

# ANGUS LOCAL DEVELOPMENT PLAN

## Strategic Flood Risk Assessment

February 2015



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## 1. INTRODUCTION

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The primary aim of Strategic Flood Risk Management is to avoid locating new development in areas of flood risk. Directing all new development away from areas of flood risk in existing communities is not always a viable or sustainable option and there will be a need to ensure that development adapts to the changing climate and become more resilient to its effects.

The Strategic Flood Risk Assessment (SFRA) provides evidence to inform preparation of the Proposed Angus Local Development Plan (ALDP) by identifying:

- where flood risk is likely to be an issue;
- how much of the area is defended by flood protection schemes;
- where new development is likely to exacerbate flood risk; and
- where flood risk may need to be assessed in further detail.

The Flood Risk Management (Scotland) Act 2009 was introduced to provide a more sustainable approach to flood risk management, suited to the needs of the 21st century and to the impact of climate change. It creates a more joined up and co-ordinated approach to managing flood risk at a national and local level in an integrated and sustainable way through:

- co-ordination and co-operation between all organisations involved in flood risk management;
- assessment of flood risk at a national level and the preparation of local flood risk management plans;
- new responsibilities for the Scottish Government, SEPA, Scottish Water and local authorities in relation to flood risk management;
- a revised, streamlined process for the approval of flood alleviation schemes;
- new methods to involve stakeholders and the public in action to manage flood risk; and
- a single enforcement authority for the safe operation of Scotland's reservoirs.

Angus Council has been identified as the Lead Local Authority in preparing the local flood risk management plan for the Tay Estuary and Montrose Basin Local Plan District and The Council is also involved in the preparation of the flood risk management plan for the Tay Local Plan District.

Strategic Flood Risk Assessment provides an overview of flood risk from all sources within a wide geographical area – in this instance the area covered by the Proposed ALDP. The SFRA's main objectives are to:

- ensure development does not take place in areas of flood risk or contribute to flooding elsewhere;
- enhance the baseline for the Environmental Report;
- identify the flood risk areas based on the risk framework in Scottish Planning Policy (SPP 2014); and

- provide an evidence-based report to inform the Proposed ALDP.

## 2. FLOOD SOURCES IN ANGUS

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Angus is primarily a rural area with seven towns and numerous smaller villages and settlements mostly in the Strathmore Valley and coastal lowlands. These settlements experience differing degrees of flood risk, predominantly from river (fluvial) flooding but some locations are susceptible to coastal (tidal) flooding. There is also a risk from surface water flooding from rainfall (pluvial) run-off from the surrounding land/roads resulting in 'ponding' from standing water before it enters a natural or man-made drainage system or watercourse. In some cases this may be due to the drainage system already being at capacity and unable to accommodate surface water until flow within the system subsides.

Recent flood events in October and December 2012 and January 2013 highlighted flood issues in parts of Angus and the risk of flooding may increase if intense rainfall events become more frequent. Table 1 below highlights the number of severe weather warnings issued during the relevant period.

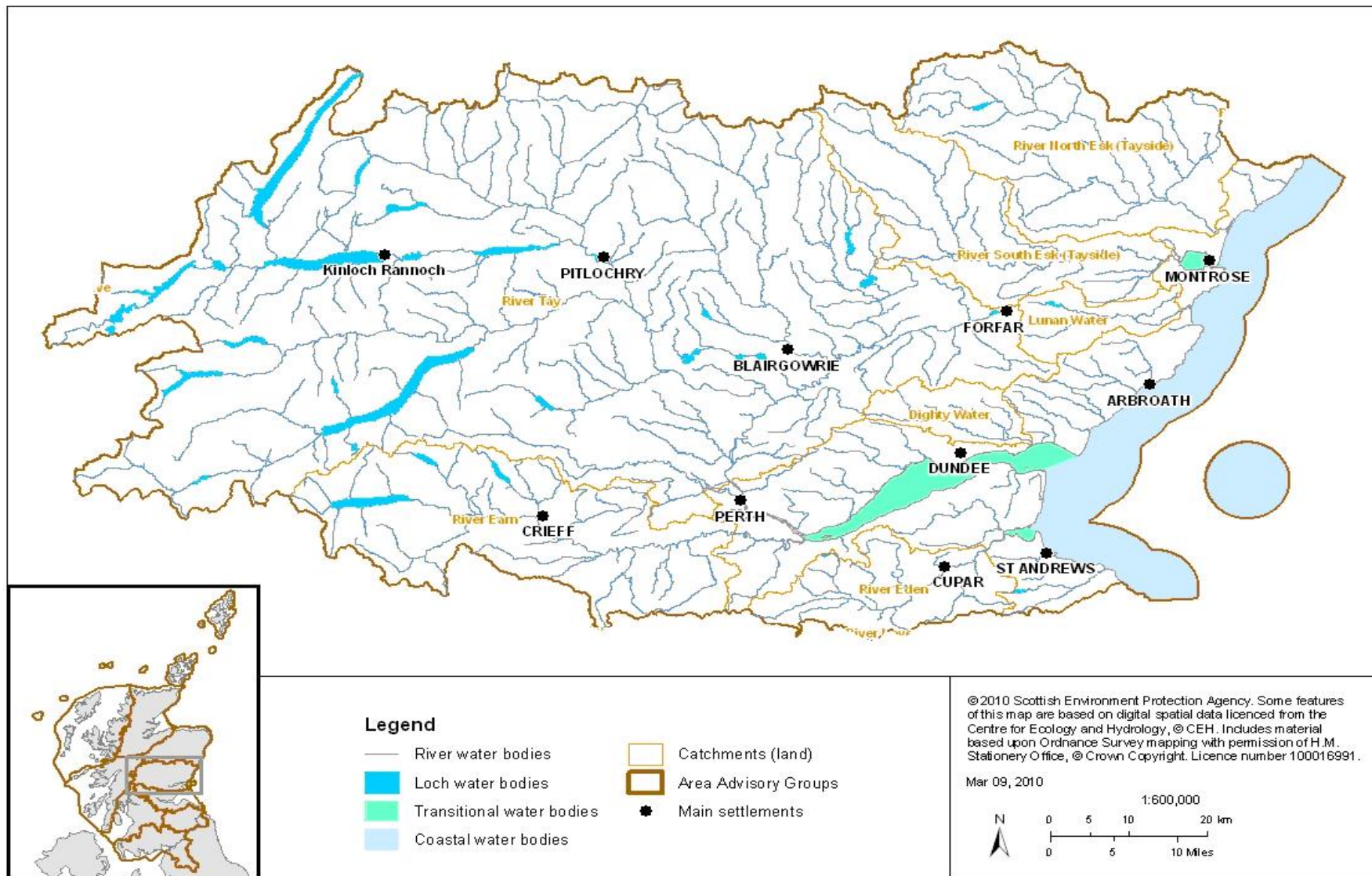
**Table 1: Severe weather warnings issued, by year and weather type**

Year	Snow	Rain	Ice	Wind	Total
2009	7	9	5	0	21
2010	11	6	29	0	37
2011	6	3	5	9	23
2012	4	22	6	3	35

(Source – Angus Council: Local Climate Impacts profile 2009-2012)

The area covered by the Proposed ALDP includes a number of significant River Catchments. These include all or part of the River North Esk, the River South Esk, the Lunan Water and the River Isla.

Figure 1: The river network in the Tay area (Including the Angus ALDP area)



Source: SEPA Tay Area Management Plan

The risk of flooding in some areas may be reduced through the protection provided by existing natural flood management features (beaches, mud flats, reed beds etc.) or managed by man-made defences (embankments, storage areas, walls etc.). Table 2 below indicates the area of Angus within identified 1:200 fluvial or coastal flood zones.

**Table 2: Proposed ALDP Area within 1:200 fluvial or coastal flood zones**

<b>Angus</b>	<b>Fluvial Flooding Extent</b>	<b>Fluvial Flooding Extent</b>	<b>Coastal Flooding Extent</b>	<b>Coastal Flooding Extent</b>
Area (km <sup>2</sup> )	Area (km <sup>2</sup> )	Area(%Angus)	Area (km <sup>2</sup> )	Area (%Angus)
1880	103.4	4.7	7.8	0.4

(Source Angus Council State of the Environment Report 2011)

### **3. INDICATIVE FLOOD MAPPING**

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The Scottish Environment Protection Agency (SEPA) holds national scale models of watercourses with a catchment greater than 3km<sup>2</sup> and much of the coastline, which broadly define the areas at risk of fluvial and coastal flooding in Scotland. Information from a range of sources is now used to identify all known sources of flooding. The Flood Hazard and Risk Maps published by SEPA (2014) present the best available information for the Proposed ALDP area in general and now comprise information on all types of flooding and recorded flood defences. Additionally the Potentially Vulnerable Area (PVA) maps identify areas where the potential impact from flooding is sufficient to justify further assessment and appraisal of Flood Risk Management actions although not all properties within a PVA are at risk of flooding.

This information is used in the selection of land allocations in the Proposed ALDP (see maps in Section 8 below) and to inform the Development Management process. Where a site is shown to be in a 1:200 area of flood risk then development should not be encouraged at this location. The SFRA identifies where information relating to surface water management and flood risk is required to support a development proposal. These requirements will be applied through the Proposed ALDP and the Development Management process.

#### 4. SCOTTISH PLANNING POLICY

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Scottish Planning Policy provides the flood risk framework used as a basis for planning decision making where there is a known flood risk. Local Development Plans should use this framework and the SFRA will guide development and inform choices about the location of development. Additionally local development plans should:

- have regard to the flood maps prepared by Scottish Environment Protection Agency (SEPA);
- take account of finalised and approved Flood Risk Management Strategies and Plans and River Basin Management Plans;
- have regard to the probability of flooding from all sources and take flood risk into account in development plans;
- address any significant cross boundary flooding issues; and
- protect land with the potential to contribute to managing flood risk.

This guidance forms the basis for the Proposed ALDP Strategic Flood Risk Assessment. There is a presumption against development in areas of flood risk or where development would increase flood risk elsewhere. However, in exceptional circumstances, where this is not possible, it may be necessary to consider development in areas of risk providing the proposed development is not contrary to SPP.

#### 5. HISTORICAL FLOODING

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As part of the SFRA it is important to understand where there have been incidences of flooding in the past. The following section sets out recorded incidences of flooding in the seven towns.

##### **Arbroath**

Following flooding in October 1976 and February 1987, which affected Dens Road, Wardmill Road, Catherine Street, Hume Street, West John Street, Lindsay Street, East Grimsby, Brothock Bridge area, Burnside Drive, Marketgate and Ladybridge Street, a flood prevention scheme was constructed (1987) to prevent a recurrence of flooding from a similar sized event (considered to be a 1 in 25 year return period flood). It is important to note that this flood prevention scheme does not meet current 1 in 200 year standard of protection and the Scottish Flood Defence Asset Database conditional assessment in 2005 indicated that the scheme only has a standard of protection of a 1 in 5 to 1 in 10 year event. Angus Council are considering options for enhancing the existing protection. In the meantime any redevelopment close to the Brothock Water may need to provide additional



mitigation measures to conform to SPP providing that the proposals would not increase the risk to existing properties.

It should also be noted that there is risk of coastal flooding along the sea frontage and a combined fluvial and tidal risk in the lower reaches of the Brothock Water.

In February 1994 there was flooding in the Ladybridge and Harbour areas following a weekend of continuous rain. This flood and some similar isolated events have occurred despite the construction of the existing flood prevention scheme. There are further records of properties flooding in July and September 1873, September 1891 November 1876, May 1907, and October 1998.

### **Brechin**

There is a history of fluvial flooding from the River South Esk. Angus Council has undertaken a number of investigations to support a submission to the Scottish Government for a flood prevention scheme. The largest flood in recent years occurred in 2002. This resulted in extensive flooding and temporary evacuation of some residents. It has been estimated that a 1 in 100 year event could result in over 150 dwellings and 10 businesses being affected. There are further records of properties flooding in 1774, December 1853, 1860 where the paper mill and inch were completely inundated, November 1891, May 1913, and October 1920 where 58 houses were inundated, 1921, 1951, 1957, 1960, 1982 and 2011.

Certain areas in Brechin are also at risk from surface water flooding and this has been taken into account in the design of the flood prevention scheme to be constructed 2014-2016.

### **Carnoustie**

There is a history of flooding in Carnoustie, including significant occurrences in February 1977. There is an existing flood prevention scheme on the Barry Burn but there are still flooding issues in this location. There is some concern that the 200 year standard of protection can only be achieved by dredging the watercourse. The areas covered by the flood defences include, Buddon Drive, Harris Road, MacDonald Smith Drive, Ravensby Road, Thomas Street, James Street, Taymouth Street and Waterybutts areas.

There has been isolated flooding in Carnoustie since the Barry Burn flood prevention scheme was completed. In August 2008 there was a heavy rainfall event which resulted in reports of flooding in MacDonald Smith Drive, Ravensby Road, Thomas Street and James Street. In September 2009 there was flooding in Thomas Street and Ravensby Road with reports of flooded gardens. This flooding was again related to heavy rain and drainage issues rather than direct inundation from the nearby watercourse. Low lying areas close to the coast may also be at risk to tidal flooding.

Groundwater and pluvial flooding may still be an issue in areas behind the flood embankments.

### **Forfar**

There were flood events in December 2012 and January 2013 caused by surface water flooding issues which may be related to the height of water levels in Forfar Loch. Angus Council has undertaken some works recently to lower water levels to previous levels.

There are further records of properties flooding in August 1887 and localised surface water flooding in summer 2007 and September 2009

### **Kirriemuir**

There is a flood prevention scheme on the Gairie Burn however this does not meet the current required standard of protection and future proposals for development will need to consider the risk of flooding from all sources.

### **Monifieth**

In March 2009 there was some damage to the coastline by higher than normal tides. In September 2009 there was flooding of properties in the Milton Place area from high water levels in the Dighty Water.

There are also accounts of localised pluvial flooding in Monifieth in September 2009, October 2012 (including the A92) and April 2014 at the east end of the High Street.

### **Montrose**

In 2009 flooding affected Lighthouse Road, West Terrace and Church Road in Ferryden, the A92 at Upper Dysart, Rossie Braes and Bridge End Garage, the A937 Marykirk to Craigo Road, the A935 at Tayock Cottages and Logie Pert.

There are further records of properties flooding in September 1873, August 1882, 1907 and 1990. Flooding on Aulton Way has apparently been a recurring problem since 1975, which may be related to sewer flooding and there are reports of pluvial flooding in 2002 in the Montrose area and sewer flooding in Dorward Road in November 2006. Ferryden is reported to have issues of flooding in November 2009 and December 2012. In January 2005, Montrose experienced some property flooding alongside the Tayock Burn due to high tide levels within the Montrose Basin.

Montrose is generally low lying. The lowest areas adjacent to the coast and Montrose Basin may be at risk to coastal flooding. SEPA also highlight that consideration should be given to the Angus Council Shoreline Management Plan when allocating areas for future development.

## 6. FLOOD RISK ASSESSMENT

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In line with the housing requirements for Angus set out in the TAYplan Strategic Development Plan (SDP) (2012) the Angus LDP is required to make provision for around 3740 houses over the period 2016-2026. These will be allocated through the Proposed ALDP in the seven towns, with limited additional provision in the larger villages. The spatial planning of these new developments must be considered with regard to the current and future risk of flooding from all potential flood sources - fluvial, tidal, surface and ground water. It is therefore vital that flood risk is considered at a strategic scale to inform land allocations and future developments within the emerging Proposed ALDP.

This SFRA follows guidance contained in SEPAs Land Use Planning System Guidance Note 23 Strategic Flood Risk Assessment and the TAYplan Strategic Flood Risk Assessment May 2011.

The information presented in this Level 1 SFRA is not an exhaustive list of all available flood related data for the study area. The Level 1 SFRA is based on available data collated at an appropriate scale.

### **Flood Sources in the Proposed ALDP area**

The main sources of flooding within Angus are from fluvial and tidal sources, but pluvial run-off and surface water can also result in flood occurrences and may become more common if extreme weather events and concentrated rainfall increase.

#### Fluvial Flood Sources

The main rivers in the area drain from the upland area to the north and west and predominantly drain in a south easterly direction to the North Sea. The North, South Esk, Isla, and Lunan have large catchments and there is significant time lag to the downstream part of the catchment before any onset of flooding. Some of the smaller tributaries in the upper reaches of the catchments may be susceptible to flash flood events within steep valley sides but this would not be an overall characteristic in the Angus area. The Lunan is heavily influenced by groundwater and rises within a wide valley and is unusual in a Scottish hydrological context. Smaller watercourses such as the Brothock or Carnoustie Burn have relatively small catchments and so could be classed as flashier.

#### Coastal Flood

Coastal flooding affects lower reaches of rivers and low-lying coastal areas. Tidal surges can exacerbate coastal flood events. Isostatic uplift is no longer thought to be sufficient to counteract sea level rises affecting Angus and therefore incidences and extent of coastal flooding may increase.

### Surface Water (Pluvial) Sources

Significant surface water flood events have occurred in Forfar and to a lesser degree Arbroath. These are predominantly caused by intense, heavy rainfall causing water to runoff from surrounding areas and are in some cases linked to the lack of capacity of storm water management systems.

### Sewer Flooding (Storm water sources)

Scottish Water is the statutory water undertaker and maintains a register of historical sewer flooding events and is responsible for public sewers systems within the ALDP area. Information on privately owned and maintained storm water management systems is unavailable.

### Groundwater Sources

The understanding of groundwater flooding in Angus is still developing but is a significant part of flooding issues. Influence of groundwater has been recorded in Carnoustie, and the Lunan catchment. Flooding of property has been recorded from groundwater prior to the overtopping of informal agricultural flood embankments on the River South Esk.

### Reservoir/Infrastructure Flooding

Although unlikely, failure of infrastructure such as dams could result in a large volume of water being released very quickly. SEPA will become the regulating authority under the Reservoirs (Scotland) Act 2011 and this places a duty on SEPA to ensure that reservoirs are monitored, inspected and maintained to ensure their structural stability and reduce the flood risk posed by the impounding structure.

### Specific Local Information

Angus is predominantly rural with Arbroath being the largest settlement. With six other towns and a wide range of villages and hamlets dispersed across the area Angus is consequently, a relatively low level of flood risk when compared with some surrounding Council areas. Strategic infrastructure – A90 (T) and east coast rail line – and local communication networks can be affected by extreme weather but closures are generally short term with few incidences of permanent damage. The Shoreline Management Plan makes provision for the protection of road and rail infrastructure where affected by coastal flooding. Historical data provided by SEPA and the Council's own records indicate that several major flooding incidents have occurred in the past as a result of tidal, fluvial and surface water sources. Flooding from other sources is also important when considering broad scale flood risk across the area and further data obtained from stakeholders has been used to identify issues.

## **Flood Mitigation Works – Capital Projects**

River South Esk River Street Brechin

A flood prevention scheme for Brechin has been approved by the Scottish Minister and Angus Council are in the process of submitting a funding bid for the construction work. The scheme will consist of walls and embankments adjacent to the River South Esk to reduce the fluvial flood risk along with a secondary drainage system which captures surface water from behind the flood walls and pumps it over the wall.

#### Brothock Water, Arbroath

The Council will promote further flood prevention measures for the Brothock Water, incorporating upstream attenuation in the existing flood plain to the north of Arbroath which will reduce the peak flows in the Brothock to a level within the capacity of the existing flood prevention scheme downstream.

### **Level 1 SFRA Methodology**

#### **Data/Information Collected**

Information/data collected was integrated within a GIS system includes:

- Scottish Environment Protection Agency flood information e.g. historic flooding, water levels, photos, land use vulnerability;
- Scottish Environment Protection Agency Indicative Flood Maps;
- Local Authority Information as Flood Prevention Authority

#### **Flood Risk Review**

In preparing the SFRA existing information on flood sources and flood risk has been collated and reviewed to assist Angus Council in considering flood risk in strategic land allocations and developing future policies. This has been achieved by providing sufficient information to enable the application of the Flood Risk Framework to inform selection of suitable sites for development in relation to flood risk and where mitigation measures or further assessment is, or may be, required.

The precautionary principle should apply to all forms of development. In areas where the return period is 1:200 or less, development may be acceptable with appropriate mitigation measures in accordance with the flood risk framework. Essential infrastructure and services should not be located where their access and function will be detrimentally affected by flooding and facilities/accommodation for vulnerable groups should be located outwith the 1 in 1000 year return period. Detailed development proposals in such areas should be subject to flood risk assessment. Development should not exacerbate flooding elsewhere and be located away from functional floodplains. Surface water management may be required, including SUDs, natural flood management and use of permeable surfaces. Development should not exacerbate or lead to pluvial flooding elsewhere. The precautionary approach applies across Council Boundaries and assessment may be required to identify mitigation measures.

