

# Flood Prevention Report 2005

## 5th Biennial Report



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## **REPORT IN TERMS OF SECTION 3 OF THE FLOOD PREVENTION AND LAND DRAINAGE (SCOTLAND) ACT 1997**

### **1 BACKGROUND**

1.1 On 26 May 1997 the Flood Prevention and Land Drainage (Scotland) Act 1997 came into force. This placed a duty on local authorities to:

- assess watercourses in their area from time to time to determine whether their condition is likely to cause flooding;
- carry out maintenance works on watercourses which would significantly prevent or mitigate the likelihood of flooding; and
- to prepare and publish reports.

The 1997 Act limits Local Authorities responsibilities to the flooding of non-agricultural land. Where any flood prevention works would benefit only one person or organisation, then the Local Authority is not required to carry out such works.

1.2 The first report was published in December 1997 and it is a requirement of the act to publish further reports every two years setting out:

- all occurrences of such flooding since that date;
- the measures which have been taken since the date of publication of their previous report; and
- the measures that are required to prevent or mitigate the flooding of non-agricultural land in their area;

1.3 The purpose of publishing these reports is to ensure that local people and other interested parties have ready access to local authority records and information with regard to flooding in their area. This report is the fifth to be published.

1.4 The City Council seeks the participation of the citizens of Dundee in providing information on flooding within the City. This report sets out the current position as far as it is known and proposes appropriate future action.

Anyone who has additional information on known flooding risk areas which have not been identified in this report is invited to bring it to the attention of:

The City Engineer  
Planning and Transportation Department  
Crichton Street Dundee City Council  
Floor 14, Tayside House  
DUNDEE  
DD1 3RB

## **2 IDENTIFICATION OF WATERCOURSES**

2.1 A schedule of all watercourses within the Council's boundaries has been prepared and is set out in Appendix 1. The map in Figure 1 shows the location of all known watercourses and is based on information gathered from historical records. Many of the watercourses have been culverted or piped below ground level at some time in the past and have subsequently been either diverted for industrial purposes in earlier times or more recently moved to make way for development works. Accordingly, precise records have been difficult to obtain. Where there is doubt over the exact line of a watercourse, the anticipated line has been shown as a broken line on the plan.

2.2 The main watercourses which affect the city are:

- River Tay;
- Dighty Water and its tributaries, the Gelly, Whitfield, Fithie and Murroes Burns;
- The Logie Spout/Scourin' Burn;
- Lochee Burn,
- Dens Burn; and
- Fowlis

### **3 REVIEW OF FLOODING EVENTS SINCE DECEMBER 2003**

3.1 Since the previous report in 2003 there have been three significant events resulting in damage to property and disruption to resident and local businesses.

3.2 The first two events occurred on the 11 and 16 August 2004 and result in flooding to the City Centre and many smaller locations across the City. Additionally the green urban fringe of the City was affected by surface water run-off causing some roads to become impassable.

The rainfall event of the 11 August 2004 was reported as a 1 in 200 year event and the Leuchars weather station reported a 1 in 1000 year event in terms of the total rainfall experienced over the period.

The cause of the flooding took two forms, in the City Centre etc the flooding was primarily sewer flooding in that the volume and intensity of rainfall water exceeded the capacity of the sewers. In the urban fringe the cause was primarily surface water run-off from waterlogged ground. The rainfall event of the 16 August 2004 affected primarily the City Centre resulting in basement flooding and disruption to traffic flows. This event was estimated at a 1 in 100 year event.

3.3 The third significant event occurred in January 2005 and resulting from a combination of the annual Highest Astronomical Tide plus tidal surge of 0.7m due to hurricane force storm conditions. This resulted in the overtopping of the sea wall on Riverside Drive and subsequent closure of that road due to flooding.

It should be noted that tidal levels are predicted to be higher in future years and should meteorological effects combine then higher river water levels than those encountered in January 2005 are possible.

## **4 MEASURES TAKEN SINCE DECEMBER 2003**

### **4.1 Assessment of Watercourses**

The 1997 Act requires the Council to assess watercourses from time to time to establish whether or not their condition is likely to lead to flooding of non-agricultural land. Inspections have been carried out, concentrating particularly at known flood risk areas, during periods of heavy rainfall.

