flood risks in our reports, Argyll relies upon information on large scale defences provided by the Environment Agency. There is currently no site specific data on small scale defences. Accordingly we are only able to comment on how river and coastal flooding may be mitigated by any defences present.

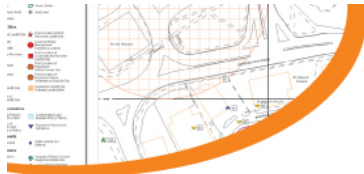
2.2. The datasets used by Argyll

Argyll uses a range of data from leading agencies, including the Environment Agency, the British Geological Survey, Ordnance Survey and JBA Consulting Ltd. Details of each dataset, its purpose, scope and potential drawbacks are given in the Appendix to this user guide, but a summary of the main sources is provided below.



2.2.1. Environment Agency data

Dataset	Overview
The Detailed River Network (DRN)	This data was derived from Ordnance Survey Mastermap (the UK's most detailed digital mapping) and shows the centre-lines of the river network (rivers, drains and streams) in England and Wales. Where relevant, it assigns attributes such as river type and designation (i.e. Main River status). It can be important to know this because certain statutory bodies must be consulted about development proposals near to a Main River, canal or drainage channel.
Flood Zone 2 – areas at risk of river and coastal flooding in extreme circumstances	Applicable to England (and in a different way to Wales). It shows the areas vulnerable to a flood (whether from the sea or from a river) which has a 0.1% (or more) chance of happening in any one year (but a less than 1% chance of such flooding from rivers). It assesses this as if there were no flood defences in place.
Flood Zone 3 – areas at risk of river and coastal flooding in less extreme circumstances	Applicable to England (and in a different way to Wales). It shows the areas vulnerable to a flood from the sea which has a 0.5% (or more) chance of happening in any one year or to a flood from rivers which has a 1% (or more) chance of happening in any one year. It assesses this as if there were no flood defences in place.
Flood Defences	This data highlights the locations of embankments, walls, weirs, sluices and pumping stations. In theory it records only those defences built in the last 5 years to a standard that should protect against the same intensity of flooding as is used to plot Flood Zone 3 (see above). In practice it may also include details of some older defences, or those that offer a lower standard of flood protection, for example, Victorian levees and embankments. Records of these will not be comprehensive.
Defended Areas	This data plots the areas which benefit from the flood defences which the flood defence dataset records, and which would be flooded, were those defences not in place.
Flood Storage Areas	These may be balancing reservoirs, balancing ponds or storage basins. All are designed to hold flood water for a period so that it can be gradually released downstream, hopefully reducing the impact of flood water lower down the river or drainage channel.
Historic Events	This is the record held by the Environment Agency of the location, date and extent of actual past floods. It is not comprehensive.
National Flood Risk Assessment (NaFRA)	The Environment Agency uses its data to make its own assessment of the risk of river or coastal flooding to the areas of land within Flood Zones 2 and 3. It was originally invented as a guide to where flood defences were most needed. The risk assessment takes into account a variety of hypothetical levels of rainfall or coastal flooding (both in terms of intensity and duration) and any flood defences that are in place, which it assumes will work effectively. It looks at the data for grid squares that are 50m ² in extent and assigns a risk level (either low, moderate or significant) for the whole square. It cannot differentiate between properties within the grid square (perhaps on



Dataset	Overview
	<p>grounds of relative height). Nor does it predict the depth of resultant flooding (merely the risk of flooding occurring at all). NARA data does not include flood risk from very small catchments as models of such small scale catchments are not considered to be reliable for UK-wide flood risk assessments. The potential impact of climate change on flood risk to the Site would require further study.</p> <p>The assessment is regularly updated by the Environment Agency and Argyll use the latest version, which is NaFRA 2008. Many insurers use NaFRA as a guide to where to offer flood risk insurance cover.</p>

2.2.2. British Geological Survey (BGS) data

BGS publish two datasets, one on the susceptibility to ground water flooding and the other on the geological indicators of flooding which may have occurred in the past.