## 7. BROAD SCALE ASSESSMENT

Settlements where greenfield development land is allocated together with the number of homes required over the Plan period.

**Table 3: New Housing and Employment Land Allocations 2016 - 2026**

Settlement	Settlement area* (approx km <sup>2</sup> )	New Employment Land Allocations (ha)	House Numbers 2016-2026	New Housing Land Allocations (ha)	Area of Flood Risk (1:200)
Arbroath	8.52	0	350	14.4	Boundary watercourse
Brechin	3.45	27.0	0	0	0
Carnoustie	4.87	10.0	250	10.0	Boundary watercourse
Forfar	6.49	0	600	56.4	0
Kirriemuir	2.44	0	50	6.0	0
Monifieth	2.67	0	480	24.8	0
Montrose**	7.92	61.0	330	3.0***	Boundary coastal
Edzell	4.5	0	50	6.2	Boundary watercourse
Friockheim	4.4	0	0	0	0
Letham	8.0	1.9	20	4.4	0
Newtyle	3.0	0	50	3.0	0
<b>Totals</b>	<b>56.26</b>	<b>99.9</b>	<b>2180</b>	<b>128.2</b>	<b>0</b>

\*Area within Development Boundary in the Angus Local Plan Review (2009)

\*\* Includes Ferryden and Hillside

\*\*\* Excludes area at Sunnyside Hospital (area for housing to be confirmed through the development management process).

The area for required new development is based on the Proposed Plan which assumes housing densities within built up area of around 25 dwellings per hectare.

**Table 4: Area Affected by 1:200 Flood Risk Area: Existing and Proposed Development**

Extent of:-	Area (km <sup>2</sup> )	% of Area
Proposed Angus ALDP area	c1,880	100
Angus ALDP area within the 1:200 Flood Risk	103.4	5.5
Angus ALDP area within the Coastal Flood Zone	7.8	0.4
Angus ALDP area protected by flood defences	0.85	0.05
Towns and Key Service Centres	56.26	2.9
Area allocated for new development	2.3	0.1
Areas affected by: <ul style="list-style-type: none"> <li>• Pluvial flood area</li> <li>• Ponding</li> <li>• Other forms of flooding</li> </ul>	Not available	Not available

### Functional Floodplain

SPP (2014) defines functional flood plain as:

*'areas of land where water flows in times of flood which should be safeguarded from further development because of their function as flood water storage areas. For planning purposes the functional floodplain will generally have a greater than 0.5% (1:200) probability of flooding in any year.'*

Proposed new development which is at risk of flooding or could place existing settlements at risk is considered a significant pressure. ALDP allocations seek to avoid areas at risk of flooding, as shown in the maps in Section 8.

Avoidance of flood risk and avoidance of development in the functional floodplain represents the most sustainable solution in terms of sustainable flood management and should be the primary mitigation measure in relation to flood risk. Planning has a crucial role to play in ensuring that due weight is afforded to flood risk and, wherever possible, unnecessary risk is avoided. New development should not lead to an increase in flood risk or to the need for additional flood alleviation or prevention measures. In addition, Section 1 of the Flood Risk Management (Scotland) Act (2009) prescribes a new duty for local authorities to exercise their functions with a view to reducing overall flood risk. All sources of flooding should be considered when assessing flood risk for new development which includes fluvial, coastal, pluvial, sewer and groundwater flooding. There is also a benefit to the environment and biodiversity in adopting an avoidance of risk principle. Avoiding development up to the edges of a watercourse is consistent with maintaining watercourse river corridors and pathways for wildlife and the biodiversity.

### Climate change

For fluvial sources, the effects of climate change have been assumed to broadly reflect the 1:1000 flood event. For narrow floodplains with incised channels, the extent of flooding is not likely to increase significantly as a result of climate change,

erosion may be exacerbated. In areas where no detailed climate change modelling exists, this finding is supported by the relatively small difference in the extents of the 1:1000 and 1:100 zones in the SEPA Indicative Flood Map. However, it is important to note that this is an indicative measure only but as a result of climate change, the depth of flooding is likely to increase in these areas which will have an impact on the flood hazard.

By contrast, the effect of climate change on fluvial flood risk in flat areas such as Strathmore can be dramatic. Where climate change is expected to increase flood risk considerably, for example, where current 'flood zones' are large (usually on wider, flatter floodplains), it may be necessary to use climate change maps in order to give a particularly long-term risk-based approach to planning.

Rising sea levels affecting Angus had been thought to be limited by isostatic uplift, but recent research has indicated that such uplift is less than initially estimated. This will result in more incidences of coastal flooding and tidal surges affecting lower lying stretches of the Angus Coast. The Shoreline Management Plan for Angus is being revised and will be published in 2015 indicating anticipated effects and action required to protect built assets from inundation. It is also possible that some areas liable to regular flooding by sea water and/or instability may be appropriate for naturalisation.

### **Consequences of Failing to Adequately Consider Flood Risk**

Developing in flood risk areas can result in significant risk to a development, site users and neighbouring property. Failure to properly assess and/or mitigate flood risk could:

1. result in additional properties and people at risk of flooding would increase the pressure on emergency services and support agencies e.g. the fire and rescue service and post flood support by the Councils. Hence, the avoidance of flood risk in the first instance is cost effective and more sustainable in the long term;
2. result in failure of a development proposal, requiring redesign of sites within the built up area and avoidance of flood risk areas in undeveloped or sparsely developed locations to mitigate flood risk;
3. increase the number of people at risk from flooding and/or increase the risk to existing populations;
4. lead to claims against the developer if an adverse effect can be demonstrated (i.e. flooding didn't occur prior to development) by neighbouring properties/residents;
5. result in properties being uninsurable and therefore unsellable; and
6. present further flood risk to the development and / or neighbouring property if SUDS are installed without arranging for their adoption or maintenance. The SUDS may eventually cease to operate as designed.



## 8. ANGUS LOCAL DEVELOPMENT PLAN ASSESSMENT

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### **Main Issues Report (MIR)**

The Flood Risk Management Act (Scotland) 2009 aims to reduce the adverse consequences of flooding on communities, the environment, cultural heritage and economic activity. The Angus Local Development Plan MIR (2012) identified preferred and reasonable alternative options for housing and employment development. These were not site specific, identifying general directions of growth. In selecting growth options SEPA Flood maps were used to identify areas susceptible to flooding (coastal and fluvial). Such areas were screened out and were not taken forward as potential options in the document.

### **Proposed Angus Local Development Plan (ALDP)**

The Proposed ALDP uses SEPA Flood Maps published in 2014 to identify areas at potential risk in the 1:200 year fluvial, pluvial, or coastal flood event. Existing housing and employment sites have been assessed by SEPA as part of the Local Development Plan and SFRA process, with the most recent consultation being part of the 2014 Housing Land Audit process.

### **Maps and Tables**

For each of the main towns and key service centres, the following maps and tables are provided where appropriate:

- Table of MIR Options with Local Authority and SEPA comment as well as location in relation to the Fluvial 1:200 flood extent. An indication is also given as to whether the site was continued to the draft ALDP or not.
- Map showing MIR Options with Coastal and 1:200 year fluvial flood data
- Table showing an assessment of ALDP Allocations and Legacy Sites
- Map showing ALDP sites/allocations with Coastal and 1:200 year fluvial flood data
- Map showing ALDP sites/allocations pluvial data

Acronyms used in the tables:

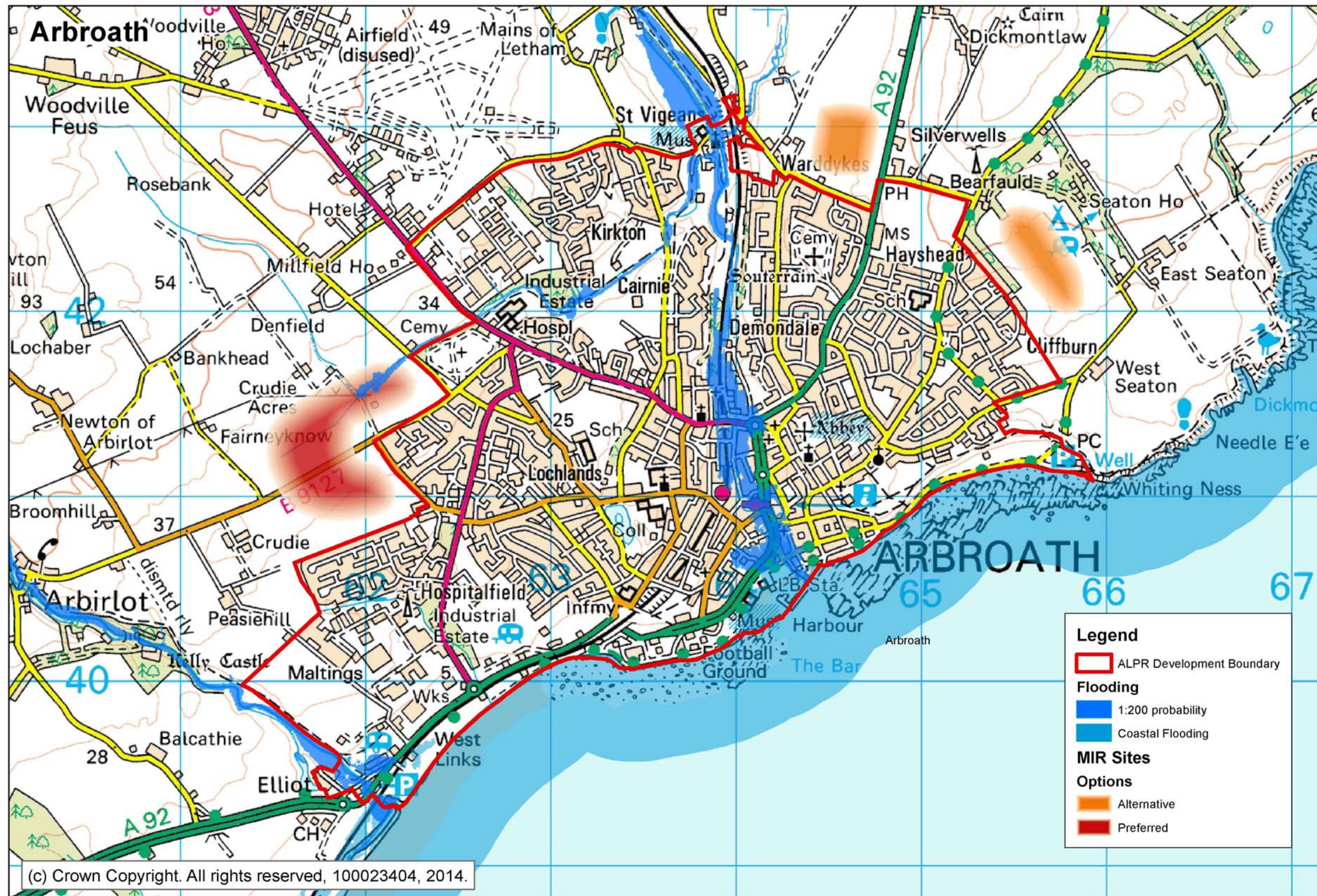
G/F	Greenfield
B/F	Brownfield
Hsg	Housing
Opp	Opportunity Site
Emp	Employment
Cem	Cemetery
FRA	Flood Risk Assessment
n/k	not known

## Arbroath

TABLE 5 - MIR Options for Arbroath

Option	Local Authority Comment	Fluvial 1:200	SEPA Comment	Action
Preferred	The area as a whole largely excludes ground that is known to have a high risk of flooding.	no	FRA would be required, reviewing area when the boundary is finalised. Flood risk must not be increased elsewhere (particularly downstream within Arbroath). Small watercourses and river crossings would need to be accounted for. All sources of flooding will need to be considered.	Continued to ALDP
Alternative 1	No flood risk issue Water quality of Brothock Water	no	FRA would be required, reviewing area when the boundary is finalised. Flood risk must not be increased elsewhere and all sources of flooding will need to be considered	Not continued to ALDP
Alternative 2	No flood risk issue	no	FRA would be required, reviewing area when the boundary is finalised. Flood risk must not be increased elsewhere (particularly downstream within Abroath). Small watercourses and river crossings would need to be accounted for. All sources of flooding will need to be considered.	Not continued to ALDP

Map 1 MIR Options in Arbroath with Coastal and 1:200 year fluvial flood data



**TABLE 6 – ALDP Identified and allocated sites in Arbroath  
Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
A(a)	Montrose Road	G/F	Hsg	no	yes	no	Historical record of run-off Montrose/Grampian Road	n/k	yes	no	Under construction – surface water management, landscaping and SUDs (just north of existing housing, should address run-off).
A(b)	Springfield Terrace, Abbeybank House	B/F	Hsg	no	no	no	Pluvial flooding recorded in the area. Design and layout to take account of any pluvial issues.	n/k	no	no	Redevelopment sites – Development Management process will apply.
A(c)	Cliffburn	G/F	Hsg	no	yes	no	Pluvial flooding recorded in the area. Potential to increase flooding downstream	n/k	yes	no	Under construction – complete
A(d)	Ernest Street / Palmer Street	B/F	Hsg	no	yes	no	Pluvial flooding recorded in the area. Refer to Flood Prevention Officer as potential surface water flooding.	n/k	yes	no	Redevelopment site with planning permission– development management applied relevant policy.
A(e)	Cairnie Loan, The Cairnie	B/F	Hsg	no		no	No flood risk apparent.	n/k	no	no	Under construction
A(f)	Viewfield Hotel	B/F	Hsg	no	no	no	No flood risk apparent.	n/k	no		Redevelopment sites – development management will consult with the FPA and apply ALDP policy.
A(h)	Alexandra Place, Arbroath Lads Club	B/F	Hsg	no	no	no					Redevelopment sites – development management will consult with the FPA and apply ALDP policy.
A(i)	Roy's Auto, 32-38 Dishlandtown St	B/F	Hsg	no	no	no		n/k	no	poss	Site has approval and Development Brief. Known flood areas which will restrict development – site by site assessment through the Development Management process.
A(j)	Noran Avenue 15-29	B/F	Hsg	no		no					
A(j)	Bank Street, Inverpark Hotel	B/F	Hsg	no	no	no	n/k				
A(k)	Wardmill Road/Andrew Welsh Way	B/F	Hsg	no		no					
A(l)	Baltic Mill, Dens Road <sup>1</sup>	B/F	Hsg			no					Development proposals should be supported with the submission of a Flood Risk Assessment,

<sup>1</sup> Planning permission for this site was granted following the publication of the 2014 Housing Land Audit, but has been included for completeness.

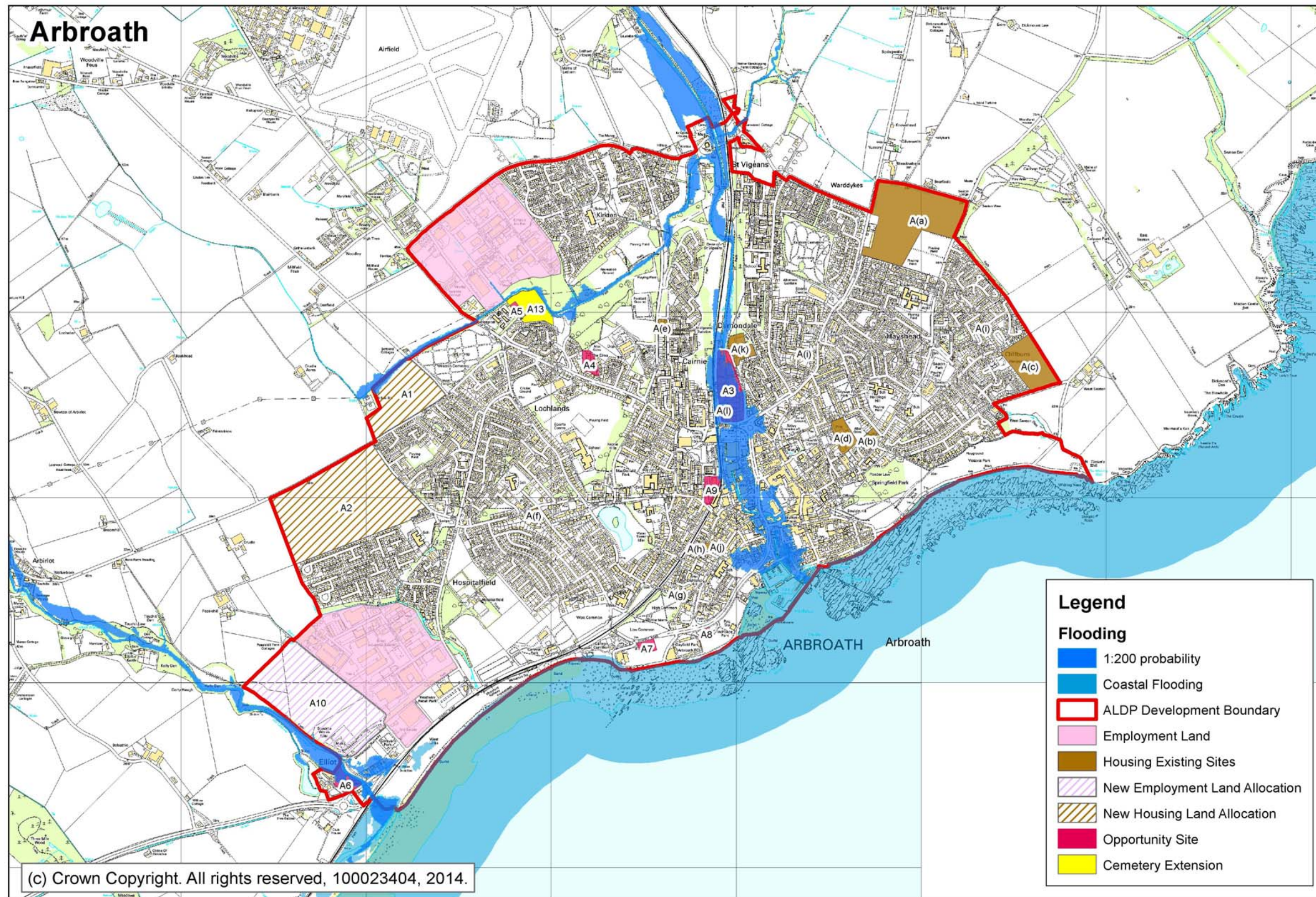
Sites Previously Identified by the Angus Local Plan Review

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
A3	Wardmill/Dens Road	B/F	Opp	yes	yes	no	The whole site is at risk of flooding. Access and egress from the area will be an issue during a flood event. We would not support the increased sensitivity of use to housing without appropriate mitigation. Currently, we would only support development here of a commercial nature which can withstand frequent flooding. An FRA would need to consider the existing risk of flooding to the site in the masterplan and design of the buildings. We are aware that there have been discussions to upgrade the flood alleviation scheme in Arbroath to an appropriate standard which may benefit this site; however there is no confirmation of funding for such a scheme at present.	n/k			Development proposals should be supported with the submission of a Flood Risk Assessment and adaptation measures and resilience to flooding through construction techniques and mitigation should be incorporated into design appropriate to proposed development type.
A4	Cairnie Road, The Elms	B/F	Opp	no	no	no	No flood risk apparent	n/k	no	no	Development Management process will apply.
A5	Little Cairnie	B/F	Opp	no					no	no	
A6	Former Bleachworks, Elliot	B/F	Opp	yes	yes	yes	Residential would increase vulnerability. Culverted watercourse through site. History of flooding in this area. FRA 2002 will need renewed. Remove from ALDP.	n/k	no	yes	Reallocated as opportunity site for business/leisure. Residential upper floor only. FRA required. Flood risk will restrict development area and uses.
A9	Helen Street Goods Yard	B/F	Opp				n/k				
A10	Elliot Industrial Estate Extension	G/F	Emp	no	yes	no					