### **4.2 Flood Alleviation Operations**

Since the publication of the 2003 report no flood alleviation operations have been implemented.

### **4.3 Hydrological Studies**

The existing computer models of the Dighty and its tributations are maintained and reference is made where development impacts the watercourses.

### **4.4 Flood Emergency and Warning Planning**

In the event of a major emergency involving flooding, the City Council has in place an integrated emergency management procedure which has four main aims:

- To clarify the roles of the organisations involved in dealing with emergencies;
- To ensure that the City Council are able to provide the resources at its disposal in dealing with the emergency;
- To provide information on the support and assistance available from the City Council and all other agencies and organisations; and
- To ensure that appropriate arrangements are in place to co-ordinate the City Council's response to such an emergency.

As part of the overall emergency plan a detailed section on 'Response Measures to Flooding Emergencies' has been issued.

As part of this procedure, the City Council has access to information from various sources to assist in the warning of potential flooding occurrences. Information on severe weather conditions, atmospheric surge conditions in the Tay estuary and predicted tide levels is collated. In addition, contacts have been made with the Scottish Environment Protection Agency (SEPA) who can provide information on flow levels due to extreme events such as snow melt combined with heavy rainfall with the Tay catchment area.

The information obtained from these various sources is analysed and used to predict the likelihood of flooding in low lying areas adjoining the estuary such as the Broughty Ferry area at Fisher Street where a combination of adverse conditions occasionally results in local flooding events. Similarly, for the other watercourses, meteorological information is used to assess the risk of flood events occurring. In addition, SEPA has now introduced a telephone Floodline Service for the whole of Scotland. This provides public information on the possible risk of flooding 365 days a year 24 hours a day. Callers will receive details of any flood warnings in force in their area. This is also an option to speak to a duty officer if necessary. The service is based at SEPA's new communications centre in Perth. **The Floodline number is 0845 988 1188** and is also available on SEPA's web site.

#### 4.5 **Flood Appraisal Group**

A formal Flood Appraisal Group has been established and incorporates representatives from the City Council, the Scottish Environment Protection Agency, the North of Scotland Water Authority, Angus Council, Association of British Insurers and Railtrack. In addition the following organisations have an open invitation to attend and are circulated with minutes of meetings; Perth and Kinross Council, University of Dundee and University of Abertay.

This Group presently meets as required.

#### 4.6 **Development Control - SUD's Group**

All development within the City is controlled to ensure that it complies with the Guidance given in Scottish Planning Policy SPP7 and that where appropriate, Sustainable Urban Drainage Systems (SUD's) are incorporated. This is achieved largely through the work of the SUD's Group which meets on a fortnightly basis.

This Group comprises representatives from Dundee City Council together with representatives from SEPA and input from Scottish Water. The SUDS group meet with developers and their Agents to review proposed developments and to offer guidance on acceptable measures for dealing with surface water and to ensure that development does not encroach inappropriately into the flood plain.

Developers and their agents are actively encouraged to participate in pre-application discussions with this group to facilitate the development process.

## **5 FURTHER MEASURES TO BE TAKEN**

### **5.1 Maintenance Inspection and Remedial Works**

It is proposed to continue the regular inspections to monitor the condition of watercourses within the city boundaries. These inspections are carried out on a rolling programme and are prioritised with the areas of highest risk being targeted as requiring the greatest use of resources.

As a result of these inspections it may be necessary for the City Council to use its powers under the Flood Prevention (Scotland) Act 1961 to instruct maintenance works to be carried out. These powers would only be used where the maintenance works would substantially reduce the likelihood of flooding occurring and where the flooding is likely to affect more than one owner.

### **5.2 Identification of Capital Works**

Where the inspections show that there is a requirement for more substantial works, other than routine maintenance, then consideration will be given to promoting a flood prevention scheme. Should such a scheme be required and funded from Capital then the Council would have to exercise its powers under the 1961 Act to promote such works.

Currently it is considered that a Flood Prevention Scheme may be required for parts of the estuarial coast at Broughty Ferry. It is proposed to carry out an information gathering exercise leading to a feasibility study prior to carrying out an option appraisal.