Their assessment of susceptibility to ground water flooding is based on identifying the location of those areas where geological conditions and local hydro-geological information suggest that ground water flooding could occur. This is plotted on 50m² grid squares and the levels of risk assigned range from negligible through to high susceptibility. It is a hazard dataset not a risk dataset, in that it records where the conditions are suitable for ground water flooding but not how often it might occur or has occurred. Some caution needs to be applied to the interpretation of this data.

The dataset which records geological indicators of flooding merely identifies the location of those types of superficial geological deposits which occur as a result of flooding. This might suggest there has been flooding in 'recent' geological terms, and thus that flooding might occur again given suitable conditions. However, recent, in geological terms, can mean thousands of years ago. Caution is therefore needed when reviewing this data.

2.2.3. JBA data

JBA provides the most accurate surface water flood risk data in England and Wales. They have invented a digital terrain model onto which they plot a particular rainfall event (designating the length and intensity of the rainfall). The model then predicts where the water will travel and pond (assuming the drains are overwhelmed by the water). This takes into account relative heights, topography, and natural flow channels. A very small scale grid system (only 5m² squares) means that the model can assess the level of potential surface water flooding on a property-specific basis. Unlike NaFRA (for river and coastal flooding) the JBA model can predict the level of likely surface water flooding in those small grid squares. JBA assign this to one of four levels: negligible (under 0.1m depth), low (0.1-0.3m depth); medium (0.3-1m depth) and high (over 1m).

2.2.4. Ordnance Survey data

The Ordnance Survey (OS) is the leading provider of mapping in the United Kingdom (UK). They have mapped the whole of England, Scotland and Wales at 1:1,250 scale in digital format. This very detailed dataset is known as Mastermap. Each feature has an attribute telling the user what the feature is (house, road, water feature etc.). This allows Argyll to extract information on features that might be a source of flooding (e.g. streams, rivers, lakes). The proximity to such water features can then be included in a report.



In addition to surface water features, the OS also provides information on the height of the land surface above sea level. This dataset is called Landform Profile, where information can be reported via contours laid on a map or using spot heights. Argyll uses this information to calculate the average height of a property above sea level, as well as relative heights of surrounding features. This information can then be used to provide a more accurate risk assessment.

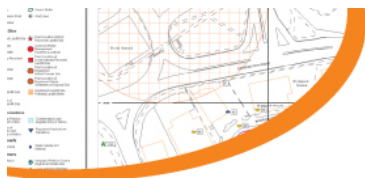
All spatial information needs to be put in context and therefore Argyll uses two types of OS mapping to display data in its reports. For a very detailed view, Mastermap is used. For a more general view StreetView is used.

2.3. The Argyll assessment

Argyll looks at the information from all the datasets used in the relevant report and forms its own qualitative assessment as to the overall risk from river, coastal, groundwater and surface water flooding. When looking at this information, Argyll may consider it appropriate to alter the risk assessment applied in an individual dataset by its supplier. For example, the BGS groundwater dataset may disclose a very high susceptibility to groundwater flooding. However, by looking at detailed geological maps, the relative height of the site above sea level and infrastructure at the site (presence of cellars/basements etc.) we may downgrade the overall groundwater risk.

We assess the overall risk for each type of flooding using a 6-point scale (ranging from negligible to high). This is represented in pictorial form in the flood gauges at the start of each report. The flood gauges present the risk of flooding from each of the sources of flooding. If no defences are present (that are known to the Environment Agency) and which could protect the Site, then the gauges take these into account. The description of each risk level is set out in the following table:

Risk Level	Meaning
Negligible	The data does not indicate any risk at the site itself, or any feature within the locality of the site, which would be expected to pose a threat of flooding. Argyll does not consider it necessary to make any further investigations into flood risk.
Low	The data suggests that the overall risk to the site is low and Argyll does not consider it necessary to make any further investigations into flood risk. If the site is large (over 1 ha) it would require a Drainage Impact Assessment to accompany any planning application.
Low to Moderate	The data suggests that the overall flood risk to the site is low to moderate. For example, flood storage areas or watercourses near the site may pose a risk of flooding. Further investigations could be undertaken to further assess the risk such features pose.
Moderate	The data indicates that overall flood risk to the site is moderate. Argyll would normally suggest that further investigations to clarify the risk of flooding would be prudent.
Moderate to High	The data suggests that there are certain features which may present a significant risk to the site and its occupants from flooding. Argyll would normally suggest further investigations in order to clarify the risk of flooding at the site.
High	Here the data indicates that the overall flood risk to the site is assessed as high, with a consequent risk to life and property. The flood risk issues will need to be addressed. Further assessment is recommended in order to clarify the risk of flooding at the site.