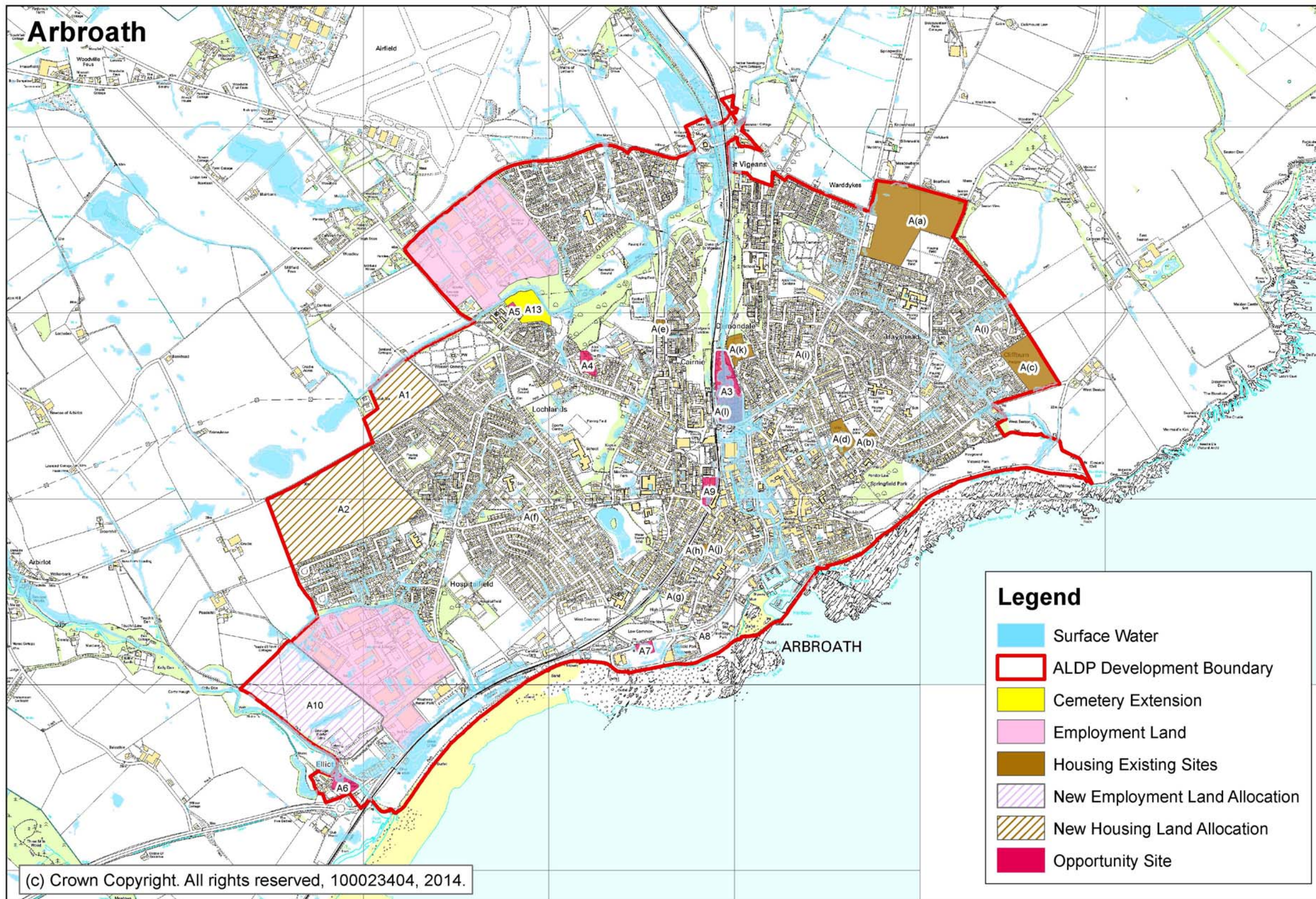
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Use	Fluvial	Surface	Coastal	SEPA Comments	F/Def	FRA	Res	STATUS/LA ACTION
A1	Crudie Acres, East Muirlands Road	G/F	Hsg	yes	yes	no		n/k	no	poss	ALDP - Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan required
A2	Crudie Farm, Arbirlot Road West (Phase 1)	G/F	Hsg	no	no	no		n/k	no	poss	ALDP – Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan required
A7	Former Seaforth Hotel	B/F	Opp	no	no	no		n/k	no	no	Redevelopment site – development management will consult with the FPA and apply ALDP policy.
A8	Former Ladyloan Primary School	B/F	Opp	no	ne	no		n/k	no	no	Redevelopment site – development management will consult with the FPA and apply ALDP policy
A13	Western Cemetery Extension	G/F	Cem	yes	yes	no		n/k	no	no	Peripheral within landscaped not burial area.

Map 2 ALDP sites / allocations in Arbroath with Coastal and 1:200 year fluvial flood data



Map 3 ALDP sites / allocations in Arbroath with pluvial data



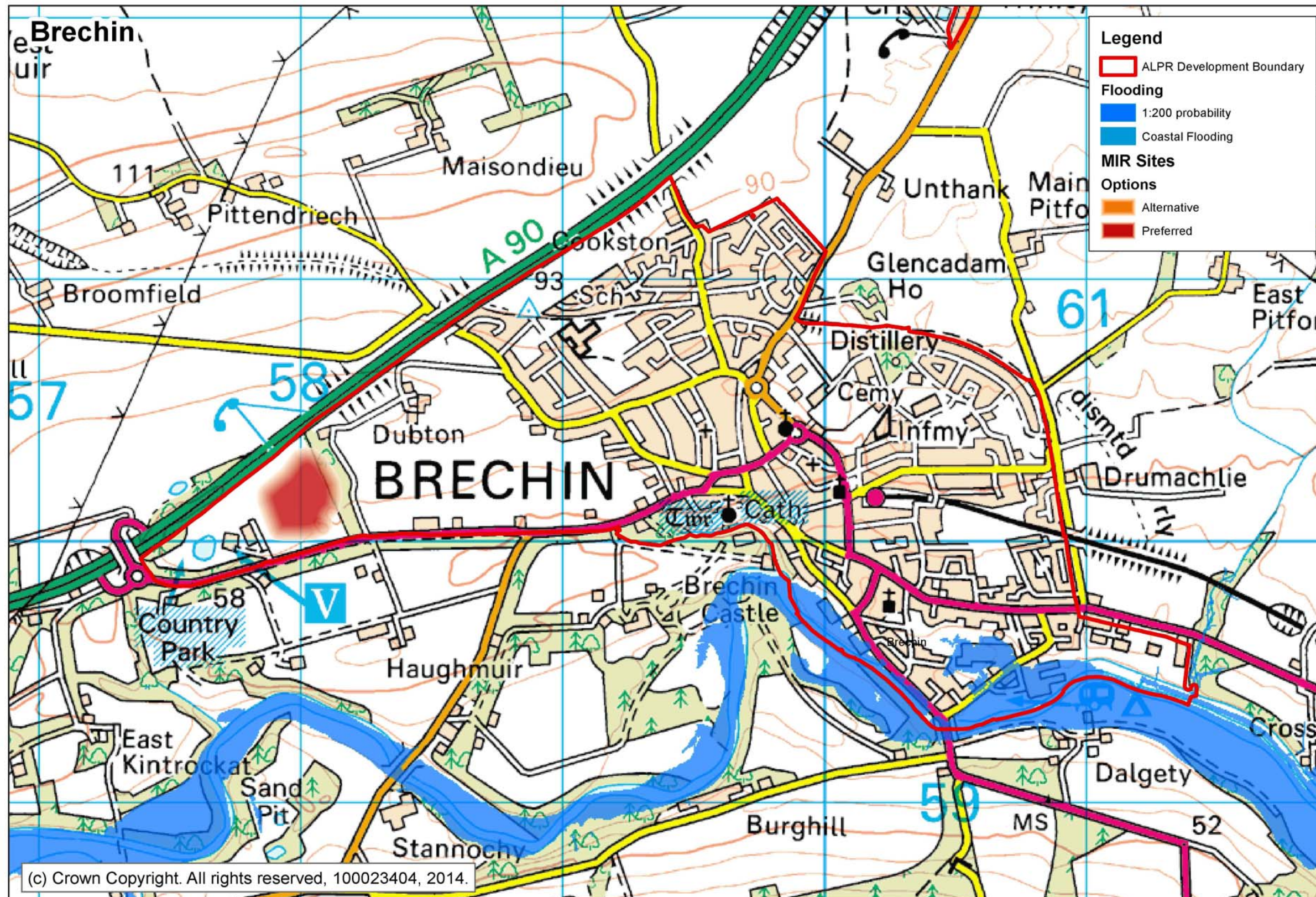


Brechin

TABLE 7 - MIR Options for Brechin

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred	Located outwith areas that are known to be at a high risk of flooding.	no	<p>Several records of flooding in Brechin associated with the South Esk. Although other records on small watercourse do exist, no specific information relating directly to the site.</p> <p>Flooding may occur in other locations and not only on the South Esk and All sources of flooding should be considered at a planning application stage</p> <p>There is a history of flooding in Brechin from the River South Esk. Angus Council has a number of flood studies available that have been carried out to support a submission for a flood prevention scheme. The largest flood in recent years occurred in 2002.</p> <p>Flooding has been recorded at the Glencadam Distillery in Brechin.</p>	<p>Continued to ALDP</p> <p>MIR text – The potential impact of flooding from the river South Esk will be addressed through a flood prevention scheme...to be complete in 2015 and will improve development opportunities in the south of the town</p>

Map 4 MIR options in Brechin with Coastal and 1:200 year fluvial flood data



**TABLE 8 – ALDP Identified and allocated sites in Brechin**  
**Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
B(a)	Bearehill/Rosehill	G/F	Hsg	no	yes	n/a	No specific information relating directly to the site.	n/k	yes	no	Under construction
B(b)	St Andrew Street, Townhead Nursery	B/F	Hsg	no	no	n/a	No flood risk apparent. Consult FPA	n/k	yes	no	Under construction
B(c)	59 Clerk Street	B/F	Hsg	no	yes	n/a	No flood risk apparent. Consult FPA	n/k	yes	no	Detailed planning Consent
B(d)	Park Road	B/F	Hsg	no	no	n/a		n/k	no	yes	Redevelopment sites – development management will consult with the FPA and apply ALDP policy.
B6	Brechin Business Park	G/F	Emp	No	yes	n/a	Any further development near the watercourses may need additional information at a planning application stage to ensure that no development occurs within the floodplain and there is no increased risk of flooding elsewhere.	n/k	yes	no	Under construction. Development process and consultation will apply to any proposed development.
	Montrose Road	B/F	Emp	no	no	n/a	All sources of flooding (including pluvial and the small watercourse should be considered at a planning application stage. The FPA should be consulted	n/k	yes	no	Existing – some development land available. Development process and consultation will apply to any proposed development.

**Sites Previously Identified by the Angus Local Plan Review**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
B1	Dubton Farm	G/F	Hsg	no	yes	n/a	All sources of flooding (including pluvial and the small watercourse should be considered at a planning application stage	n/k	yes	no	
B2	Andover School, Nursery Lane	B/F	Opp	no	no	n/a					Redevelopment site – development management will consult with the FPA and apply ALDP policy
B3	Scott Street Goods Yard	B/F	Opp	no	yes	n/a	No flood risk apparent. FPA should be consulted to	n/k	no	yes	Redevelopment site – development management will consult with the FPA

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
							comment on any information they hold especially relating to current investigations and proposed mitigation for the Brechin flood alleviation scheme. There may be additional information on the consequences of the surcharging of the Barrie's and Den Burns culverted in the area and pluvial issues.				and apply ALDP policy
B4	Former Gas Works Witchden Road	B/F	Opp	no	yes	n/a	All sources of flooding should be considered and appropriate mitigation proposed in the layout and design of buildings. An FRA would investigate the Den Burn Culvert. It is unclear how this site could be developed for housing and operates as part of the Brechin Flood Alleviation Scheme (site of proposed access / sediment traps for new Den Burn Culvert to the River South Esk). Flood prevention authority needs to be consulted to comment on any information they hold especially relating to current investigations and proposed mitigation for the Brechin flood alleviation scheme. There may be additional information on the consequences of the surcharging of the Barrie's and Den Burns culverted in the area and pluvial issues. The Authority should consider carefully if this site is suitable for development	n/k	yes	no	Site identified as an Opportunity Site in the Proposed ALDP

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
							along with any space needed for the Flood Alleviation Scheme. Any housing may be significantly constrained at this location.				
B7	Brechin Cemetery Extension	G/F	Cem	no	no	n/a			no	no	Site management

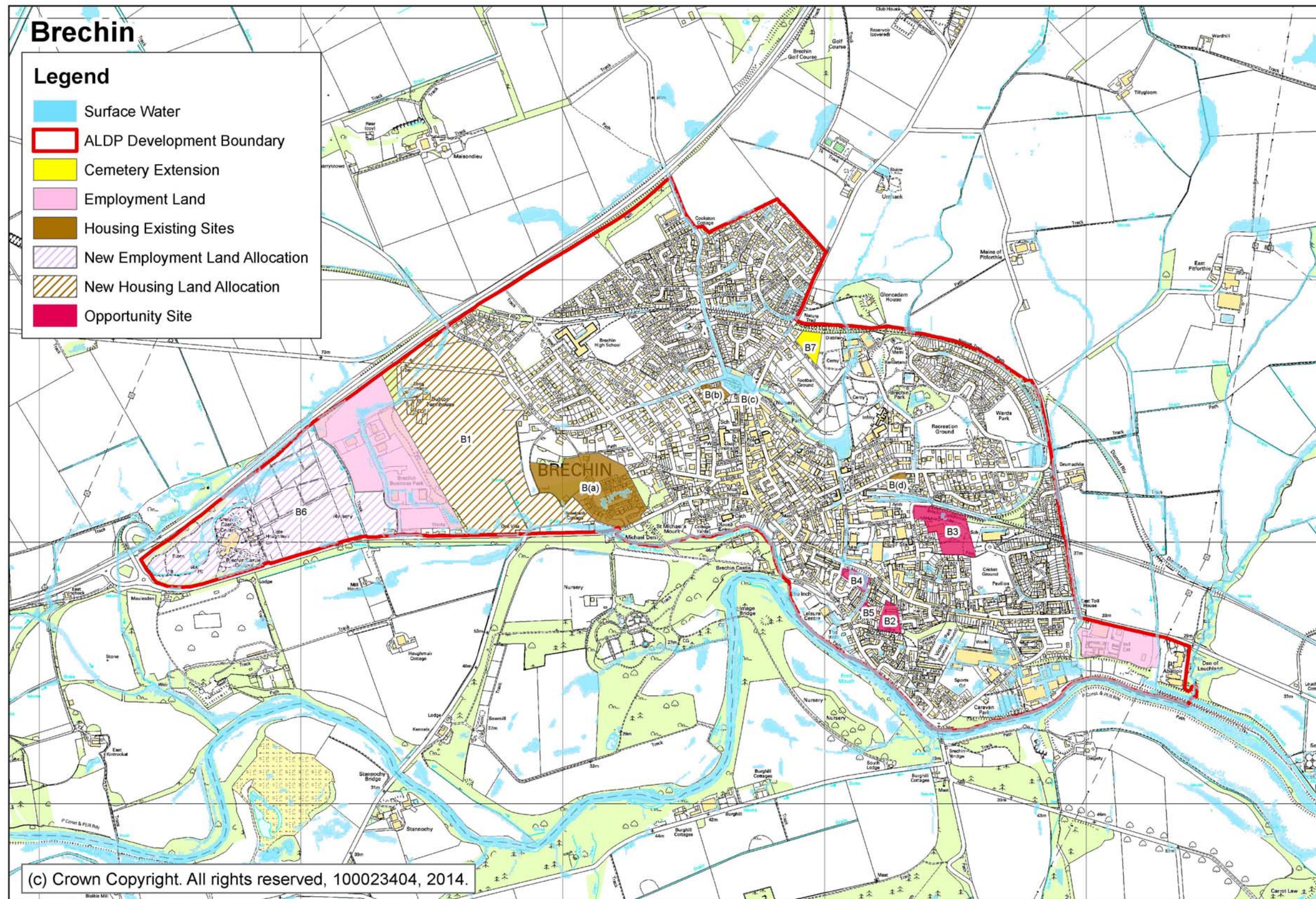
#### New ALDP allocations

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
							n/k				
B6	Brechin West	G/F	Emp	no	no			n/k	no	no	ALDP - Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan required
B5	Maisondieu Church	B/F	Opp	no	no			n/k	no	no	Redevelopment site – development management will consult with the FPA and apply ALDP policy
B8	Cookston	G/F	Open Space	no	yes				no	no	

n/k



Map 6 ALDP sites / allocations in Brechin with pluvial data



## Carnoustie

SEPA General - There is a history of flooding in Carnoustie. There is an existing flood prevention scheme on the Barry Burn. The areas covered by the flood defences include, Buddon Drive, Harris Road, Macdonald Smith Drive, Ravensby Road, Thomas Street, James Street, Taymouth Street and Watery Butts areas. The protection afforded to these areas was assessed by consultants working for the Scottish Executive in 2007. The Council's flood prevention staff should have access to the final report and flood maps from this exercise.

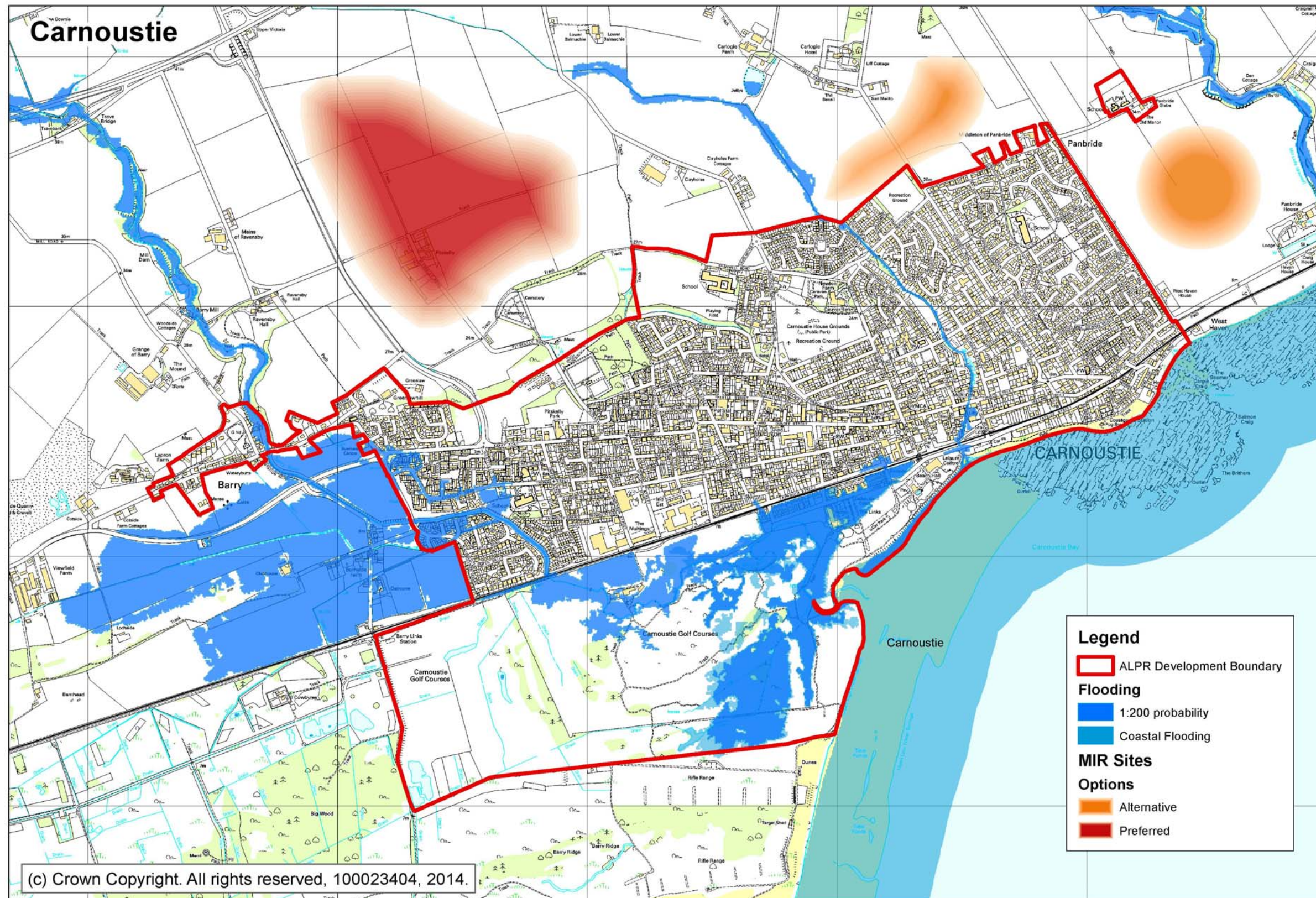
Low lying areas close to the coast may be at risk to tidal flooding.