Following the outcome of this preparatory work a decision will then be taken as to whether a formal flood prevention scheme should be promoted under the Flood Prevention (Scotland) Act 1961.

### **5.3 Continuing Liaison**

In order to help reduce the risk of flooding occurring in the future, it is vital that the City Council maintains and builds on its current links with other organisations and bodies. In order to achieve this, the City Council shall seek to develop closer links in this regard with the following organisations:

- Perth and Kinross Council;
- Angus Council;
- Scottish Environment Protection Agency;
- Scottish Water;
- Scottish Natural Heritage; and
- Scottish Executive, Air Climate and Engineering Division

### **5.4 Control of Future Development**

Existing planning legislation already provides for the possibility of new development and must assess the risk of any such development in areas identified as being prone to flooding. In addition Scottish Planning Policy No 7 "Planning and Flooding" contains further detailed guidance on the inter-relationships between planning and flood risk issues.

Future development within the City shall continue to be controlled through the work of the SUD's Group in line with Scottish Planning Policy No 7 and where appropriate, by reference to national guidance in the form of the design manual for Scotland & Northern Ireland; 'Sustainable Urban Drainage Systems' (S.U.D.S) this document is supported and promoted by amongst others, COSLA, SEPA, Scottish Water & Scottish Executive to deal with the disposal of surface water from development sites. To allow new development to proceed, a balance has to be achieved between improving surface water quality through the use of SUDS as recommended by SEPA and the requirement to reduce the risk of flooding. Such SUDS have the combined benefit of improving water quality and attenuating surface water discharges in order to minimise the risk of flooding downstream and upstream of the development.

## 5.5 **E-Documents**

It is proposed to utilise the Council's Graphical Information System (GIS) to manage the database of flood sensitive sites and their history. It is also intended to record significant rainfall events and have the information available for cross referencing against flood sensitive sites contained in the database.

The most recent flood report is available for public access on the Council's Website at <http://www.dundee.gov.uk/flood/floodreport2005.pdf>.

## BIBLIOGRAPHY

The Flood Prevention and Land Drainage (Scotland) Act 1997

The Flood Prevention (Scotland) Act 1961

Scottish Planning Policy No 7 - "Planning and Flooding"  
Scottish Executive - Development Department

A Guide to Surface Water Best Management Practices - SEPA 1996

'Sustainable Urban Drainage Systems' (Design Manual for Scotland & Northern Ireland)  
Sustainable Urban Drainage Scottish Working Party - 2000 CIRA Report 521

Planning Advice Note 61  
Planning & Sustainable Urban Drainage. July 2001

Planning Advice Note 69  
Planning and Building Standards Advice on Flooding

Liaison with Planning Authorities – SEPA.

COSLA Task Group on Flooding Report – March 2003.

Development Control Guidance Note on Flood Risk  
SCOTS Flooding Group – December 2003.

## Watercourses and Culverts      Appendix 1

Name	Length (m)	Watercourse Location
Dighty (open)	12192	Bridge at Baldovan to Estuary
Gelly Burn (open)	1219	Old Glamis Road to Claverhouse Road
Gelly (open)	1750	Dalmahoy Drive/Downfield Golf Course/Templeton Wood/Templeton Road
Gelly Burn	3048	Dalmahoy Drive/Macalpine Road/GilburnRoad/Old Glamis Road
Whitfield Burn (open)	2286	Berwick Drive to Fithie Burn
Whitfield	762	Berwick Drive
Fithie Burn (open)	1097	Rear of Pitkerro Mill to Dighty
Gorrie Burn (open)	1096	Pitempton Farm and west from Strathmartine Road parallel to Sidlaw Avenue
Gorrie	365	Bridge at Baldovan/Pitempton Farm and Strathmartine Road/Pitempton Farm
Invergowrie (open)	1676	Rear Swallow Hotel to Estuary
Murroes (open)	1036	Pitkerro House to Dighty
Lochee (open)	1341	Gourdie Industrial to Invergowrie Burn
Lochee	3047	Burnside Street/Gourdie Industrial Estate
Camperdown Park (open)	792	Through park
Camperdown	396	Liff Road/Kingsway
Clive Road (open)	152	Rear of houses at Clive Road at right angles to Gelly Burn
Back Burn (open)	243	Rear to sub-station at Macalpine Road parallel to Birkdale Place
Back Burn	2090	Macalpine Road/Strathmartine Road and Baldrigon Academy/Dighty
Mause Burn	396	Commerical Street/Dock Street
Dens Burn	2636	Glenogil Avenue/Arthurstone Terrace and St Roques/East Dock Street
Logie Spout	1036	Victoria Park/Edward Street
Scouring Burn	1179	Edward Street/Ward Road
Ward Road	481	Length of Ward Road
Perth Road	198	Perth Road/Foreshore
Perth Road	182	Foreshore at 590 Perth Road
Foster Road	243	Foster Road/Gelly Burn
Kingsway	610	Tesco/Clive Road
Craigiebank	631	Arbroath Road/Craigie Avenue to Strips of Craigie
Claypotts	1829	Ferndale Drive/Church Street
Barnhill	1432	Strathmore Street/Monifieth Road
Tay (open)		Invergowrie/Barnhill
Fowlis (open)	1900	Rear Swallow Hotel to Benvie