2.4. The key questions

Argyll applies their overall assessment of the data to answer key questions.

2.4.1. Is the site likely to be insurable at standard terms?

The insurance industry uses particular criteria, and often consistent information and data, to underpin its assessment of flood risk and insurability (whether that is the likely cost of flood insurance or its availability at all). Argyll applies similar criteria to its assessment of the data in order to form a view of whether flood risk insurance will be available at standard terms (or whether the risk to this site is such that the owner might expect insurance to be more difficult to obtain, or that the insurer will impose additional excesses or enhanced premiums). As the insurers' standards change, so will Argyll's assessment of this issue.

2.4.2. If development is proposed, would a detailed Flood Risk Assessment be required?

This will depend on the flood risks that apply to the site and the local area. In very general terms, under PPS25 development is discouraged in areas prone to flooding, or in a manner that might exacerbate flooding risk to others. For the planning authority to make an informed decision on such matters, they require the applicant to produce an FRA as part of the application. The content of an FRA can be very wide ranging, and its scope must be agreed in advance with both the planning authority and the Environment Agency. They can be very time consuming and expensive to produce.

2.4.3. What is the overall risk of flooding, assuming defences fail or are absent or overtopped?

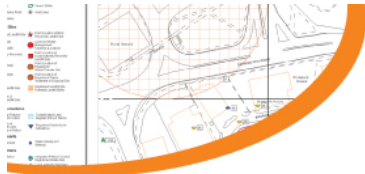
This question is answered on the assumption that there are either no flood defences from which the site could benefit, that any such defences could fail or that the scale of the flooding might exceed the height of the defences.

2.4.4. Are there existing flood defences that might benefit the Site?

To answer this question, we check for flood defences and areas benefiting from flood defences within a defined distance from the Site (500m for **FloodSolutions** Commercial and Brief and 250m for **FloodSolutions** residence reports). Such defences could therefore protect a site against river and coastal flooding and include embankments, revetments, earth bunds or stone walls. Not all flood defences have the areas which they protect mapped, therefore it is not possible to be certain whether a particular defence provides protection to a particular property.

2.4.5. What is the risk of flooding when these defences are operational?

Where the answer to the question posed in section 2.4.4 is positive (YES), then Argyll provides an assessment of the risk of flooding taking into account those flood defences.



3. The Range of Argyll Flood Reports

Argyll offers three main types of report commonly used by consultants when managing flood risk.

3.1. Flood risk screening reports

These are desktop screening reports. There is no site visit. All offer assessment of the risks from the four main sources of flooding and **FLOODSolutions Commercial** also looks at flood risk from dams or reservoirs failing and from sewer flooding. All of these reports have fast turn round times. Argyll's range of flood risk screening reports is as follows:

3.1.1. FLOODSolutions Residence

This report is tailored for residential properties of 0.25 hectares or less in size. It is ideal for the non-technical property owner and will help sellers/buyers, lenders and insurers to understand the potential impact of the principal flood risks on the property. The Argyll risk assessment is produced using the computerised Argyll Risk Matrix. This type of report should not be used for a commercial transaction.

3.1.2. FLOODSolutions Brief

This report is suitable for commercial properties, agricultural land and larger residential properties where there is no concern about the risk from dams or reservoirs and the client is not concerned to see each type of flooding independently mapped. The Argyll risk assessment is produced using the computerised Argyll Risk Matrix.

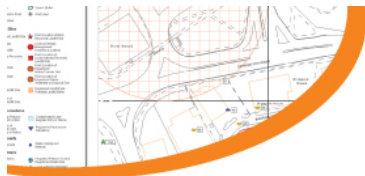
3.1.3. FLOODSolutions Commercial

This report is suitable for commercial properties and agricultural land where the parties want the additional data analysed, would like to see the types of flooding depicted on separate maps, or particularly want the added confidence of the Argyll overall assessment being reviewed manually by a qualified consultant. This report investigates the risk to a site from dam break or reservoir failure. It also reports separately on whether there are Main Rivers or other water features on or near a site, and (if the information is available from the responsible water authority) whether there are recorded episodes of sewer flooding that affect a site.