**TABLE 9- MIR Options for Carnoustie**

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred	Most of land appears to be outwith areas known to be at a high risk of flooding	no	Record of flooding at Carnoustie High street downstream in 2009.  The extent of the site boundary is uncertain. The flood risk associated with the Lochty Burn would need to be considered but a large area is likely to be available for development.	Continued to ALDP
Alternative 1	No known high flood risk	no	Record of flooding at Carnoustie High Street downstream in 2009.  The extent of the site boundary is uncertain. The Lochty Burn is on the western boundary of the indicated area and the flood risk associated would need to be considered but a large area is likely to be available for development.	Continued to ALDP
Alternative 2	Large areas of ground to the west at risk of flooding there may be some areas which (although low lying) may be suitable if appropriate arrangements are made for the drainage of surface water.	yes	No known flood risk  A FRA would only be needed if the boundary of the development were to extend to the Craigmill Burn (currently further to the east).	Not continued to ALDP



Map 7 MIR Options in Carnoustie with Coastal and 1:200 year fluvial flood data



**TABLE 10 – ALDP Identified and allocated sites in Carnoustie  
Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
C(a)	Victoria Street, Former Maltings	B/F	Hsg	yes	yes	no	SEPA have records of flooding in the area. Flood prevention scheme built on the Barry Burn in the 1980's following the 1977 flood. Currently thought to be a 1:200 year standard of protection however there is some concern that this relies on dredging of the channel to maintain this standard (it may reduce to 1:50 if not dredged). SEPA consulted at a planning application stage and did not request any further information for flood risk issues.	n/k	no	yes	Part built.  Redevelopment site – development management will consult with the FPA and apply ALDP policy
C(b)	Burnside Street 2	B/F	Hsg	no	no	no	Consult FPA re possible culvert	yes	no	no	Detailed planning consent
C(c)	High Street 108	B/F	Hsg	no	no	no	No flood risk apparent.	n/k	no	no	Detailed planning consent
C(d)	Balmachie Road	G/F	Hsg	no	no	no	No flood risk apparent.	n/k	no	no	
C(e)	West Path, Camus House	B/F	Hsg	no	no	no			no	poss	
C(f)	North Brown Street 2 Unit 1	B/F	Hsg	no	no	no	No flood risk apparent	n/k	no	no	
C(g)	Barry Manse	B/F	Hsg	no	yes	no		n/k	no	no	Part built.

n/k

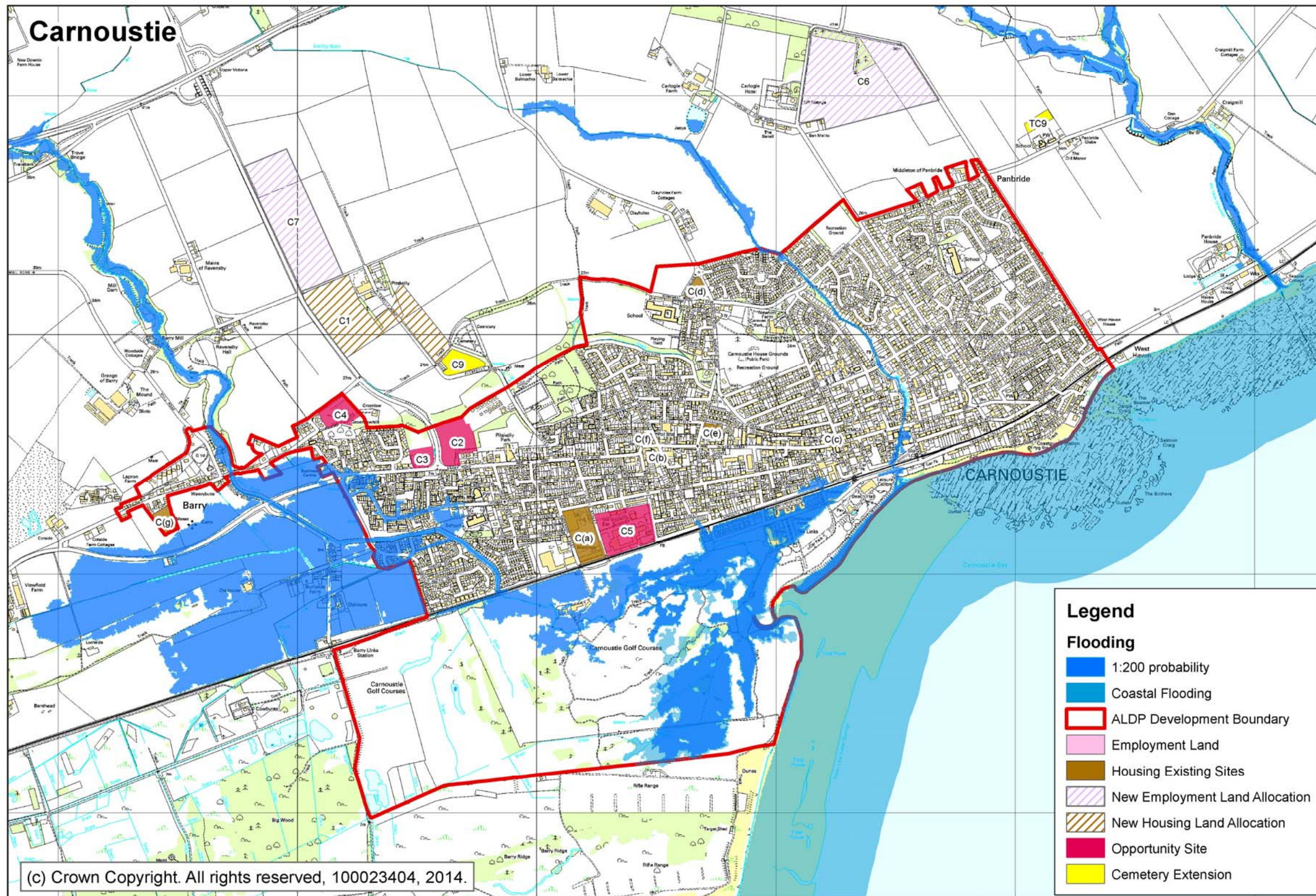
**Sites Previously Identified by the Angus Local Plan Review**

C2	Woodside/Pitskelly	B/F	Opp	no	no	no	No flood risk apparent.	n/k	no	no	
C3	Barry Road	B/F	Opp	no	no	no	An assessment would investigate all sources of flooding, including pluvial and the culverted small watercourse (which may be part of a SUDS with unknown discharge point).	n/k	yes	no	Redevelopment sites – development management will consult with the FPA and apply ALDP policy.
C4	Greenlaw Hill	B/F	Opp	no	no	no	No flood risk apparent.	n/k	no	no	
C6	Land at Carlogie	G/F	Emp				No flood risk apparent.				Has planning permission in principle. Sustainable Drainage and Surface Water Management Plan and Flood Risk assessment required
C9	Shanwell Cemetery Extension	B/F	Opp	no							
C10	Sports Ground, Shanwell Road	B/F	Opp	no	no						

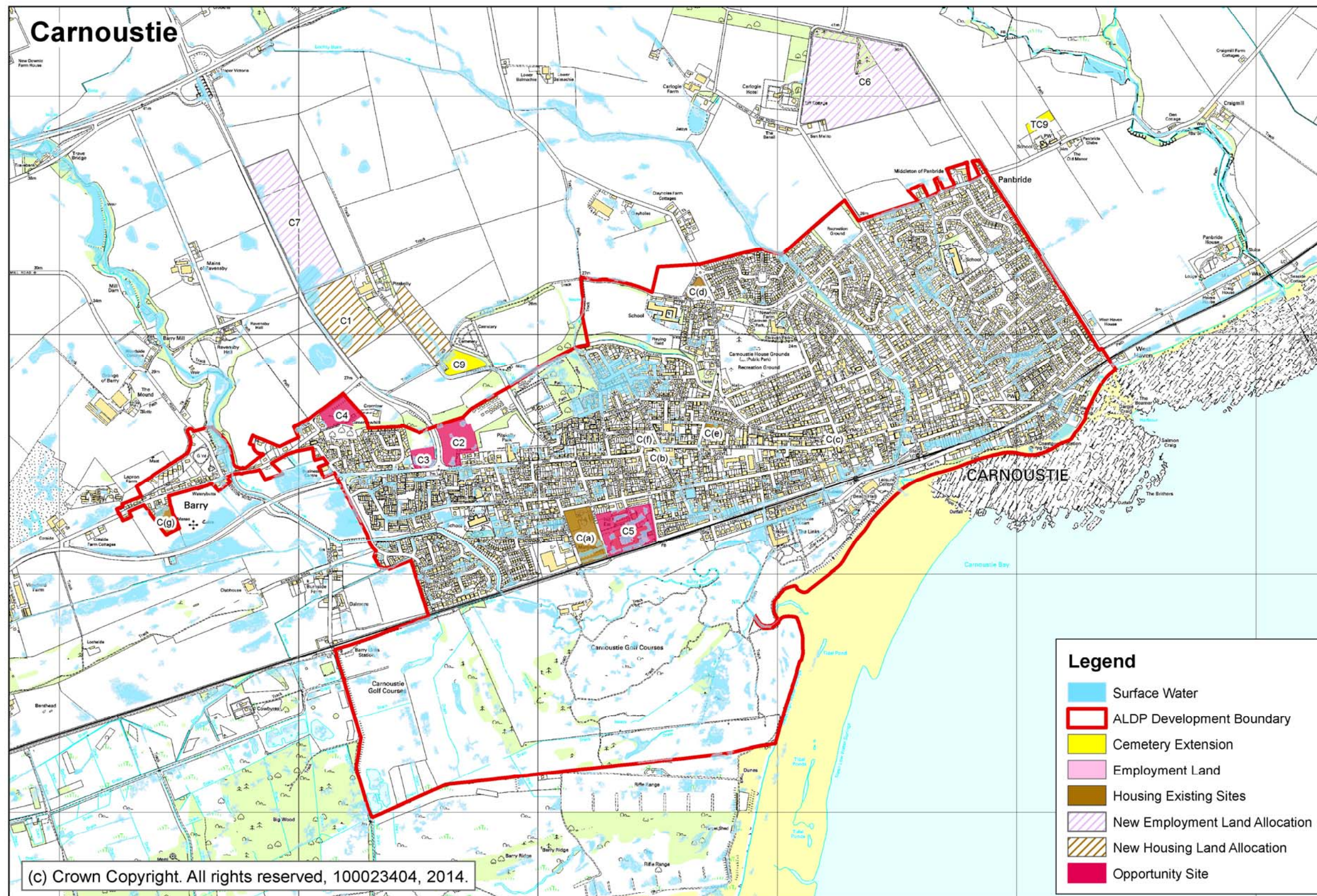
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
C1	Land at Pitskelly	G/F	Hsg	no	no	no			no	no	Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan, Flood Risk Assessment required.
C5	Panmure Industrial Estate	B/F	Opp	no	no	no	Identification of surface water ponding.				Redevelopment site – development management will consult with the FPA and apply ALDP policy to address surface water management.
C7	Land at Pitskelly	G/F	Emp	no	no	no		n/k	no	no	Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan, Flood Risk Assessment required.

Map 8 ALDP sites / allocations in Carnoustie with Coastal and 1:200 year fluvial flood data



Map 9 ALDP sites / allocations in Carnoustie with pluvial data

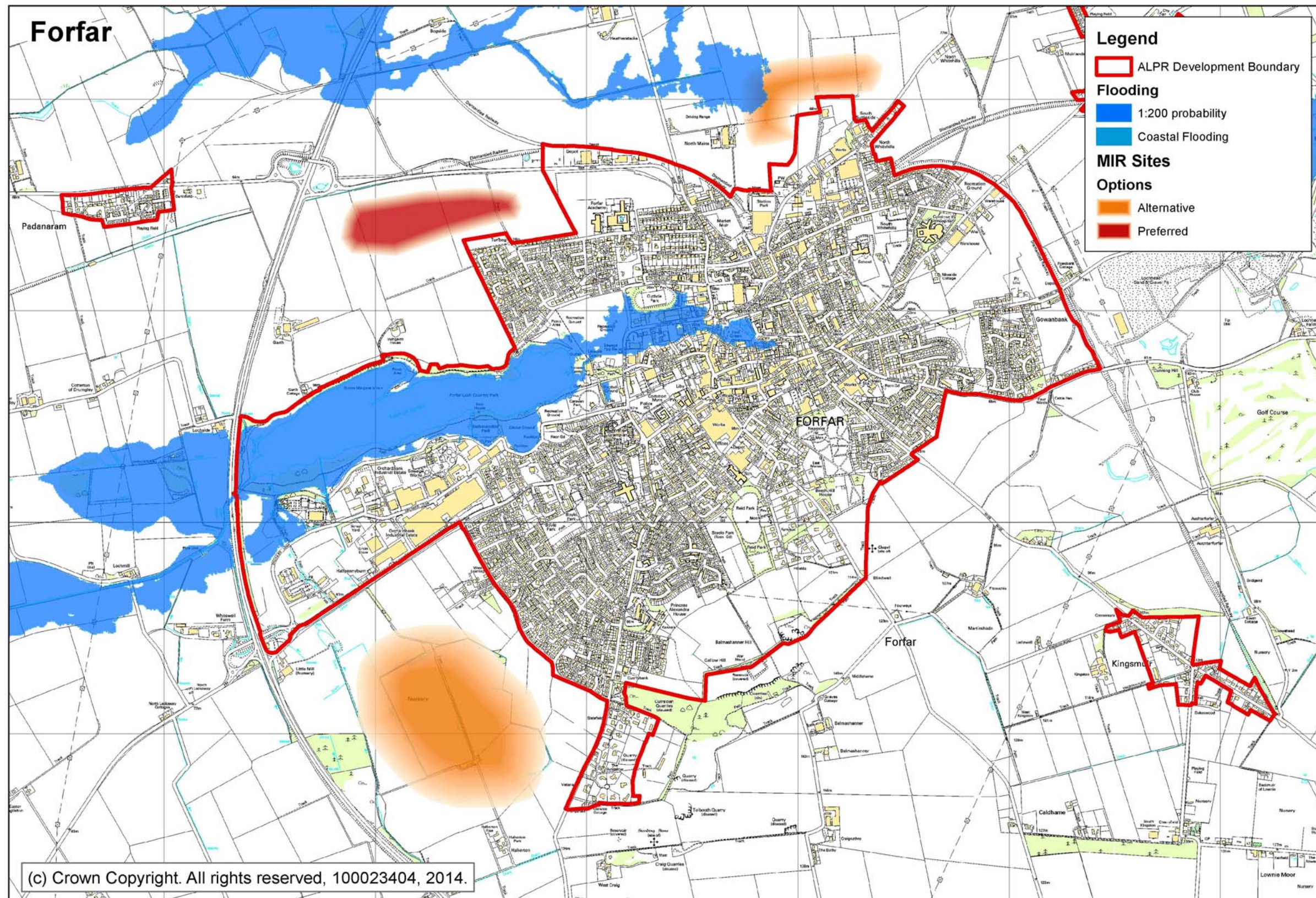


**Forfar**

**TABLE 11 - MIR Options for Forfar**

<b>Option</b>	<b>LA Comment</b>	<b>Fluvial 1:200</b>	<b>SEPA Comment</b>	<b>Action</b>
Preferred	Does not contain any land known to be at a high risk of flooding Surface water management will require particular attention – water quality of Forfar loch	no	No known flood risk  No flood risk apparent.	Continued to ALDP
Alternative 1	No flood risk issue Water quality of Dean Water	no	No known flood risk  Need to account for the several small watercourses within the site boundary however large areas are likely to be available for development Small watercourses and river crossings would need to be accounted for.	Continued to ALDP
Alternative 2	No flood risk issue	no	No known flood risk  FRA needed if the boundary of the development were to extend to the Lemno Water or included the small watercourse to the east	Not continued to ALDP

Map 10 MIR Options in Forfar with Coastal and 1:200 year fluvial flood data



**TABLE 12 – ALDP Identified and allocated sites in Forfar**  
**Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
F(a)	Turfbeg Farm	G/F	Hsg	no	no	n/a	No flood risk apparent	n/k	no	no	Under construction
F(b)	New Road	B/F	Hsg	no	no	n/a					
F(c)	Wester Restenneth	G/F	Hsg	no	yes	n/a					Under construction
F(a)	Dundee Road	B/F	Hsg	no	no	n/a	Historical record – sewer flooding 2007 Refer to Flood Prevention officer	n/k	no	yes	Redevelopment sites – development management will consult with the FPA and apply ALDP policy.
F(d)	Slatefield Rise (Phase 2)	G/F	Hsg	no	no	n/a	Consult flood prevention authority	n/k	no	poss	
F(f)	Queen Street Pavilion	B/F	Hsg	no	no	n/a			no		Redevelopment site – development management will consult with the FPA and apply ALDP policy.
F(g)	Roberts Street	B/F	Hsg	no	no	n/a					Redevelopment site – development management will consult with the FPA and apply ALDP policy.
F9	Orchardbank (21.6)	G/F	Emp	yes	yes	n/a	n/k	n/k	no	poss	Site has approval and Development Brief. Known flood areas which will restrict development – site by site assessment through the Development Management process.

**Sites Previously Identified by the Angus Local Plan Review**

n/k

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
F2	Gowanbank	B/F	Hsg	no	yes	n/a	Refer to Flood Prevention officer	n/k			ALDP - Foul drainage arrangements for the site should be agreed in writing with Scottish Water.
F5	South Street (0.8ha)	B/F	Hsg	no	yes	n/a	Historical record – pluvial 1887	n/k	no	yes	Redevelopment site – development management will consult with the FPA and apply ALDP policy.
F10	Carseview Road (4ha)	G/F	Emp	no	yes	n/a			no	no	
F11	Newmonthill Cemetery Extension (1.7ha)	G/F	Cem	no	yes	n/a			no	no	Site management