**Flood Risk Locations**

**Appendix 2**

<b>No.</b>	<b>Name</b>	<b>Flooding Location</b>	<b>Flood Risk Potential</b>	<b>Flood Risk Category</b>
1	Dighty (open)	Land between Harestane Road and Home Farm	Property damage and flooding or agricultural land	2
2		Dighty/Old Glamis Road junction	Flooding of local road	2
3		Land north of Trottick	Flooding of agricultural land	3
4		Land between Mill Ponds and Barns of Claverhouse Road	Recreational and property damage	1
5		Playing fields west of St Saviours school	Flooding of recreational ground only	1
6		Industrial land west of Forties Road	Property damage	2
7		Land between Pearce Avenue and Tom Johnstone Road	Flood plain	2
8		Land northwest of Lilac Cottage on A92 Arbroath Road	Flooding or agricultural land	3
9		Land west of Milton Park Monifieth	Property damage	2
10	Gelly Burn	Dalmahoy Drive/Turnberry Avenue junction	Property damage	2
11		South of Primary school Turnberry Avenue	Property damage	2
12		Turnberry Avenue/Macalpine Road junction	Road flooding	3
13		Camperdown Road west of Strathmartine Road junction	Property damage	2
14		Gillburn Road south of Gillburn Primary School	Road flooding	3
15	Whitfield Burn (open)	Northwest of Berwick Drive/Ballumbie Road junction	Flooding of recreational ground	2
16	Fithie Burn (open)	Fithie/Drumgeith Road junction	Property damage	1
17	Gorrie Burn (open)	Gorrie Burn/Strathmartine Road junction	Property damage	1