3.2. Flood risk scoping reports

These look at additional data and may also involve raising direct enquiries of relevant authorities and regulators. Their purpose is to enable a more accurate and detailed analysis of the flood risk. Again it is a desktop report (normally with no site visit), though the scope of the report can, by agreement, be expanded and tailored to the particular transaction. Risk scoping reports can also include recommendations on the possible flood management measures that could be taken (by estimation of approximate depths of flooding), and can indicate the likely scope and cost of an FRA. **FLOODSolutions Consult** is one form of risk scoping report. Turn round times can be fast, but this depends on whether consultation with regulators if necessary, and if so, how quickly the external agencies respond.

The **FLOODSolutions Consult** report is suited to sites where further information is required to identify and then manage the flood risks. It looks at additional data such as LIDAR (detailed height



information), flood defence specifications and any other information that may be obtained from the relevant statutory bodies within England and Wales by specific written questions. This process can reveal information which those bodies only hold on paper-based registers, rather than in electronic form. This type of report will include suggestions (and costs estimates) for simple flood management measures. It can also set out the likely scope of works (and estimated costs), which would be required in any FRA (if the Site were to be redeveloped and planning consent were needed).

3.3. Flood risk assessments (FRAs)

These offer a comprehensive analysis of flood risk and appropriate solutions. They are generally needed in connection with new developments (where they may be required under PPS25), although they can be used on other sites where a detailed understanding of flood risk is required (perhaps to inform the design of integrated flood protection measures). They can include advice on suitable flood resistance or resilience measures, on SUDS (Sustainable Urban Drainage Systems) and on other flood management options. Argyll works with JBA to prepare FRAs. The time needed to prepare an FRA and the cost is very variable. Please ask one of our consultants for further information on this.

Working together with JBA we can deliver FRAs that are tailored to your particular site and development proposals. We will liaise with the relevant authorities and the Environment Agency as part of the preparation of the FRA. Please contact us for further information relating to your specific requirements.

4. Argyll's other consultancy services

Where your acquisition or development warrants this, Argyll's multi-disciplinary team of consultants can arrange, co-ordinate or deliver a wide range of consultancy services connected with flood and water management issues. These include:

- On site investigation of flood risk and potential solutions (including flood resistance and flood resilience changes to the structure of the buildings on the site)
- Plans for site drainage on new development, including the use of Sustainable Urban Drainage Systems (SUDS)
- Planning application guidance and support

Please contact us to discuss your specific requirements with an experienced consultant.

5. Ordering and useful contacts

Reports can be ordered from the Argyll Environmental website www.argyllenvironmental.com

You will require a login and password which can be set up online. Alternatively, please contact our client services at 0845 458 5250 or email info@argyllenviro.com if you would like us to set up an account for you.



For detailed assistance in making orders through our website, please refer to our Client Area Website User Guide. This is available to download from the report ordering page.

Alternatively you can order our reports from TM Group, MDA Searchflow, PSG and all other major resellers.

General and report order enquiries:

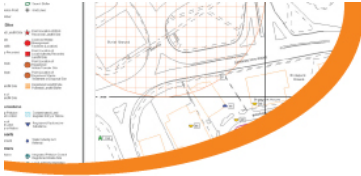
Email: info@argyllenviro.com

Phone: 0845 458 5250

Fax: 0845 458 5260

Address: Argyll Environmental Ltd, Tower Point 44, North Road, Brighton, BN1 1YR.

Our administration team will be happy to direct your query to the appropriate staff member.