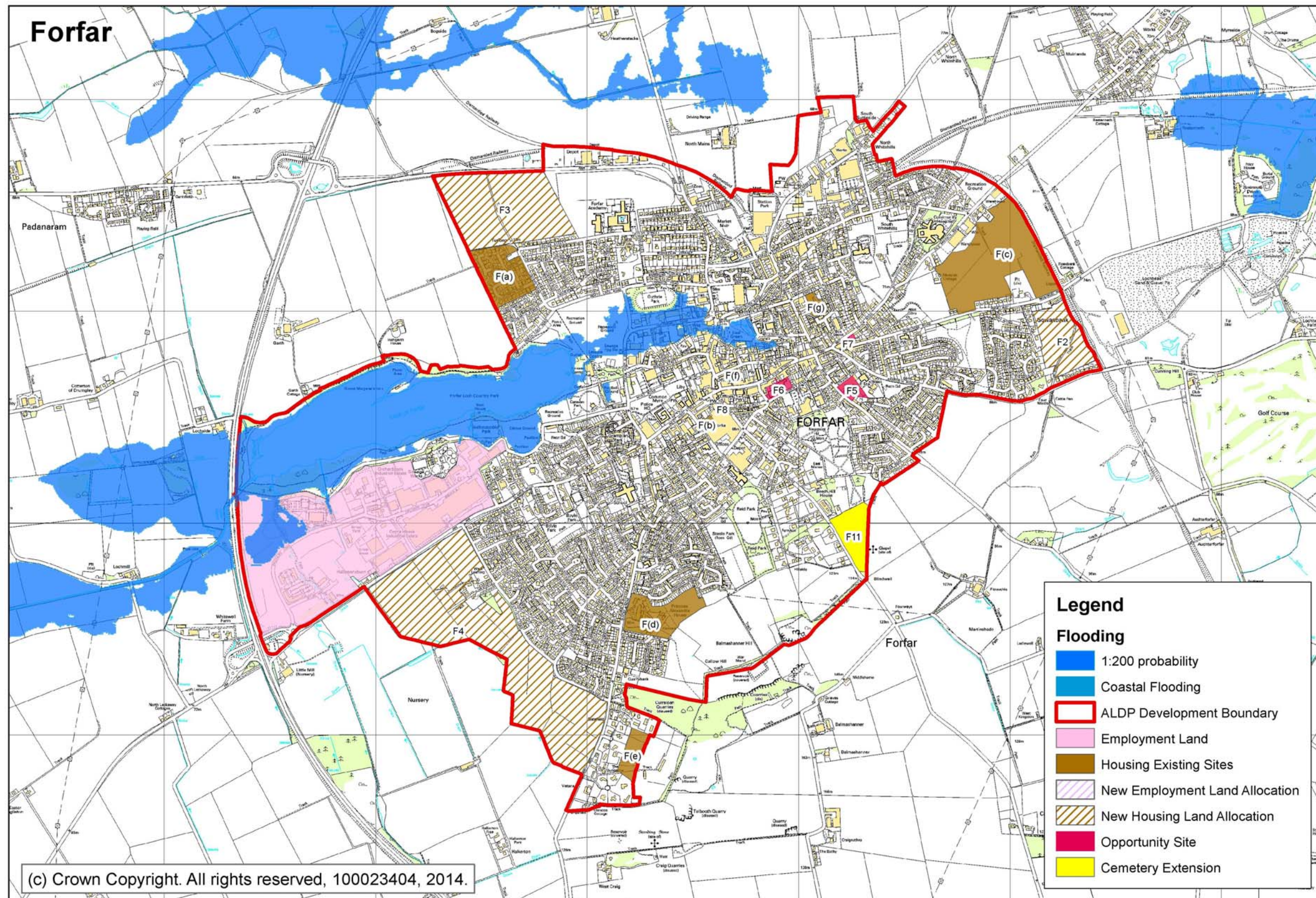
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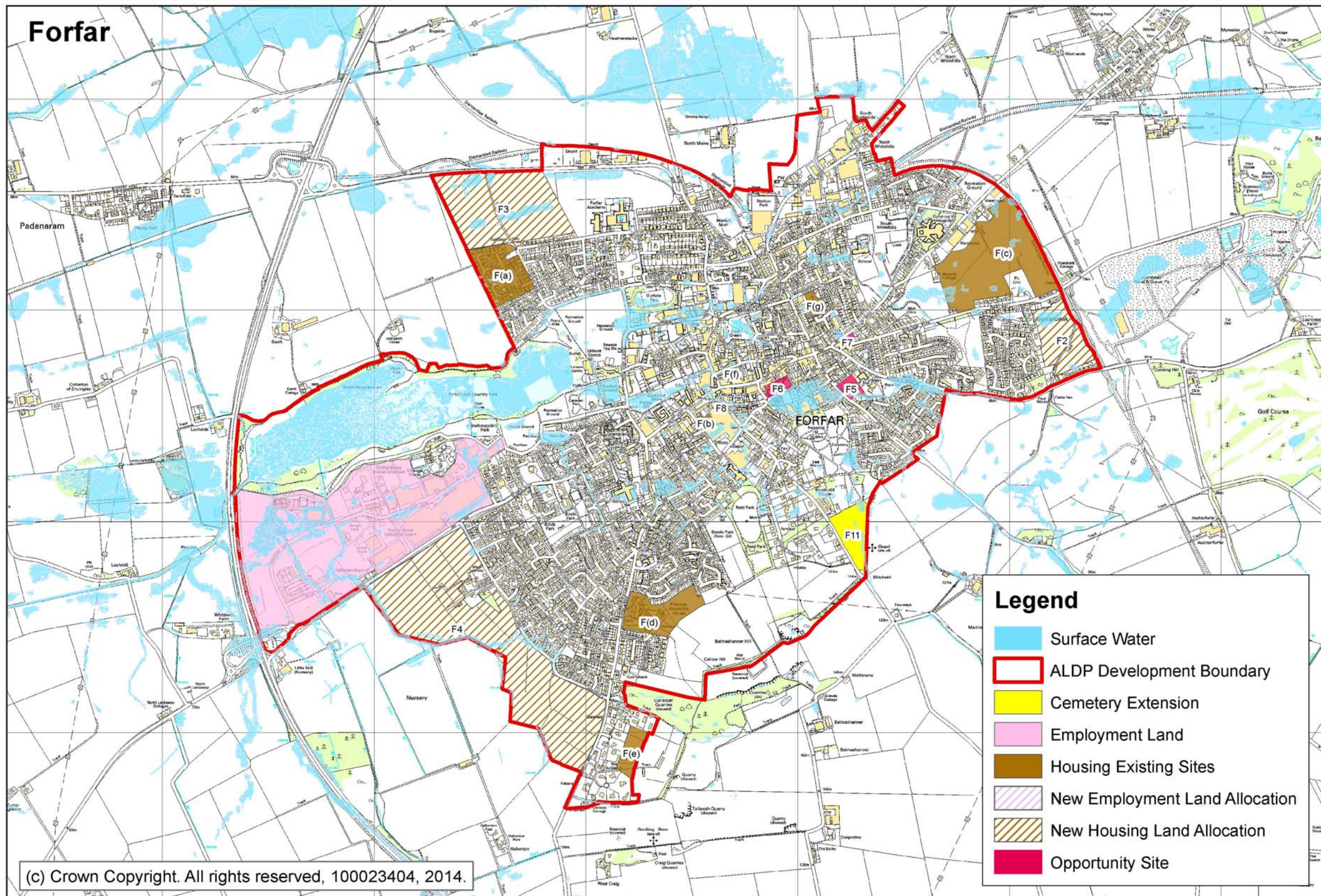
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
F3	Turfbeg (17.6ha)	G/F	Hsg	no	yes	n/a		n/k	no	poss	ALDP - Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan
F4	Westfield (38.8ha)	G/F	Hsg	no	yes	n/a		n/k	no	poss	ALDP - Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan
F6	Former Chapelpark School (0.5ha)	B/F	Opp	no	no	n/a		n/k	no	no	Redevelopment site - development management will consult with the FPA and apply ALDP policy.
F7	Former Music Centre (0.2ha)	B/F	Opp	no	yes	n/a		n/k	no	no	Redevelopment site - development management will consult with the FPA and apply ALDP policy.
F8	Forfar Swimming Pool (0.1ha)	B/F	Opp	no	yes	n/a		n/k	no	no	Redevelopment site - development management will consult with the FPA and apply ALDP policy

Map 11 ALDP sites / allocations in Forfar with Coastal and 1:200 year fluvial flood data



Map 12 ALDP sites / allocations in Forfar with pluvial data



## Kirriemuir

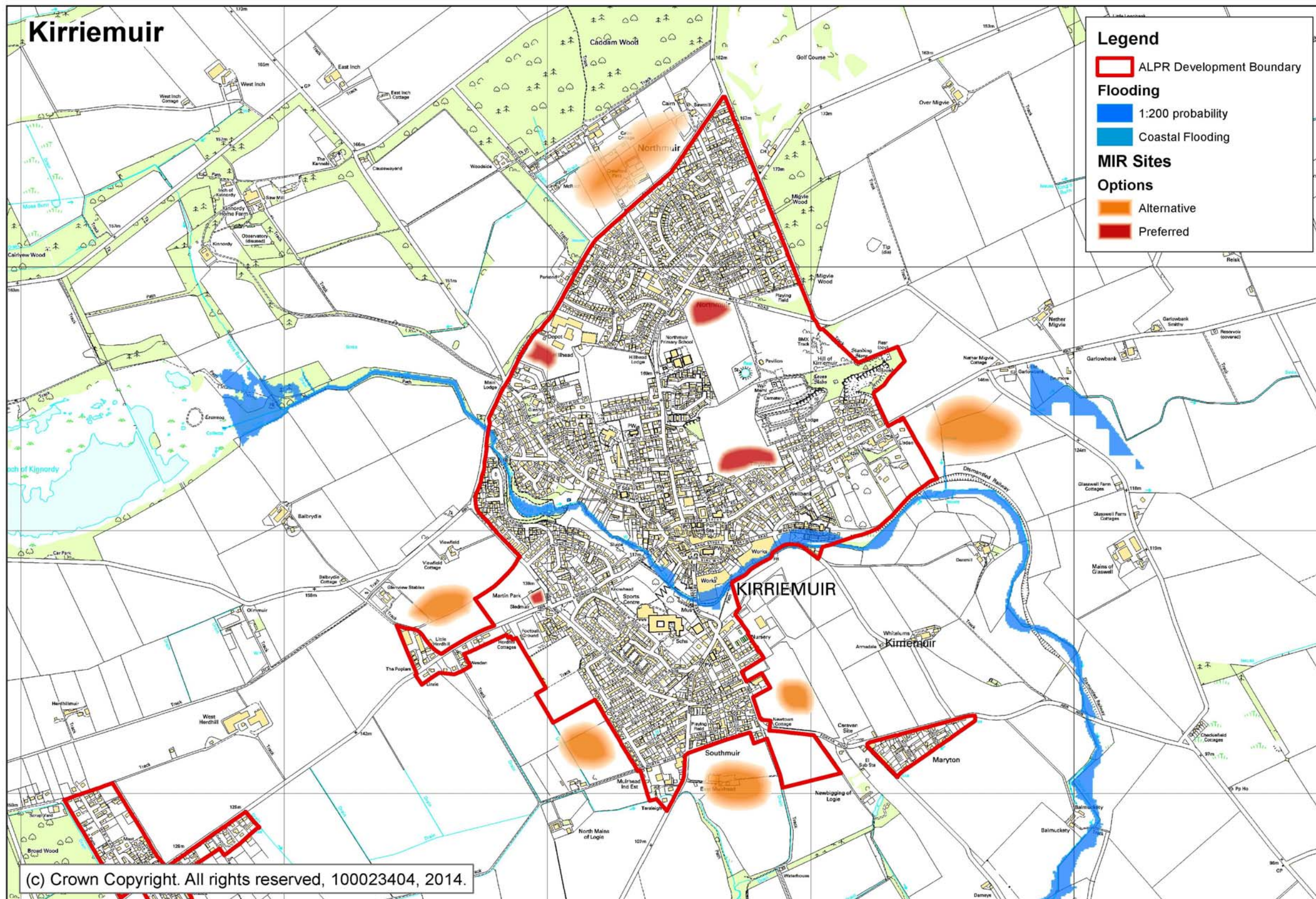
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SEPA general - There is a flood prevention scheme on the Gairie Burn however this does not meet the current standards of protection and future proposals for development will require to consider the risk of flooding.

TABLE 13 - MIR Options for Kirriemuir

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred	Option areas do not include any land that is known to be at a high risk of flooding	no	No known flood risk.	Continued to ALDP
Alternative 1	Does not contain any areas known to be at a high risk of flooding	no	No known flood risk. Small watercourse would need to be considered in any FRA along with all sources of flooding.	Continued to ALDP Added to ALDP Dec 2014
Alternative 2	Does not contain any areas known to be at a high risk of flooding	no	No known flood risk. Small watercourse would need to be considered in any FRA along with all sources of flooding.	Not continued to ALDP
Alternative 3	Does not contain any areas known to be at a high risk of flooding	no	No known flood risk. Small watercourse would need to be considered in any FRA along with all sources of flooding.	Not continued to ALDP

Map 13 MIR Options in Kirriemuir with Coastal and 1:200 year fluvial flood data



**TABLE 14 – ALDP Identified and allocated sites in Kirriemuir  
Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
K(a)	Westfield/Lindsay Street	G/F	Hsg	no	no	n/a	No flood risk apparent	n/k	no	no	Detailed Planning Consent
K(b)	Sunnyside	G/F	Hsg	no	no	n/a	Refer to FPA	n/k	no	yes	Detailed Planning Consent
K(c)	Hillhead	G/F	Hsg	no	no	n/a	No flood risk apparent	n/k	no	no	Under construction
K(d)	Platten, Brechin Road	G/F	Hsg	no	yes	n/a	No flood risk apparent	n/k	no	no	Under construction
K(e)	19 Glengate Hall, Glengate	B/F	Hsg	no	no	n/a	No flood risk apparent	n/k	no	no	Conversion - development management will consult with the FPA and apply ALDP policy.
K(f)	Pathhead Nursery, Forfar Road	B/F	Hsg	no	no	n/a	No flood risk apparent	n/k	no	no	Under construction
K(g)	Former Workshop & Yard, Cortachy Road	B/F	Hsg	no	no	n/a			no		Redevelopment sites – development management will consult with the FPA and apply ALDP policy.
	North Mains of Logie	G/F	Emp	no	no	n/a	No flood risk apparent	n/k	no	No	Existing employment site
	Muirhead Industrial Estate	G/F	Emp	no	no	n/a	An assessment could consider the risk of flooding from the small watercourse on the boundary of the site	n/k	no	Yes	Under construction

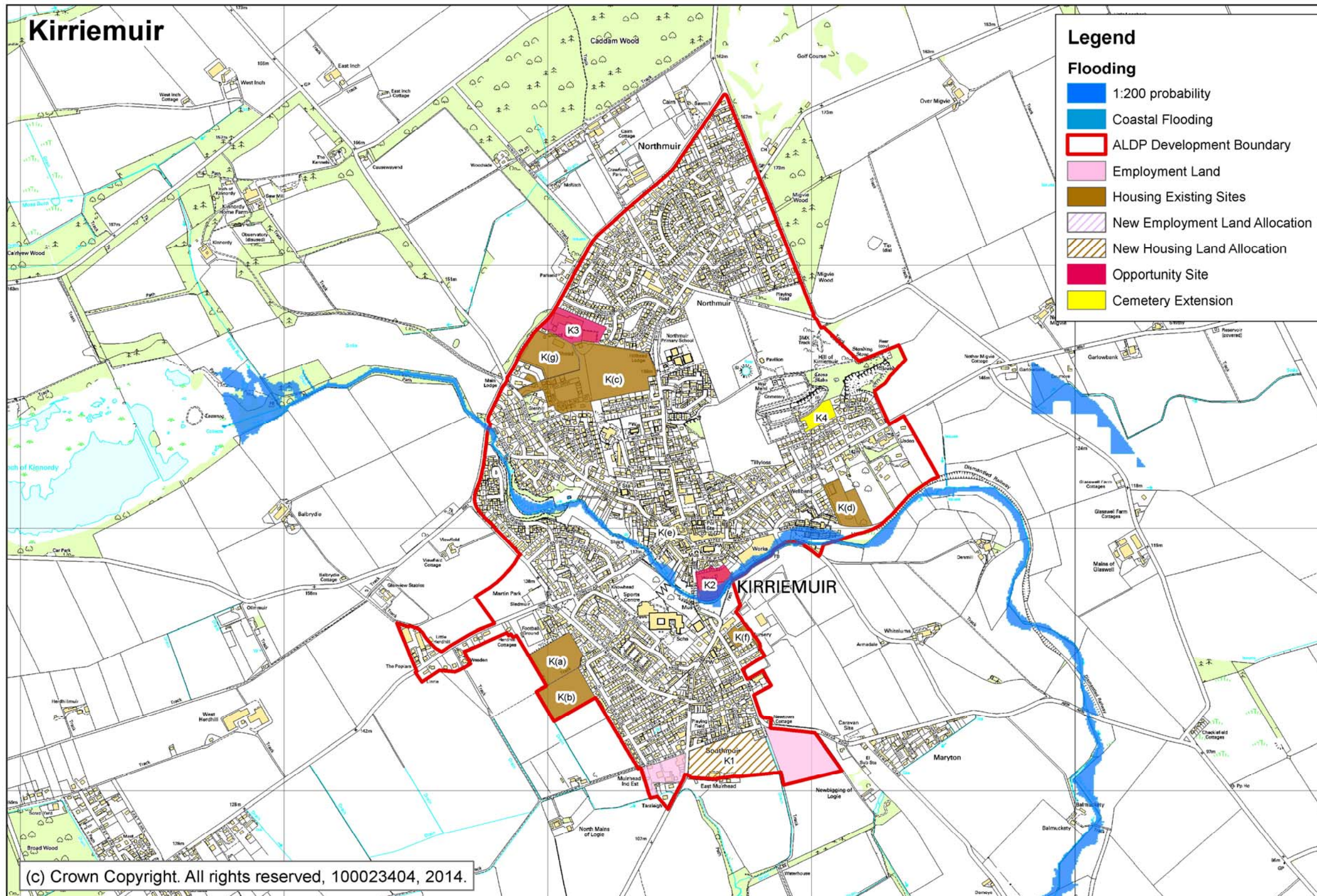
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**Sites Previously Identified by the Angus Local Plan Review**

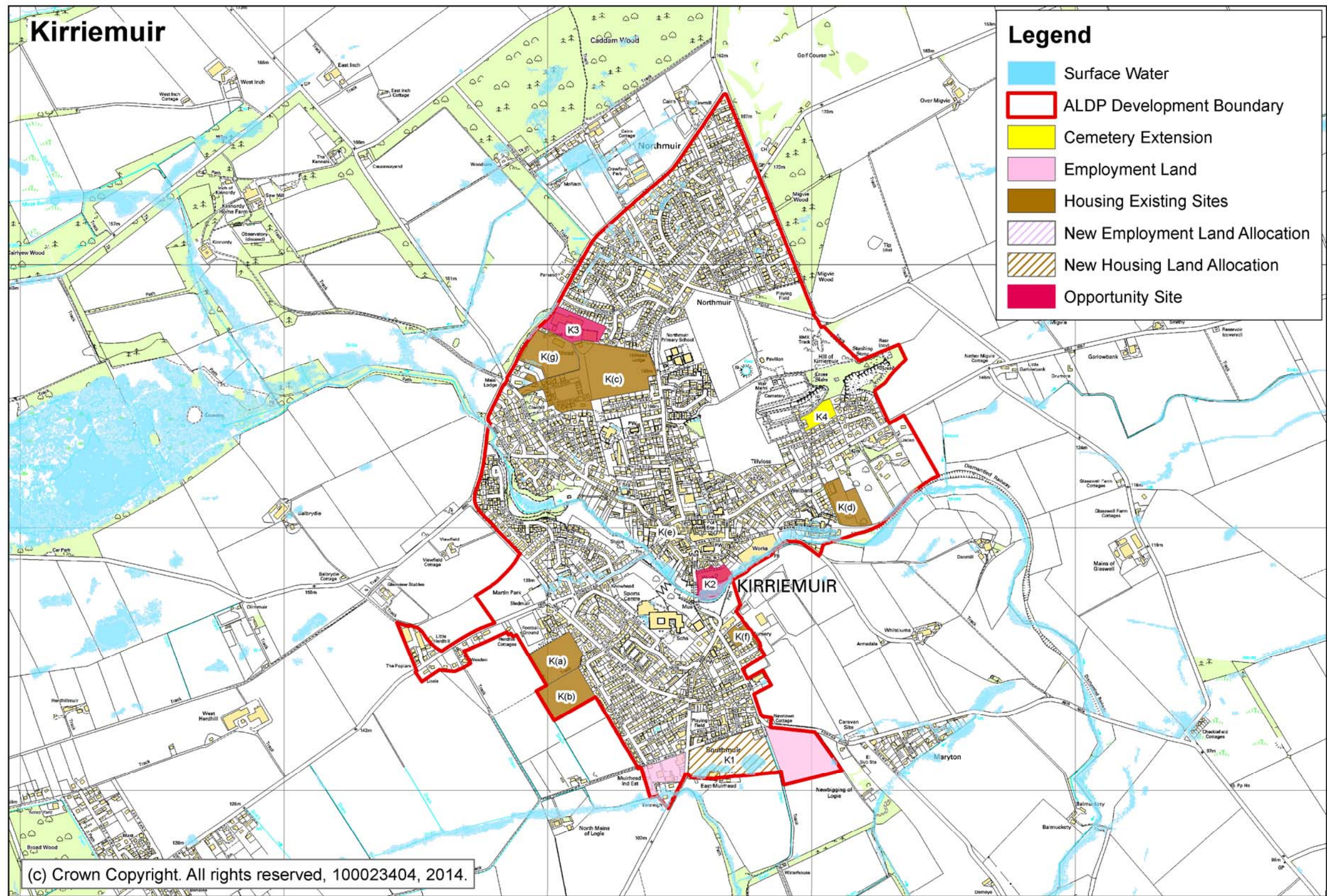
Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
K1	Land South of Beechwood Place	G/F	Hsg	no	no	n/a	No known flood risk. Small watercourse would need to be considered in any FRA along with all sources of flooding.	n/k	no	No	Surface water management plan required.
K2	Gairie Works	B/F	Opp	no	no	n/a	Historical record – pluvial 1887	n/k	no	Yes	ALDP - Flood Risk Assessment, and Drainage Impact Assessment,
K3	Land at Cortachy Road	BF	Opp	no	no	n/a			no	No	
K4	Kirriemuir Cemetery Extension	G/F	Cem	no	no	n/a			no	No	

n/k

Map 14 ALDP sites / allocations in Kirriemuir with Coastal and 1:200 fluvial flood data