## Flood Risk Locations

## Appendix 2

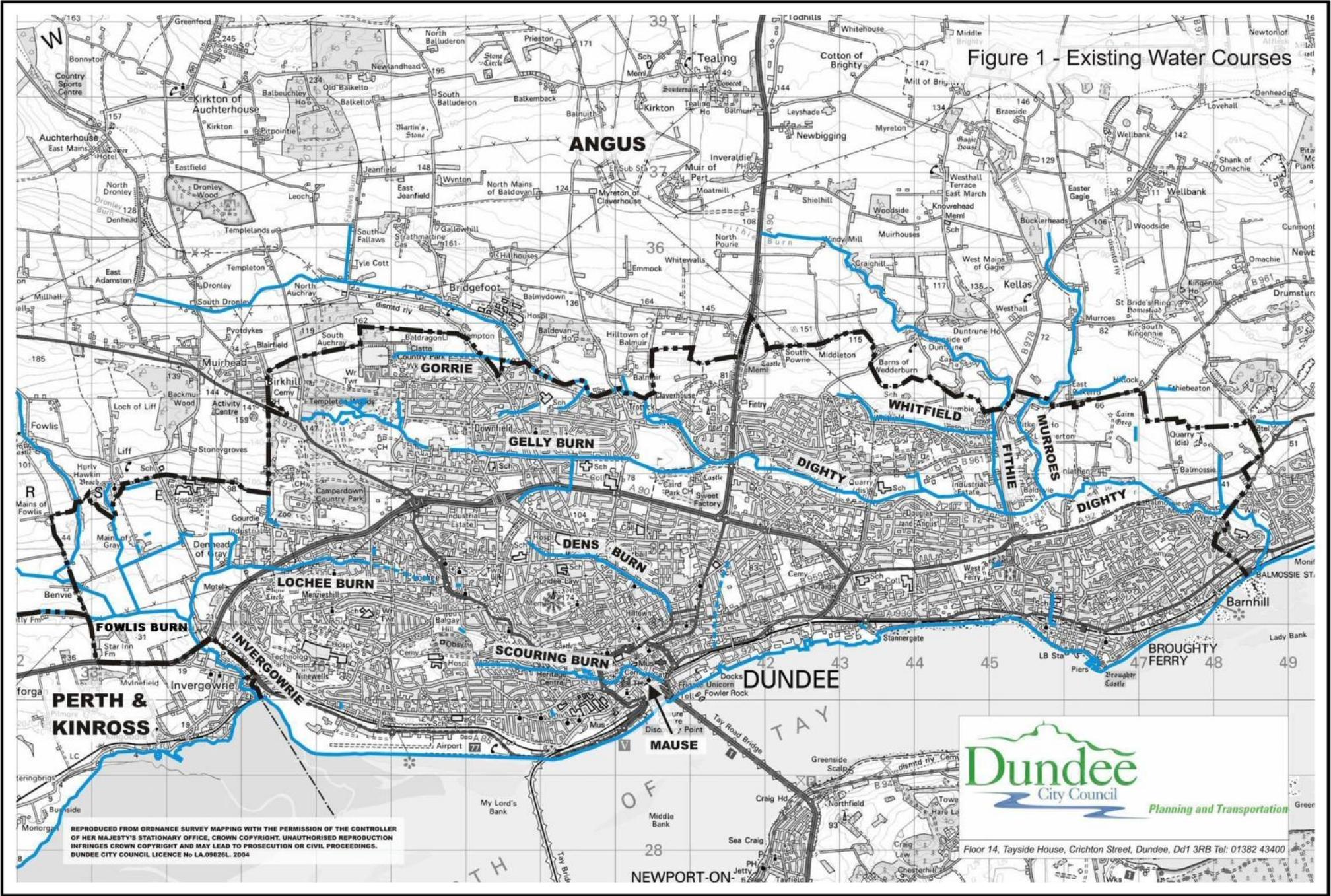
No.	Name	Flooding Location	Flood Risk Potential	Flood Risk Category
18	Gorrie	Farm land between Strathmartine Road and Pitempton Road	Flooding of agricultural land	3
19	Invergowrie (open)	Southwest of Swallow Hotel	Flooding of agricultural land	3
20		Pedestrian bridge and track	Pedestrian access problems	2
21	Murroes (open)	East end of Barlow Avenue	Flooding of agricultural land	3
22	Lochee	Bridge at Denhead of Gray	Flooding of agricultural land	3
23	Mause Burn & River Tay	Town centre shops	Flooding of roads possibly linked to tidal effects and storm water overflows	1 1
24	Logie Spout	Industrial Development	Property damage	2
25	Perth Road	Riverside Avenue west of Wright Avenue	Localised flooding of road	3
26	Tay (open)	Fisher Street, Broughty Ferry	Damage to property and flooding or road due to tidal effects	1
27		St Vincent Street, Broughty Ferry underpass below railway line	Flooding of road associated with tidal effects	1
28	Back Burn	St Leonards Road/Cox Street	Flooding on road	2
29		Gray Street/Long Lane/ Broughty Ferry	PropertyDamage	2 (0)
30	Fowlis/Lochee	Liff Road/Rear of Swallow Hotel	Flooding on Road	2(0)
31	Tay (open)	Riverside Drive at Tesco	Road Closure	1(0)

\*() - Figure in brackets refers to flood risk category from previous report.

### Flood Risk Category:-

- 1 - Serious damage to property, risk of personal injury, major disruption to services and transportation links.
- 2 - Nominal damage to property, disruption of services and transportation links.
- 3 - Minor inconvenience or little disruption to members of the public.