Appendix I

Datasets Currently Used in Argyll **FLOODSOLUTIONS** Reports

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Inclusive Report Type
Aerial Photography	Get Mapping's aerial photography provides a seamless, full colour survey of the country. Data is sourced from a 2004 high resolution map database, with any gaps in the database filled by the 1999 'Millennium Map'. This data covers England, Scotland and Wales.	Get Mapping	Aerial Mapping	From 1999 to 2004	As notified	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
Areas Benefiting from Flood Defences	This data set shows those areas benefiting from demarcated flood defences whereby in a 1% fluvial or 0.5% tidal flood event, areas that would otherwise flood are protected provided that the defences do not breach. This data covers England and Wales only.	Environment Agency	Polygon & Text	From 2005	Quarterly	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
BGS Geological Indicators of Flooding	<p>This data set identifies areas prone to the two main types of flooding - inland (fluvial floodplains) and coastal/estuarine, based upon the observation of the types of geological deposit present. The data covers England, Scotland & Wales.</p> <p>The data set is a digital map based on the BGS Digital Geological Map of Great Britain at the 1:50,000 scale. It was produced by characterising Superficial (Drift) Deposits on this map in terms of their likely vulnerability to flooding, either from coastal or inland water flow. These Superficial Deposits are considered 'recent' in geological terms, most having been formed in the later parts of the Quaternary geological period (i.e. within the last few tens of thousands of years).</p> <p>Observations made during recent major inland and coastal flooding events have demonstrated that the erosion and deposition of these recent geological sediments have produced subtle topographical variations, resulting in landforms such as fluvial and coastal floodplains. The mapping of these landforms, in conjunction with the fluvial and/or coastal deposits that underlie them, has in turn determined the extent of previous coastal and inland flooding.</p> <p>The data set does not take into account any manmade influences such as flood protection schemes, nor does it take into account the possibility of flooding onto low-lying ground that is not occupied by the 'indicator' deposits described above.</p>	British Geological Survey (BGS)	Polygon & Text	Not Applicable	Annually	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
BGS Groundwater Flooding Susceptibility	<p>This data set is the first national hazard or susceptibility data set of groundwater flooding. The data set covers England, Scotland & Wales.</p> <p>Groundwater flooding is increasingly recognised as a hazard and can be defined as the emergence of groundwater at the ground surface, or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded. Based on geological and hydro-geological information, digital data has been used to identify areas where geological conditions could enable groundwater flooding to occur and where groundwater may come close to the ground surface.</p> <p>The data set defines areas with one of five levels of groundwater susceptibility, ranging from high susceptibility to negligible or no susceptibility. Areas with no data represent areas with no susceptibility to groundwater flooding. The resolution of the modelled output is 50m by 50m cells. The data set is a hazard data set, not a risk data set, meaning that it does not provide any information about the likelihood of a groundwater flooding event occurring.</p>	British Geological Survey (BGS)	Polygon & Text	Not Applicable	Annually	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
Reservoir Failure	This mapping identifies areas that are most likely to flood following the sudden catastrophic failure of a reservoir. JBA has identified over 1,700 reservoirs (throughout England, Scotland and Wales) that pose a risk to people and property. These maps show properties that would flood in the unlikely event of the failure of the reservoirs' dam or embankment. Empirical methods were used to predict the flow that would result from the failure, which was then modeled onto high resolution Digital Terrain Models (DTM) using JBA's advanced 2D hydraulic modeling techniques. The model provides the maximum depth of flooding in each 5m ² cell of the DTM.	JBA Consulting	Polygon & Text	Current	As notified	FLOODSOLUTIONS Commercial
Detailed River Network Lines	This data describes the rivers, drains and streams which can be found in England and Wales. The Detailed River Network (DRN) Lines dataset is a drainage centre-line dataset captured primarily from the water features theme of Ordnance Survey's (OS) MasterMap Topography Layer, at three separate	Environment Agency	Line & Text	Current	As notified	FLOODSOLUTIONS Commercial