Map 15 ALDP sites / allocation in Kirriemuir with pluvial data





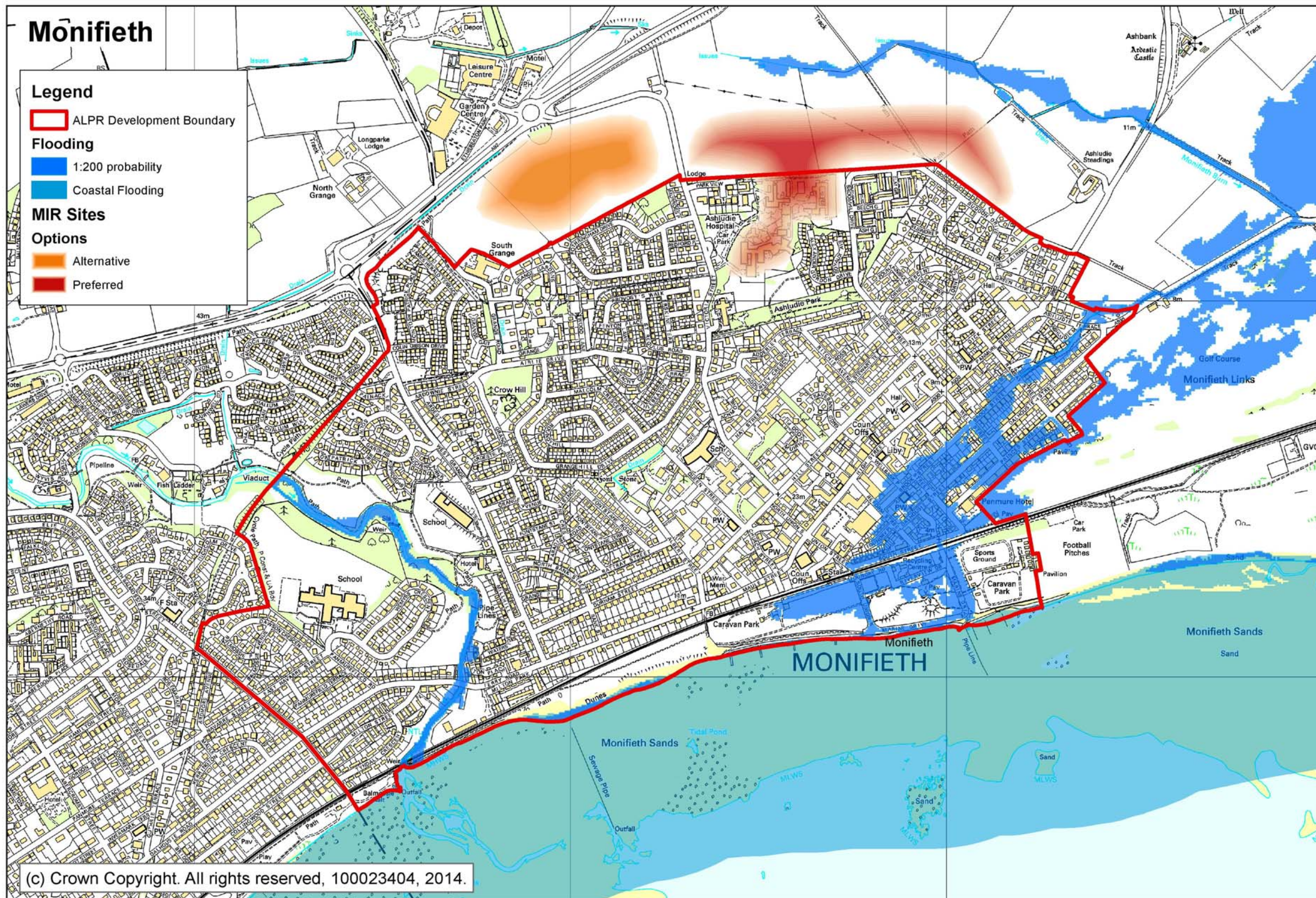
## Monifieth

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TABLE 15 - MIR Options for Monifieth

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred	- Most of land appears to be outwith areas known to be at a high risk of flooding - Masterplan to ensure drainage of surface water in a sustainable manner.	no	No known flood risk. The Monifieth Burn - the flood risk associated with this watercourse has not been fully identified and would need to be considered but a large area is likely to be available for development.	Not continued to ALDP
Alternative 1	No known areas of high flood risk	no	No known flood risk – FRA may need to consider small watercourse adjacent to A92	Continued to ALDP

Map 16 MIR Options in Monifieth with Coastal and 1:200 year fluvial flood data



**TABLE 16 – ALDP Identified and allocated sites in Monifieth**

SEPA General - In March 2009 there was some damage to the coastline by higher than normal tides.  
In September 2009 there was flooding of properties in the Milton Place area from high water levels in the Dighty Water.

**Sites with planning permission or under construction**

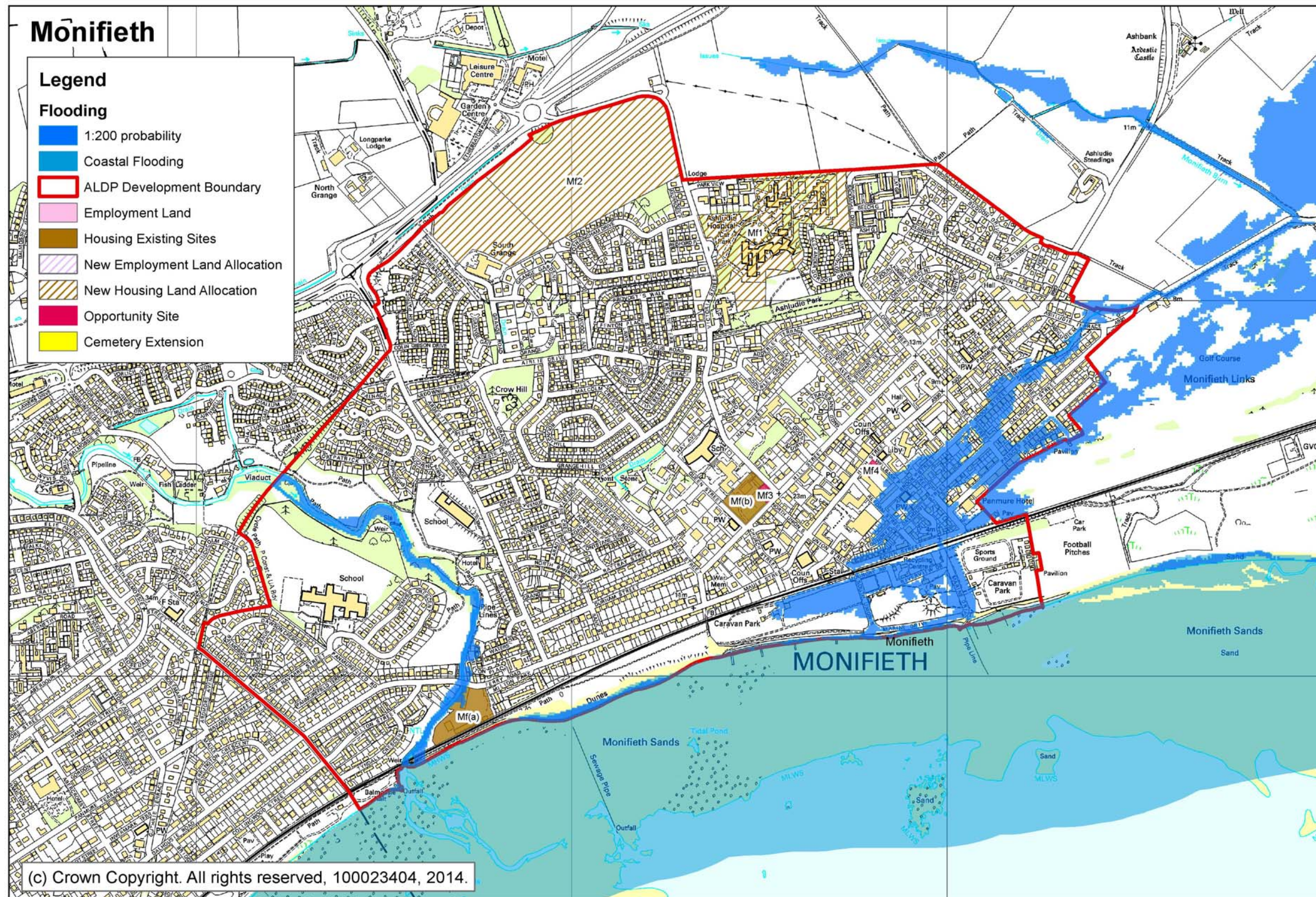
Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
Mf(a)	Milton Mill	B/F	Hsg	yes	yes	no	Historical record of flooding. SEPA commented on proposed floor levels at this location. This allocation is constrained in some parts of the site. Noted that this site may already be under construction. Potential to increase flooding downstream.	n/k	no	yes	Under construction
Mf(b)	Former Nursery, Victoria Street	B/F	Hsg								

**No Sites Previously Identified by the Angus Local Plan Review**

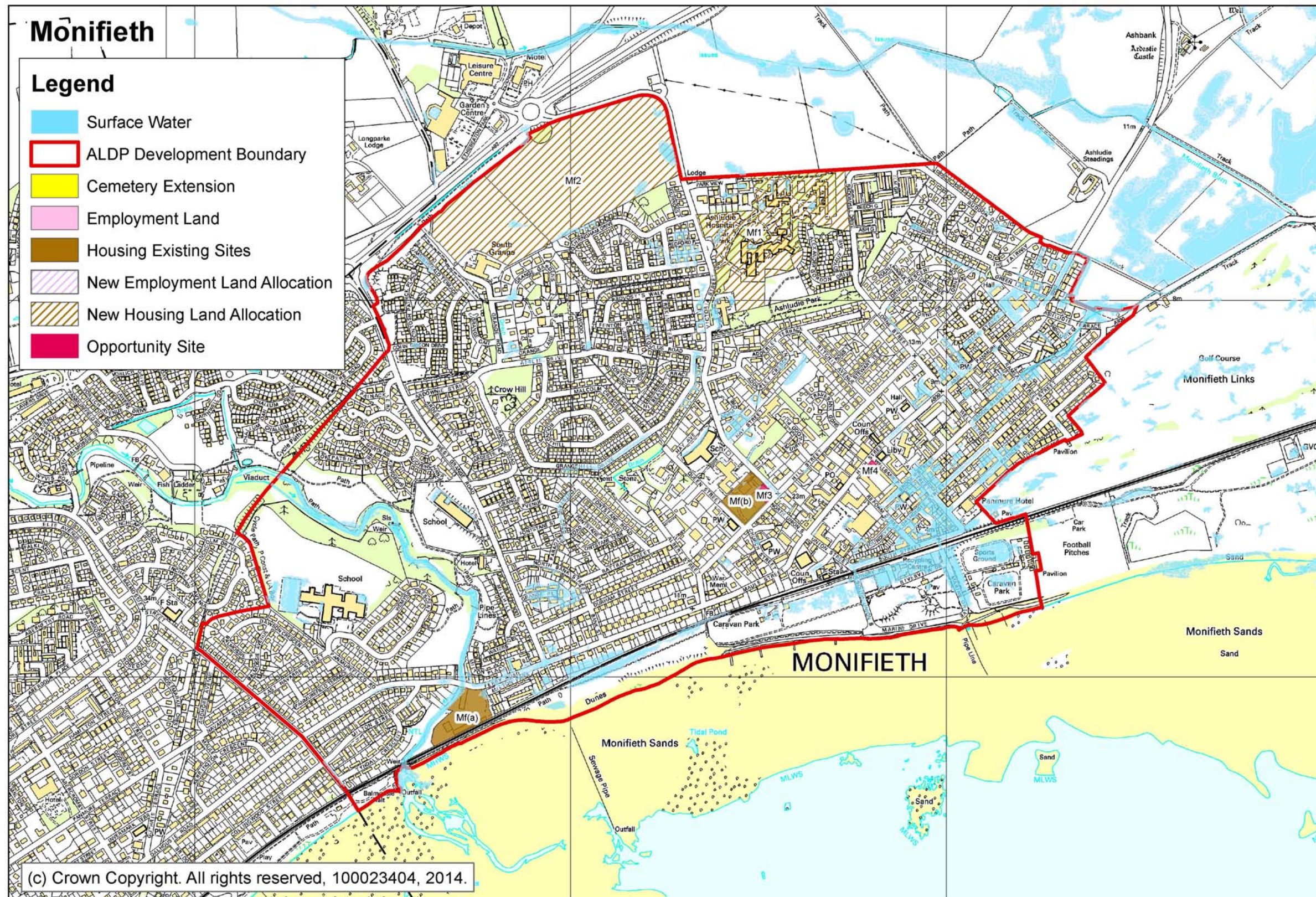
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
Mf1	Ashludie Hospital	G/F	Hsg	no	yes	no	historical record of flooding on Milton Place from the Dighty in 2009. SEPA commented on proposed floor levels at this location. Allocation is constrained in some parts of the site	n/k	no	no	
Mf2	Land west of Victoria Street	G/F	Hsg	no	no	no	No known flood risk – FRA may need to consider small watercourse adjacent to A92	n/k	no	no	Planning consent
Mf3	Former Petrol Filling Station, High Street	B/F	Opp	no	yes	no		n/k	no	no	Redevelopment sites – development management will consult with the FPA and apply ALDP policy.

Map 17 ALDP sites / allocations in Monifieth with Coastal and 1:200 year fluvial flood data



Map 18 ALDP sites / allocations in Monifieth with pluvial data

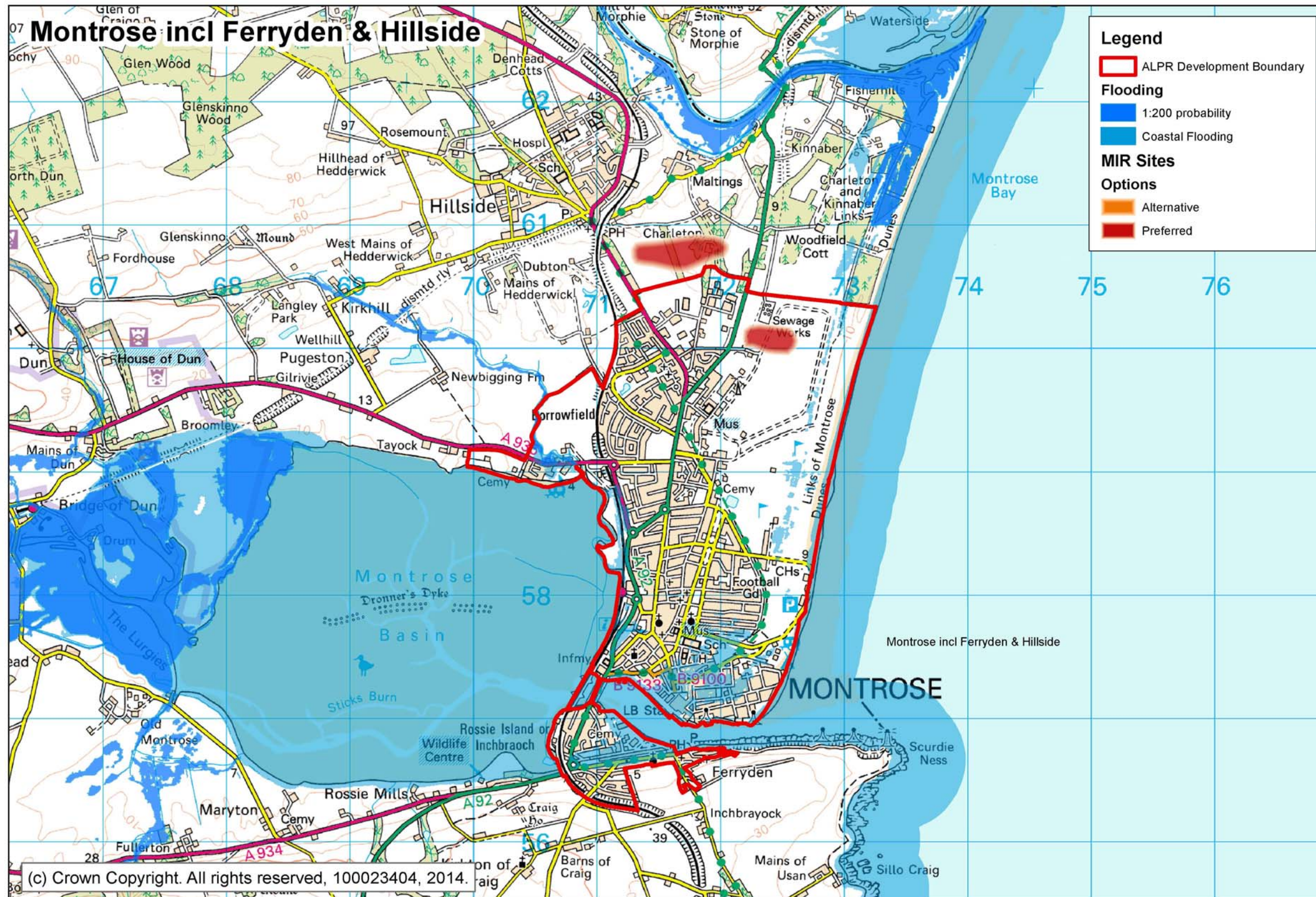


## Montrose including Ferryden and Hillside

TABLE 17 - MIR Options for Montrose including Ferryden and Hillside

Option	LA Comment	Fluvial 1:200	Coastal	SEPA Comment	Action
Preferred	Employment land only – outwith areas known to be at high risk of flooding and avoidance of areas that could be at risk from future coastal erosion.	no	Yes peripheral	No known flood risk.  Coast - consider the issue of erosion during high storm surges and with regard to the Angus Shoreline Management Plan. Consider need for specialist advice regarding erosion risks at this location to define if it is vulnerable to erosion and if development is appropriate.	Continued to ALDP

Map 19 MIR options in Montrose with Coastal and 1:200 year fluvial flood data



**TABLE 18 – ALDP Identified and allocated sites in Montrose**  
**Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
M(a)	Brechin Road (Phase 1)	G/F	Hsg	No	yes	no				no	Under construction
M(b)	Hill Place	B/F	Hsg	No	no	no	Historical records of flooding in the town. No flood risk apparent - Refer to Flood Prevention Officer if further information required.	n/k	no	yes	Under construction
M(c)	Croft Road	G/F	Hsg	No	no	no	Historical records of flooding in the town. Proximity to coast noted. Refer to Flood Prevention Officer if further information required.	n/k	no	yes	Under construction
M(d)	Wishart Gardens	B/F	Hsg	No	yes	no	Historical records of flooding in the town but no apparent flood risk at this site.	n/k	no	no	Under construction
M(e)	Lower Hall Street	G/F	Hsg	No	no	no	Historical records of flooding in the town but no apparent flood risk at this site.	n/k	no	no	Under construction
M(f)	Bridge Street	B/F	Hsg	No	yes	no	Historical records of flooding in the town but no apparent flood risk at this site.	n/k	no	yes	Under construction
M(g)	Waldron Road, Former Drexel Workshop	B/F	Hsg	No	no	no	Historical records of flooding in the town but no apparent flood risk at this site.	n/k	no	no	Detailed planning consent
M(h)	Broomfield Road	B/F	Mixed	No	no	no	Historical records of flooding in the town but no apparent flood risk at this site.	n/k	no	no	Under construction