Figure 1 - Existing Water Courses



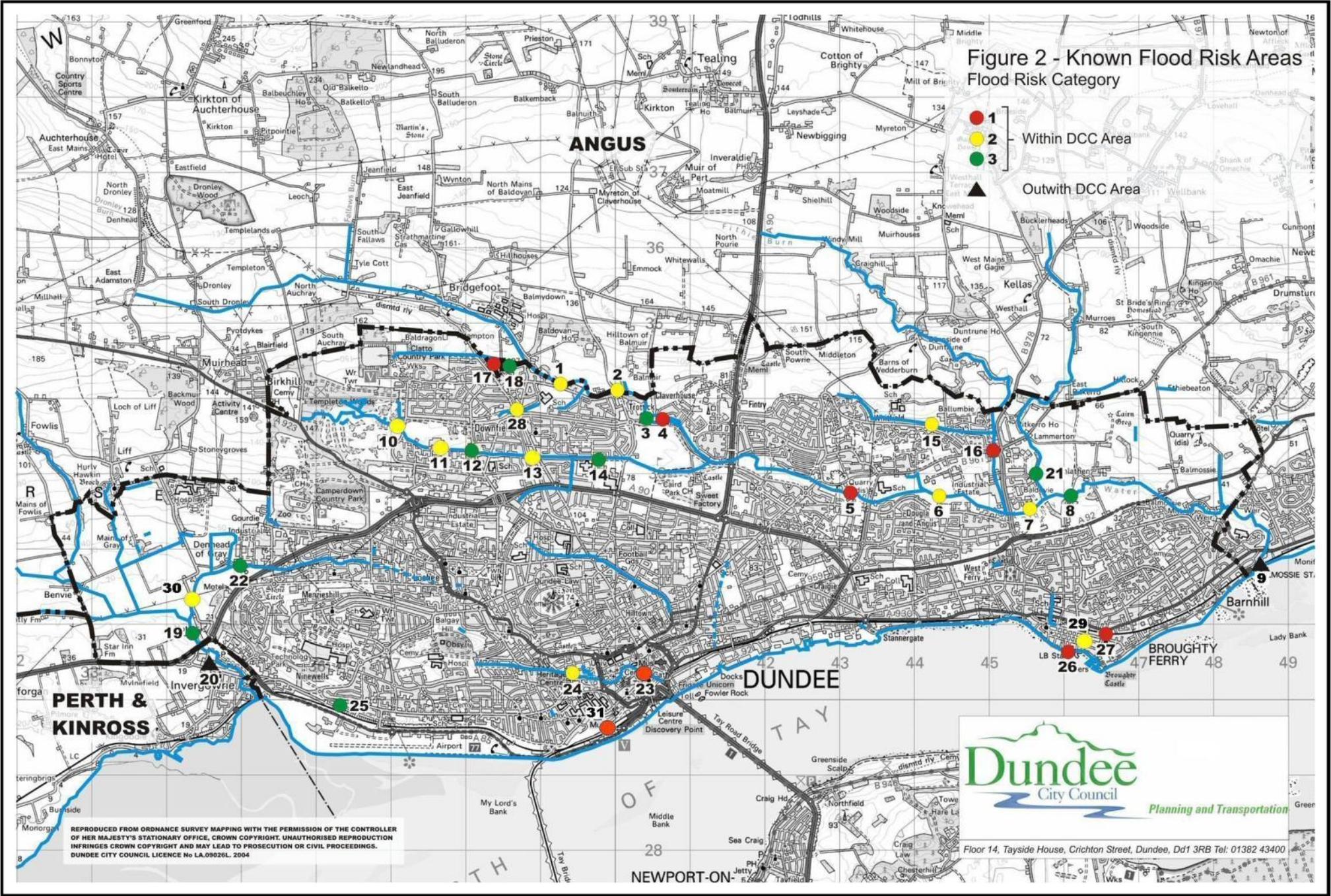
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Floor 14, Tayside House, Crichton Street, Dundee, Dd1 3RB Tel: 01382 43400