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Inclusive Report Type
	scales: 1:1,250, 1:2,500 and 1:10,000. DRN geometry is linked back to the contributing OS MasterMap topographic water features following the principles of the Digital National Framework (DNF) and is designed to represent a continuous, detailed network of water flows. The DRN Lines dataset is the primary feature class of the DRN dataset - line features that represent the river network. The data contains some features located in Scotland where water features either flow into or originate in Scotland.					
Detailed River Network Offline Drainage	This data describes water features that do not connect into the detailed river network. The Detailed River Network (DRN) Offline Drainage dataset is a drainage centre-line dataset captured primarily from the water features theme of Ordnance Survey's (OS) MasterMap Topography Layer, at three separate scales: 1:1,250, 1:2,500 and 1:10,000. DRN geometry is linked back to the contributing OS MasterMap topographic water features following the principles of the Digital National Framework (DNF) and includes water features from OS MasterMap that do not connect into the river network and are generally limited in length. The data contains some features located in Scotland where water features either flow into or originate in Scotland.	Environment Agency	Line & Text	Current	As notified	FLOODSOLUTIONS Commercial
Extreme Flooding from Rivers or Sea without Defences (Zone 2)	Flood Zones are defined by the Government's Planning Policy Guidance 25 on 'Development and flood Risk' for England (PPS25) dated July 2001. The Flood Zones illustrate the probability of flooding across England for planning consultation. The Flood Zones have been identified using the best available data held by the Environment Agency ignoring the presence of flood defences (as required by PPG25, reference table 1 note (a)). This data set is Flood Zone 2, the Environment Agency's best estimate of the areas of land, ignoring the presence of defences with an annual probability of flooding of 0.1 % (1 in 1000) or greater from rivers and the sea, but with an annual probability of flooding of less than 1 % from rivers. This definition of Flood Zone 2 applies only in England. Equivalent data is also provided for Wales, although in Wales the data on this layer of the Flood Map does not have the same relationship to Planning Guidance and is not referred to as Flood Zones.	Environment Agency	Polygon & Text	From 2005	Quarterly	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
Flooding from Rivers or Sea without Defences (Zone 3)	Flood Zones are defined by the Government's Planning Policy Guidance 25 on 'Development and Flood Risk' for England (PPS25) dated July 2001. The Flood Zones illustrate the probability of flooding across England for planning consultation. The Flood Zones have been identified using the best available data held by the Environment Agency ignoring the presence of flood defences (as required by PPG25, reference table 1 note (a)). This data set is Flood Zone 3, the Environment Agency's best estimate of the areas of land, ignoring the presence of defences with an annual probability of flooding of 1.0 % (1 in 100) or greater from rivers, and 0.5 % (1 in 200) or greater from the sea. This definition of Flood Zone 3 applies only in England. Equivalent data is also provided for Wales, although in Wales the data on this layer of the Flood Map does not have the same relationship to Planning Guidance and is not referred to as Flood Zones.	Environment Agency	Polygon & Text	From 2005	Quarterly	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
Flood Defences	This is the Environment Agency's holding of Linear Flood Defences. This data set contains all flood defences constructed during the last five years with a standard of protection equal to or better than 1% for rivers and 0.5% from the sea. Some additional defences, which may be older or may have been designed to provide a lower standard of protection, are also shown where the information is currently available. This layer comprises linear flood defences, for flood embankments and walls. This data does not cover Scotland.	Environment Agency	Polygon & Text	From 2005	Quarterly	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
Flood Water Storage Areas	The Environment Agency's holding of 'Flood Storage Areas'. A flood storage area may be referred to as a balancing reservoir, storage basin or balancing pond. Its purpose is to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel. It may also delay the timing of a flood peak	Environment Agency	Polygon & Text	From 2005	Quarterly	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Inclusive Report Type
	so that its volume is discharged over a longer time interval. This data does not cover Scotland.					
Historic Flood Events	Historic Flood Events data outlines the individual location outline and associated attributes for all records of historic flooding from rivers, the sea and groundwater held by the Environment Agency. This data does not cover Scotland.	Environment Agency	Polygon & Text	Current	As notified	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
Inland Water	The Inland Water database is a sub-set derived from OS Mastermap. Inland water features such as lakes, ponds, reservoirs and docks are digitised and highlighted as individual features. This data covers England, Scotland and Wales.	Ordnance Survey	Polygon & Text	Current	As notified	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
NaFRA 2008 Property Flood Likelihood Category	<p>NaFRA 2008 Spatial Flood Likelihood Category (FLC) Grid (version 8.2) is the latest output using the Risk Assessment for flood and coastal defence for Strategic Planning (RASP) High Level Method Plus (HLM+). It is a broad-brush assessment of the likelihood of flooding at a national scale, based on assessments undertaken for 85 river catchments and coastal cells, where a cell is an area of land measuring 50m by 50m.</p> <p>NaFRA 2008 Spatial (FLC) Grid enables a comparison of the relative risks and their distribution within each of these catchments, rather than a detailed, local assessment of the risk at a specific location. The calculations provide an indication of the likelihood of flooding at the centre of each cell. These results are then placed into three risk categories as used by the insurance industry. The three risk categories are:</p> <ul style="list-style-type: none"> • low - the chance of flooding each year is 0.5 per cent (1 in 200) or less • moderate - the chance of flooding in any year is 1.3 per cent (1 in 75) or less but greater than 0.5 per cent (1 in 200) • significant - the chance of flooding in any year is greater than 1.3 per cent (1 in 75) <p>Some areas are classified as having no result. This occurs where there is no output data from the analysis used to produce NaFRA 2008, but the area falls within the extreme flood outline (with a 0.1% or 1 in 1000 chance of flooding in any year), as shown on the Environment Agency's Flood Map at the start of the analysis (May 2008). This data does not cover Scotland.</p>	Environment Agency	Vector Polygon	From 2008	As notified	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
OS Land-Form PROFILE Air Heights	Land-Form PROFILE Air Heights define the height above sea level at a single point. Air Heights are recorded to the nearest 1.0 m and typically follow Hill tops, valley junctions, low-lying areas and river crossings. Selected Air Heights are captured from Ordnance Survey's 1:10,000 scale mapping and this is supplemented by Spot Heights, and high and low water marks from Ordnance Survey 1:1,250, 1:2,500 and 1:10,000 scale digital mapping data. This data covers England, Scotland and Wales.	Ordnance Survey	Point	Current	As notified	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
OS Land-Form PROFILE Spot Heights	Land-Form PROFILE Spot Heights define the height above sea level at a single point and were fixed by ground survey methods, mainly spirit levelling, at the time the national bench mark network was established and are normally positioned along the centre of roads (recorded to the nearest 0.1m). Some additional Spot Heights were surveyed using height traversing techniques to supplement Air Heights in areas of sparse control. Selected Spot heights are captured from Ordnance Survey's 1:10,000 scale mapping and this is supplemented by Air Heights, and high and low water marks from Ordnance Survey's 1:1,250, 1:2,500 and 1:10,000 scale digital mapping data. In confined circumstances (for example ancient earthworks) where the topography is depicted by slope symbols instead of contours, a single central Spot height is captured. On extended features, spot heights are captured at intervals of 750m. This data covers England, Scotland and Wales.	Ordnance Survey	Point	Current	As notified	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial

Title	Remarks	Source	Data Type	Data Range	Update Cycle	Inclusive Report Type
Streetview	1:10,000 scale raster National Grid providing national coverage of Great Britain. This is derived from the Ordnance Survey Landplan® and OSCAR Traffic Manager® road information. This data covers England, Scotland and Wales.	Ordnance Survey	Raster Mapping	Current	Bi-Annually	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial
Surface Water Flood Risk	This mapping identifies areas that are most likely to flood following extreme rainfall events (i.e. land naturally vulnerable to surface water (pluvial) flooding). It is produced by simulating rainfall falling onto high resolution Digital Terrain Models (DTM) using JBA's advanced 2D hydraulic modelling techniques. This modelling identifies overland flow routes and areas where surface water will naturally pond. The model provides the maximum expected depth of flooding in each 5m ² cell of the DTM, which is processed into depth bands to identify varying levels of risk. The output provided is divided into four categories, negligible, low (more than 0.1m), medium (more than 0.3m) and high (more than 1m) which reflect varying depths of potential surface water flooding. Any areas showing potential surface water flooding below 0.1m are not included. This data was modelled using detailed regional rain forecasts, based on an extreme 1:200 year event (or return period), which will overwhelm typical UK drainage systems. The modelling ignores the presence or artificial drainage. This data covers England, Scotland and Wales.	JBA Consulting	Polygon & Text	Current	As notified	FLOODSOLUTIONS Residence FLOODSOLUTIONS Brief FLOODSOLUTIONS Commercial