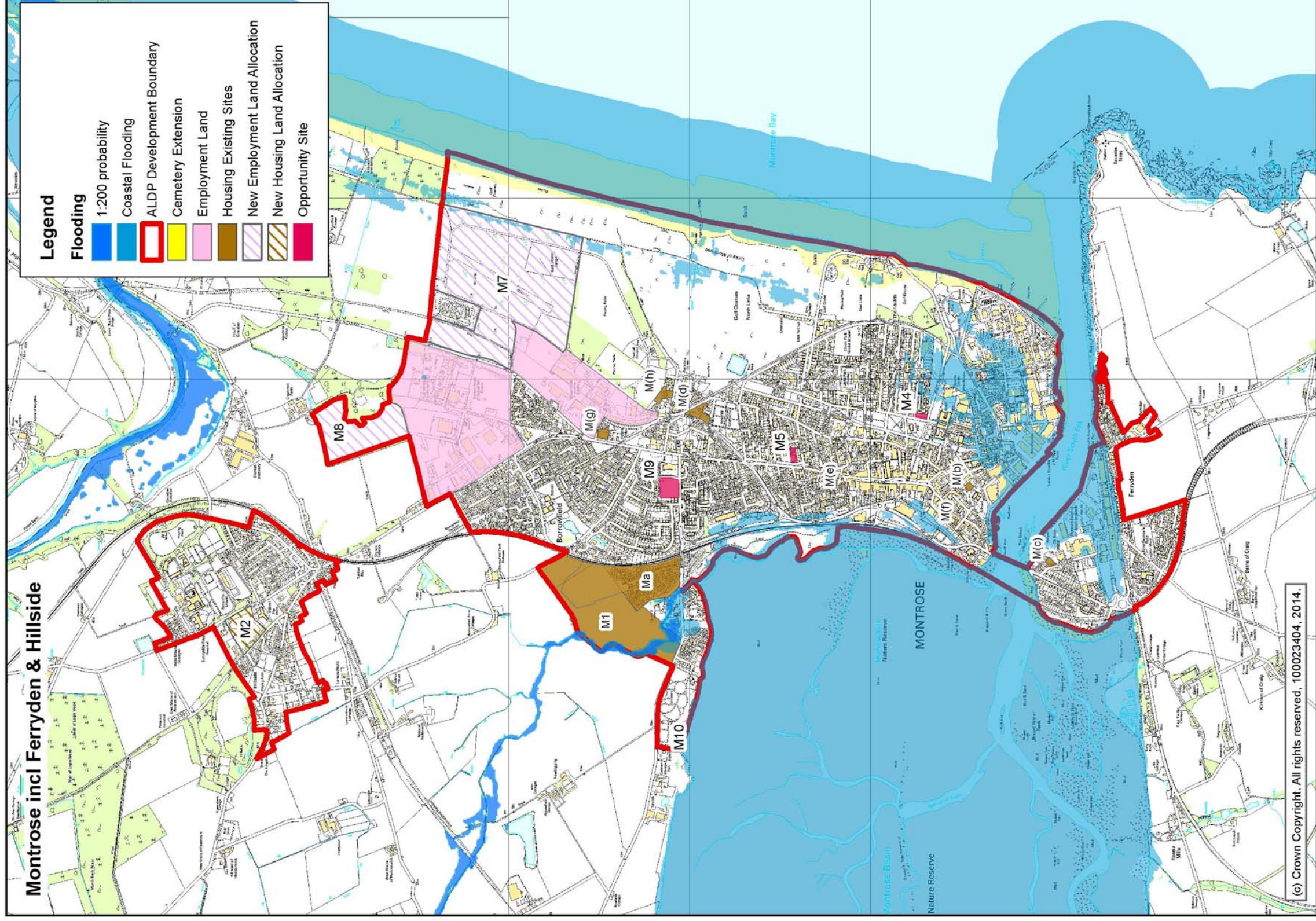
Sites Previously Identified by the Angus Local Plan Review

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
M1	Brechin Road	G/F	Hsg	yes	yes	yes	Historical records of flooding in the town. A review of the previous FRA to include new legislation and all sources of flooding may be required for further planning applications.	n/k			
M9	Lochside Distillery, Brechin Road	B/F	Opp	no	yes	no		n/k	no	no	Redevelopment sites – development management will consult with the FPA and apply ALDP policy.
	Sunnyside	B/F	Mixed	no	no	no	No apparent flood risk	n/k	no	no	
	Forties Road Industrial Estate	BF	Emp	no	no	no	No apparent flood risk	n/k	no	no	Existing Industrial Estate
	Broomfield Industrial Estate	BF	Emp	no	no	no	No apparent flood risk FPA should be consulted re coastal erosion and long term sustainability of the area				Existing Industrial Estate. Proposed extension addressed below.

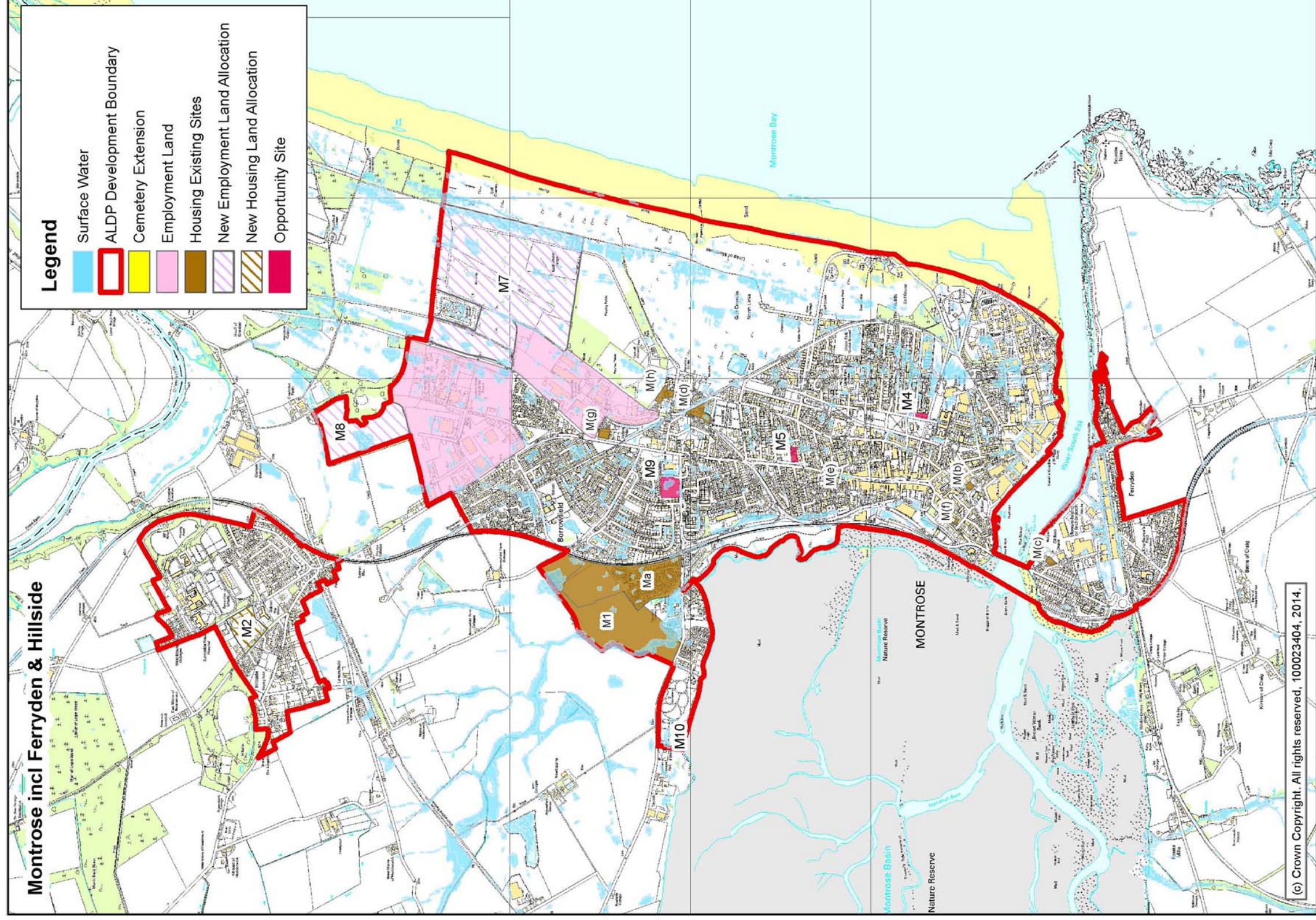
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
M2	Rosemount Road, Hillside	G/F	Hsg	no	no	no			no	no	
M3	Sunnyside	B/F	Mixed	no	no	no	No apparent flood risk	n/k	no	no	Redevelopment site – development management will consult with the FPA and apply ALDP policy.
M4	Chapel Works Mill, Marine Avenue	B/F	Opp	no	no	no		n/k	no	no	Redevelopment site – development management will consult with the FPA and apply ALDP policy.
M5	Former Swimming Pool, the Mall	B/F	Opp	no	yes	no	n/k	n/k	no	no	Redevelopment site – development management will consult with the FPA and apply ALDP policy.
M7	Montrose Airfield	G/F	Emp	no	no	yes		n/k	poss	poss	Redevelopment site – development management will consult with the FPA and apply ALDP policy.
M8	North of Forties Road	G/F	Emp	no	yes	no		n/k	no	no	Environmental statement to assess drainage and coastal flooding.
M10	Sleepyhillock Cemetery Extension	G/F	cem	no	yes	no					Preparatory works undertaken. Surface water will be addressed as part of site development and management process.

Map 20 ALDP sites / allocations in Montrose with Coastal and 1:200 fluvial flood data



Map 21 ALDP sites / allocations in Montrose with pluvial data

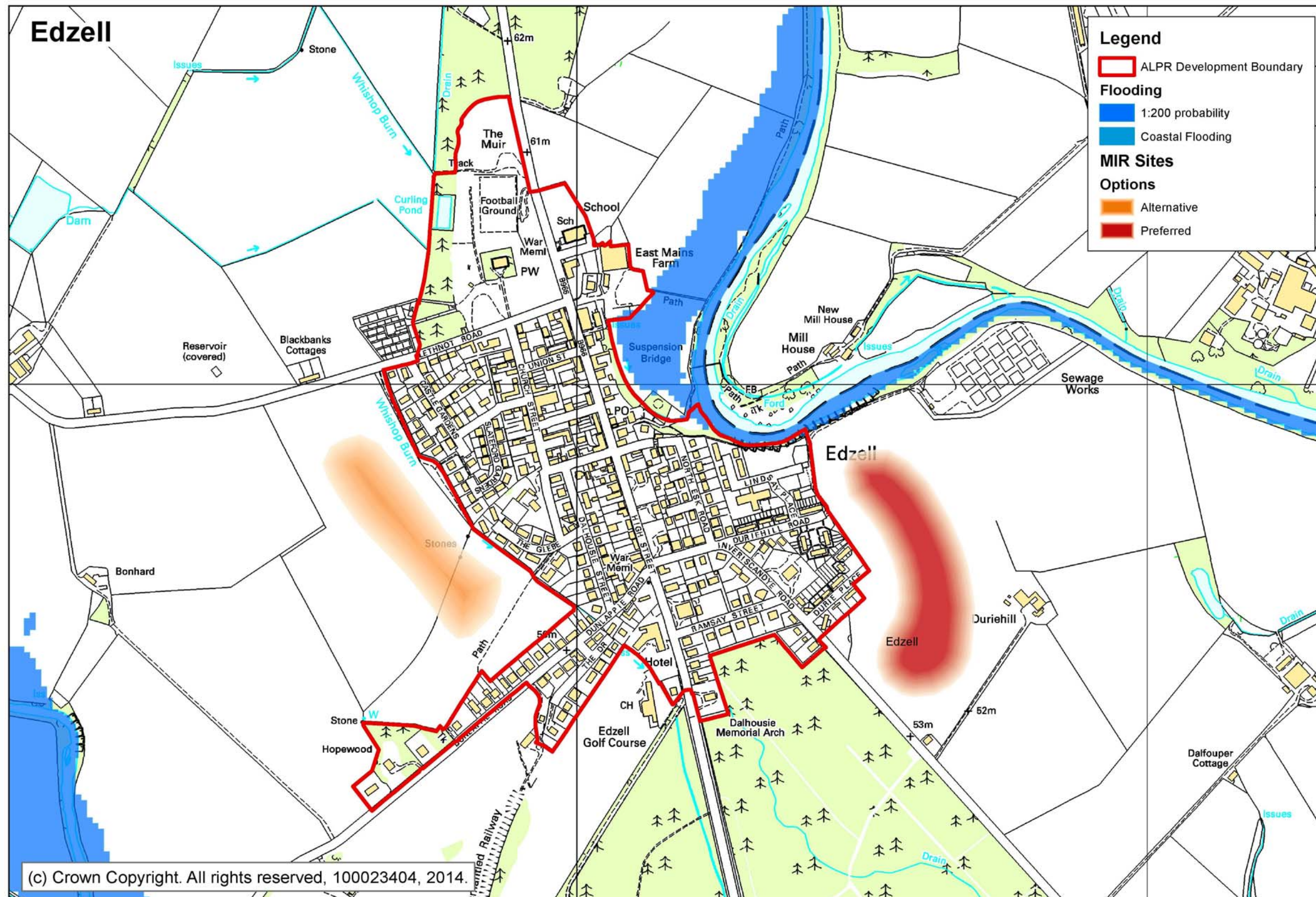


Edzell

TABLE 19 - MIR Options for Edzell

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred 2 sites – Former Mart and SE	Outwith areas of known high flood risk	no	Records of flooding from the Whishop Burn in 1985, 2009 and 2012 downstream of the site. Support part of the channel being opened up from a culvert but it needs to be demonstrated that there is no increased risk of flooding downstream. Do not support buildings being placed over any culverted watercourses. Housing - No known flood risk. Flood risk associated with the North Esk but a large area is likely to be available for development	Continued to ALDP
Alternative 1 2 sites – Former Mart and west		no	Records of flooding from the Whishop Burn in 1985, 2009 and 2012 downstream of the site. Support part of the channel being opened up from a culvert but it needs to be demonstrated that there is no increased risk of flooding downstream. Do not support buildings being placed over any culverted watercourses Housing – Historic information shows that part of this area is at risk of flooding. The flood risk associated with the watercourse, and any stretch that is culverted (up and downstream), would need to be considered and avoided. It may be that the constraints due to flood risk restrict the number of housing available on this site. An FRA must identify the risk of flooding, avoid those areas and show that flood risk is not increased elsewhere. There may be an opportunity to improve an existing problem of flooding.	Not continued to ALDP

Map 22 MIR options in Edzell with Coastal and 1:200 year fluvial flood data



**TABLE 20 – ALDP Identified and allocated sites in Edzell**  
**Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
E(a)	East Mains Farm	B/F	Hsg	yes	yes	n/a	There may be a risk of some flooding to the southern part of the site from the River North Esk. FRA required to determine the flood risk and therefore the limit of developable land in the southern part of the side.	n/k	yes	no	Under construction

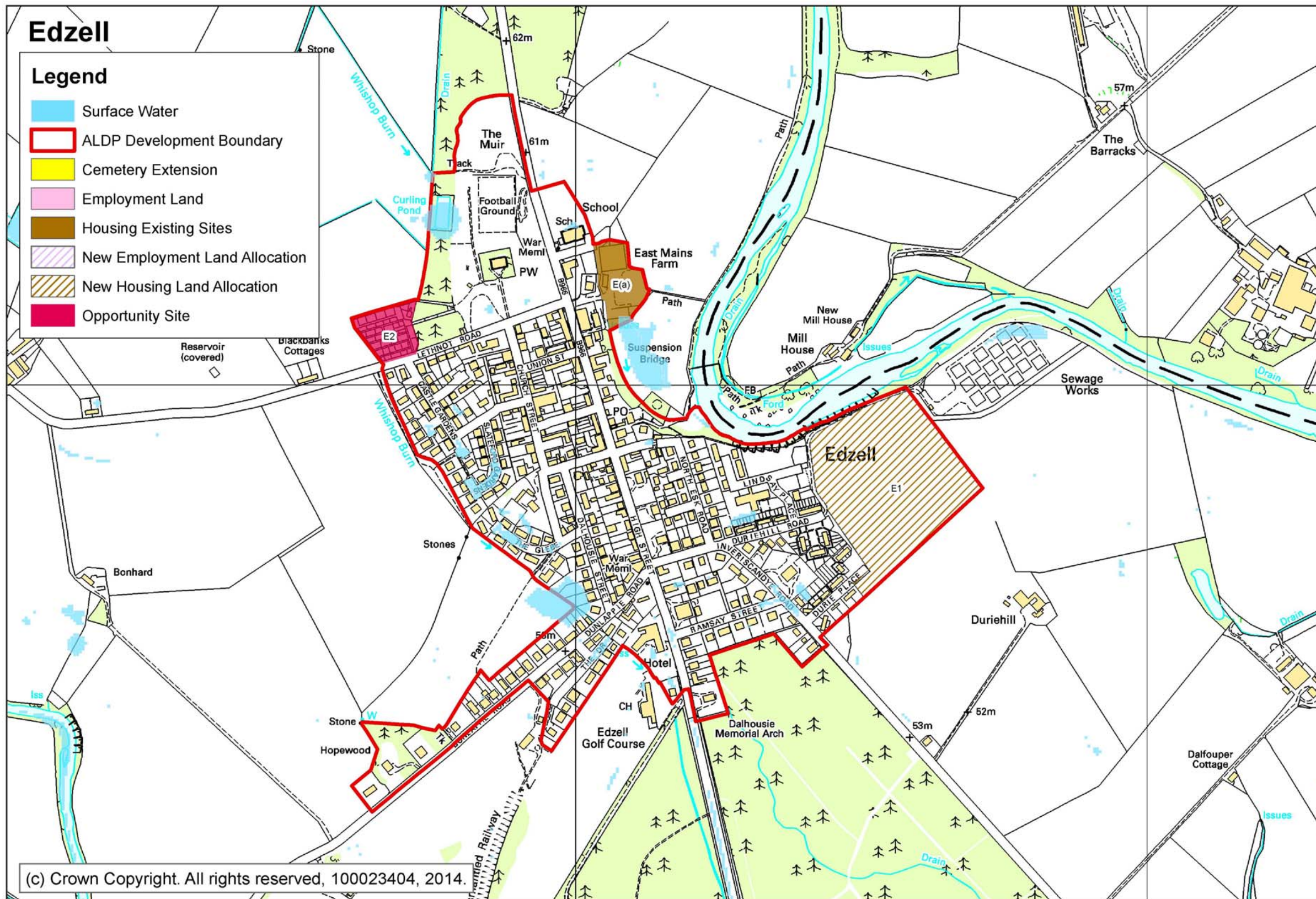
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
E1	East of Duriehill Road	G/F	Hsg	no	yes	n/a		n/k	no	poss	ALDP - Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan
E2	Former Mart, Lethot Road	B/F	Opp			n/a					





Map 24 ALDP sites / allocations in Edzell with pluvial data



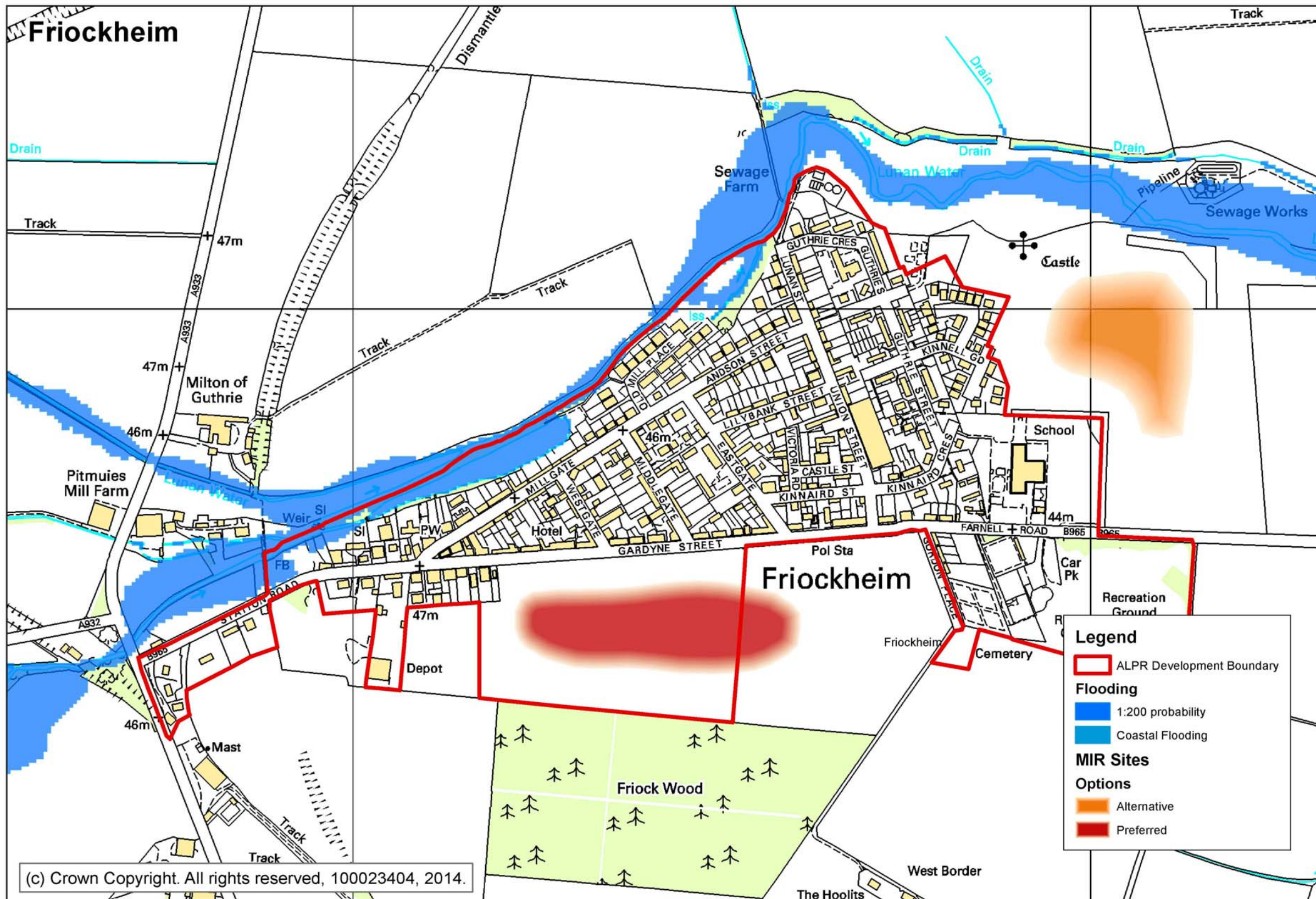
## Friockheim

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TABLE 21 - MIR Options for Friockheim

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred	Outwith areas of known high flood risk.	no	No known flood risk No flood risk apparent.	Continued to ALDP
Alternative 1	Abuts areas known to be at high risk of flooding	no	No known flood risk The flood risk associated with the Lunan Water would need to be considered but a large area is likely to be available for development.	Not continued to ALDP

Map 25 MIR Options in Friockheim with Coastal and 1:200 year fluvial flood data



**TABLE 22 – ALDP Identified and allocated sites in Friockheim**  
**Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
Fk1	South of Gardyne Street	G/F	Hsg	no	yes	n/a	No flood risk apparent Investigate source of small watercourse to the east of the site. A dry valley is within the site boundary where a small watercourse could emerge supported by groundwater, or be culverted. We would not support built development over a culverted watercourse	n/k	no	no	Requirement for Sustainable Drainage and surface water management plan.