**Figure 2 - Known Flood Risk Areas**  
**Flood Risk Category**

- 1
  - 2
  - 3
  - ▲ Outwith DCC Area
- Within DCC Area

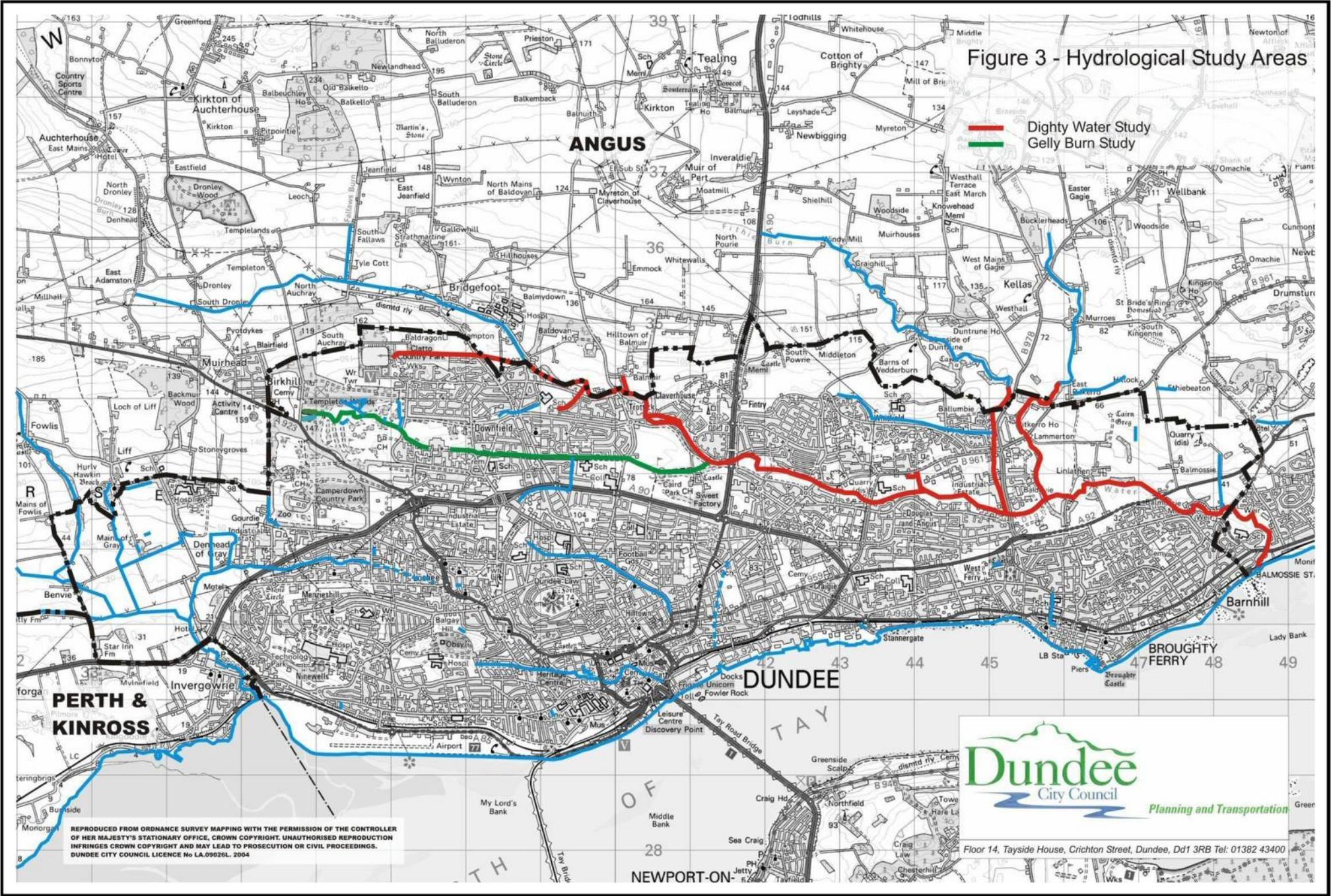


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Figure 3 - Hydrological Study Areas



— Dighty Water Study  
— Gelly Burn Study

  
 Dundee  
 City Council  
 Planning and Transportation

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