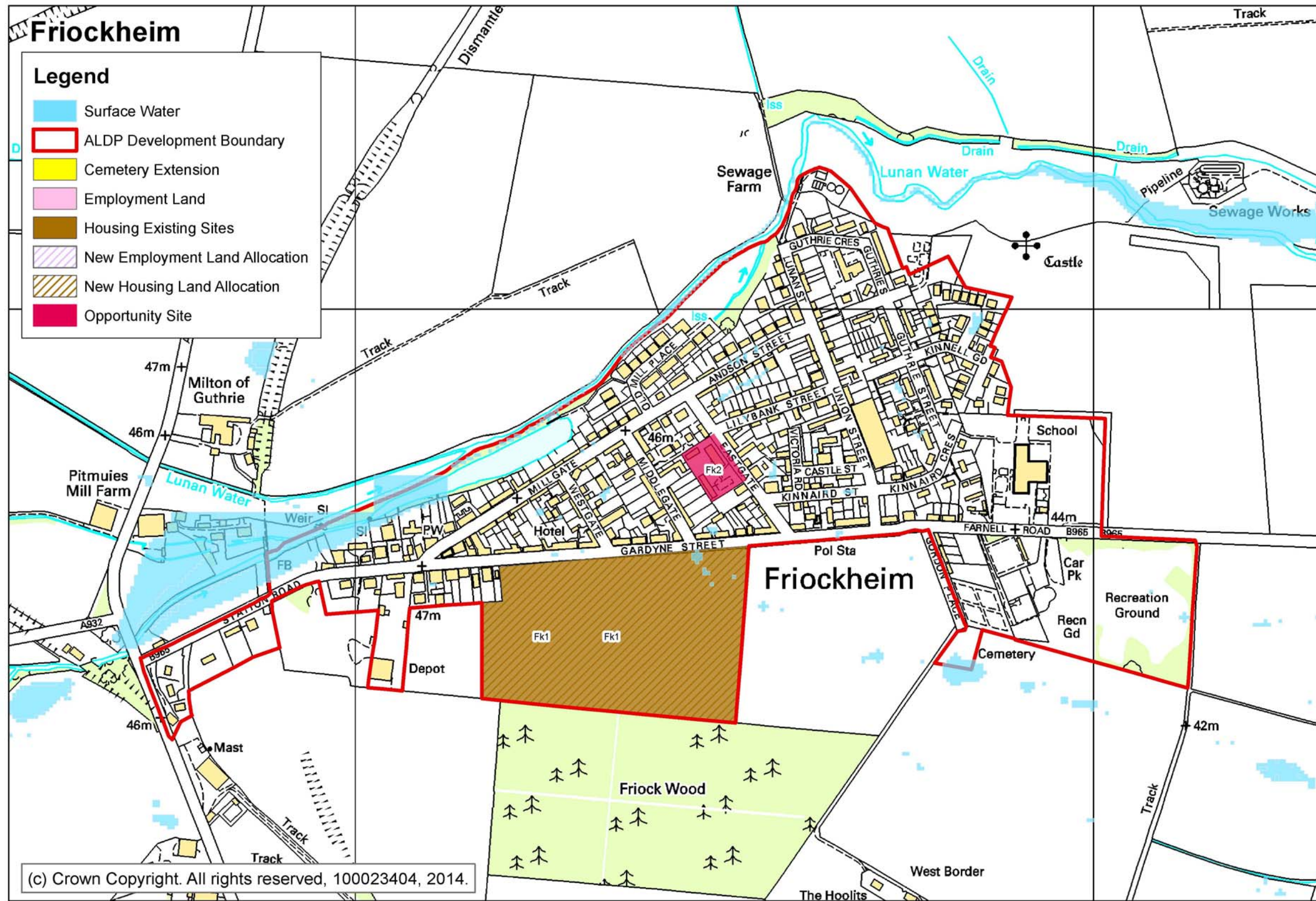
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
Fk2	Former Primary School, Eastgate	B/F	Opp	no	no	n/a			no	poss	Redevelopment/conversion site – development management will consult with the FPA and apply ALDP policy.

n/k



Map 27 ALDP sites / allocations in Friockheim with pluvial data



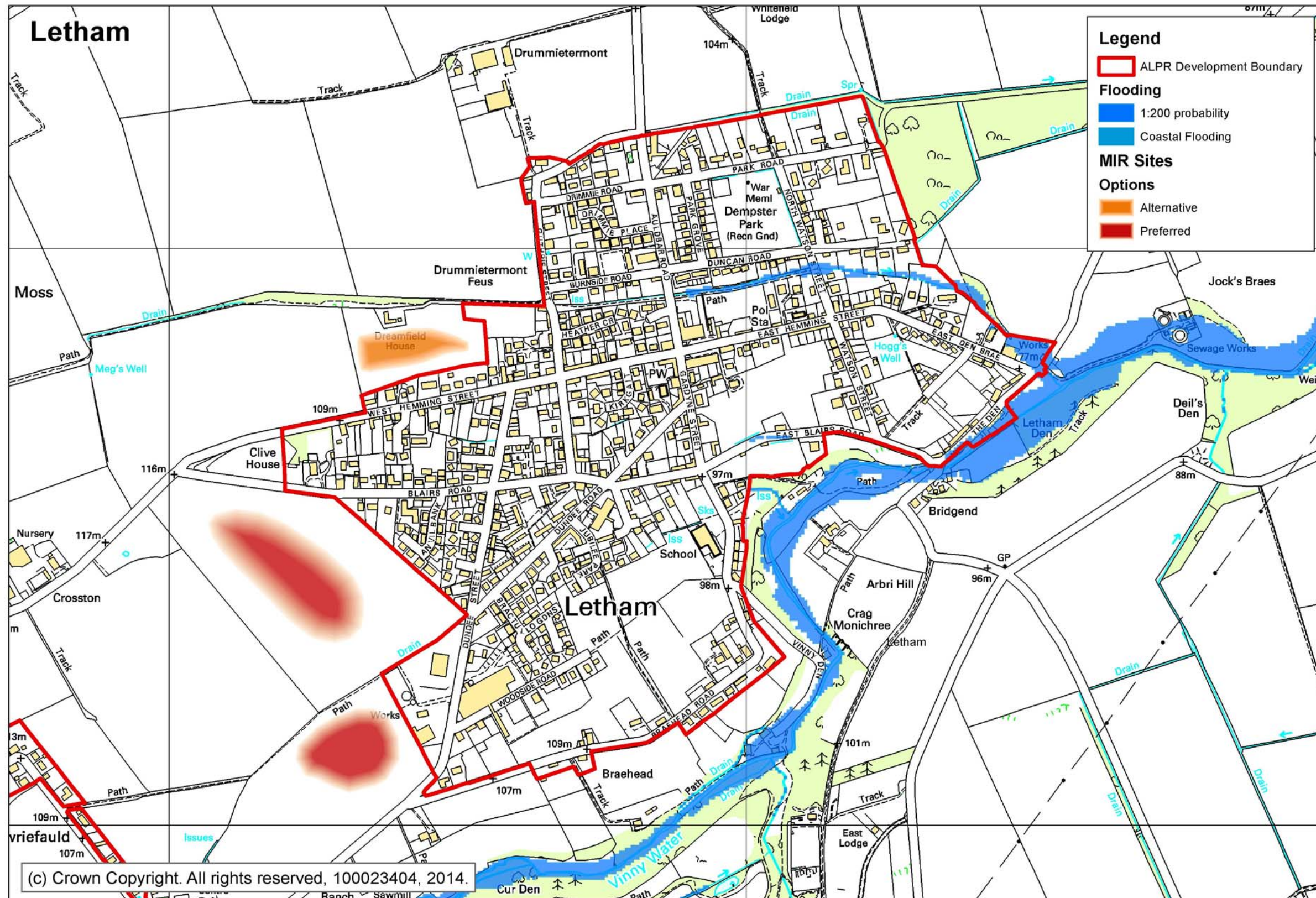
## Letham

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TABLE 23 - MIR Options for Letham

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred		no	No known flood risk Need to consider a small watercourse which appears to be culverted going through the area (between the housing and employment land site).	Continued to ALDP
Alternative 1		no	No known flood risk Need to consider a small watercourse which appears to be culverted going through the area to the north of the proposal.	Not continued to ALDP

Map 28 MIR Options with Coastal and 1:200 year fluvial flood data





**TABLE 24 – ALDP Identified and allocated sites in Letham**  
**Sites with planning permission or under construction**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
L(a)	16 Guthrie Street	G/F	Hsg	no	yes	n/a	Investigate the small watercourse and culvert on the boundary of the site and show that development would not increase the risk of flooding elsewhere.	n/k	yes	no	
L(b)	East Hemming Street	G/F	Hsg	yes	no	n/a	Investigate where the watercourse actually is (may be culverted beneath part of the site) determine the risk, avoid it and ensure there is no increased risk elsewhere.	n/k	yes	no	Under construction

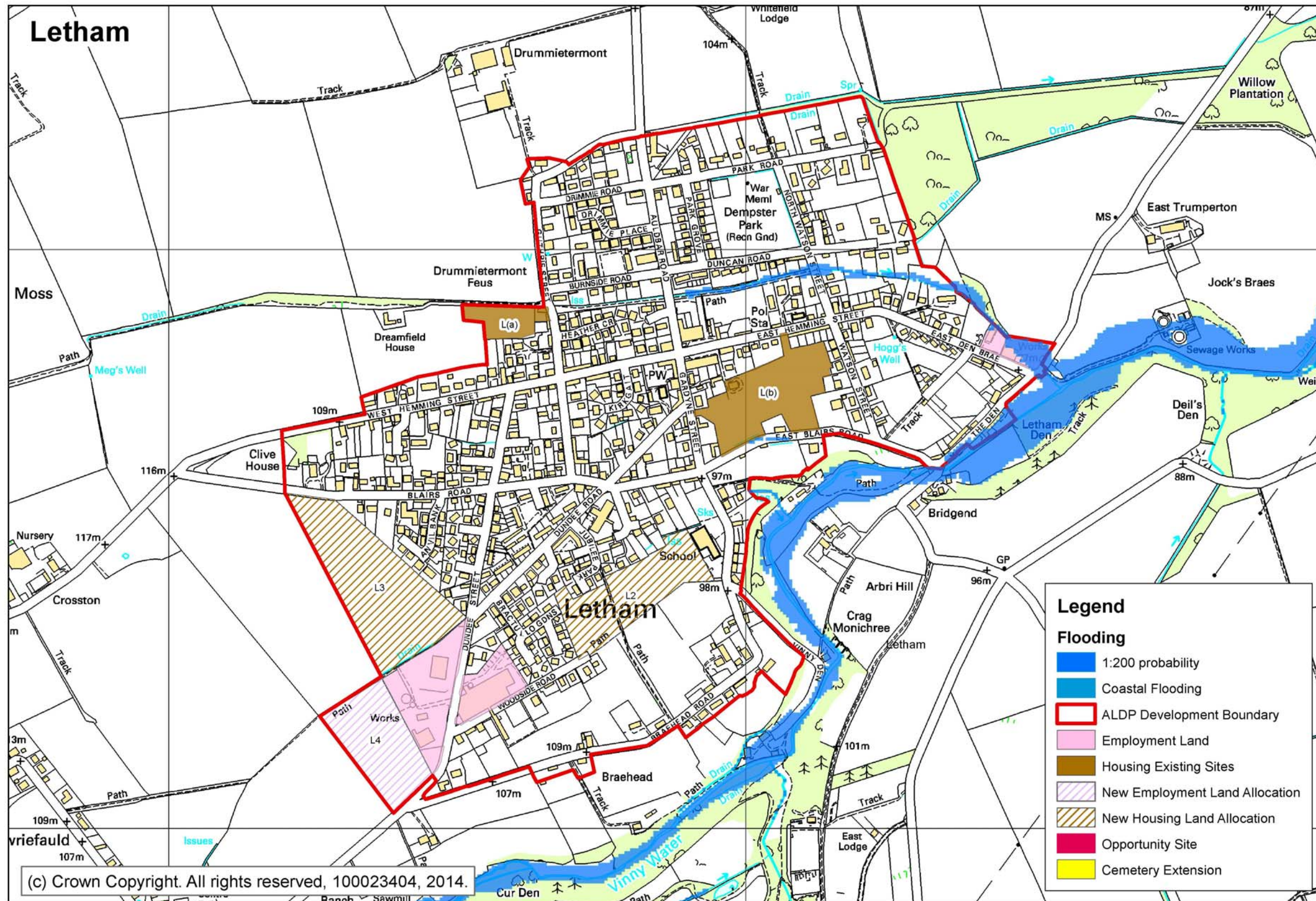
**Sites Previously Identified by the Angus Local Plan Review**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
L2	Jubilee Park	G/F	Hsg	no	no	n/a	Historic record of flooding from surface run off. Investigate the small watercourse and culvert on the boundary of the site and show that development would not increase the risk of flooding elsewhere.	n/k			ALDP - Foul drainage arrangements for the site should be agreed in writing with Scottish Water.

**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
L3	Land Between Blairs Road & Dundee Street	G/F	Hsg	no	yes	n/a					Relevant ALDP policies will apply
L4	Land at Dundee Street	G/F	Emp	no	no	n/a					Relevant ALDP policies will apply

Map 29 ALDP sites / allocations in Letham with Coastal and 1:200 year fluvial flood data



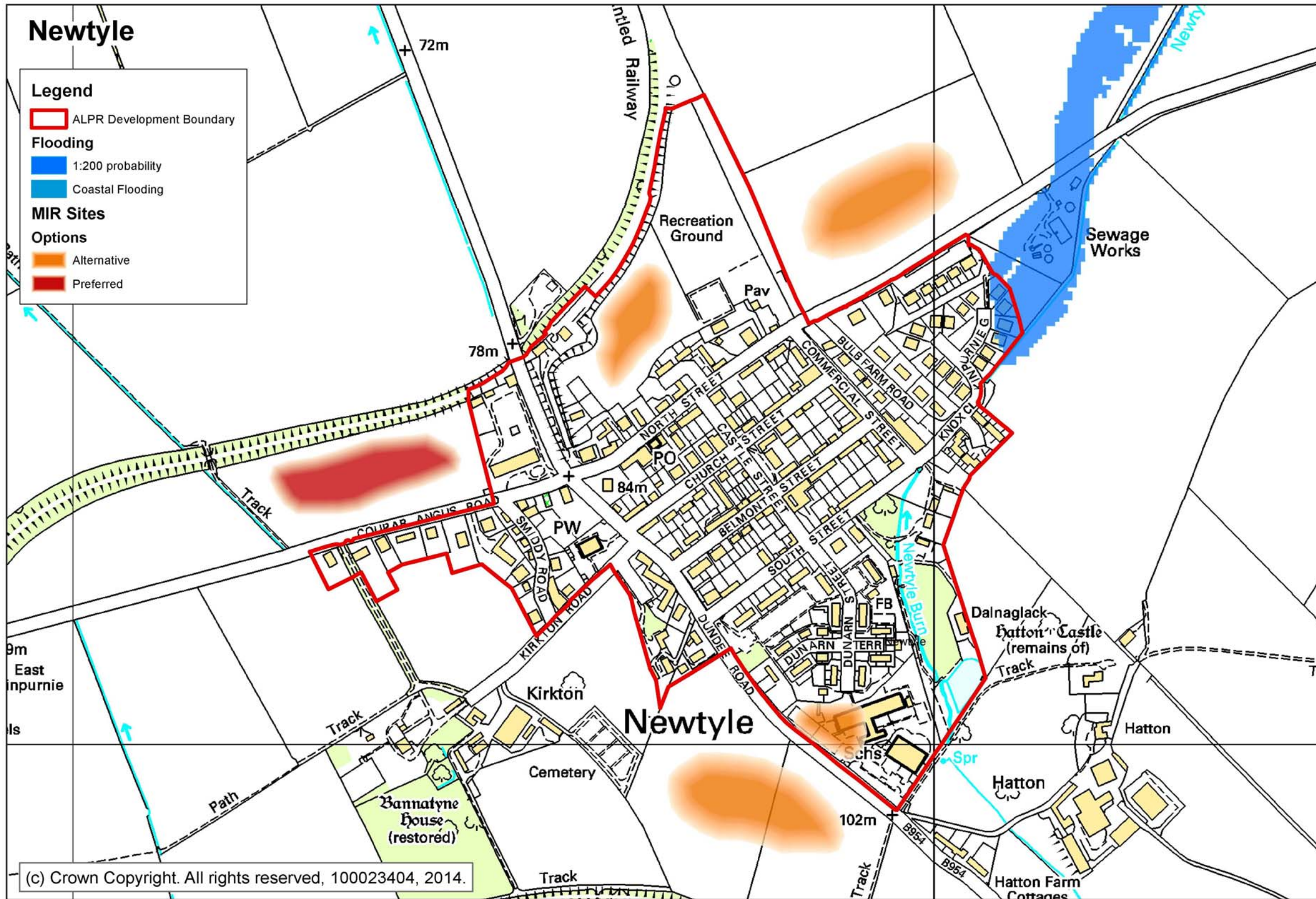


## Newtyle

TABLE 25 - MIR Options in Newtyle

Option	LA Comment	Fluvial 1:200	SEPA Comment	Action
Preferred 3 sites – North St, Coupar Angus Rd and School		no	No known flood risk  May be some risk associated with the small watercourse adjacent to the site by the school which could be investigated.	Coupar Angus Road only continued to ALDP
Alternative 1		no	No known flood risk  If the boundary extends towards the east it may encroach into the floodplain of the Newtyle Burn.	Continued to ALDP
Alternative 2		no	No known flood risk Surface water runoff from the hill behind could be considered if this site is taken forward.	Not continued to ALDP

Map 31 MIR Options in Newtyle with Coastal and 1:200 year fluvial flood data



**TABLE 26 – ALDP Identified and allocated sites in Newtyle**  
**New ALDP allocations**

Site ref	Site name	Greenfield or Brownfield	Land Use	Fluvial flooding	Surface flooding	Coastal flooding	SEPA Comments	Flood Defences	FRA required	Resilience measures required	Status / Local Authority Action
N1	Housing – Land north Coupar Angus Road	G/F	Hsg	no	no	n/a		n/k	no	poss	ALDP - Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan
N2	Housing – Land north of Eassie Road	G/F	Hsg	no	no	n/a		n/k	no	poss	ALDP - Drainage Impact Assessment, Sustainable Drainage and Surface Water Management Plan

Map 32 ALDP sites / allocations in Newtyle with Coastal and 1:200 year fluvial flood data

