NORTH DEVON COUNCIL AND TORRIDGE DISTRICT COUNCIL – LEVEL 1 STRATEGIC FLOOD RISK ASSESSMENT

(PART 3 – TDC DATA)

DOCUMENT CONTROL SHEET

Client: **NORTH DEVON COUNCIL/TORRIDGE DISTRICT COUNCIL**

Project: **STRATEGIC FLOOD RISK ASSESSMENT (Part 3)**

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FOREWARD

This Strategic Flood Risk Assessment comprises of 3 Parts:

- **Part 1 – Strategy Document**
- **Part 2 – North Devon Council Data**
- **Part 3 – Torridge District Council Data**

Part 3 - Contents

1. GENERAL

1.1 Flood Zone 1

All uses of land are appropriate in this zone with consideration of the effect of surface water discharge on the other zones. Proposed development within Flood Zone 1 with an area greater than 1 hectare will require a Flood Risk Assessment (FRA) focused on the management of surface water run-off. Development that increases the amount of impermeable surfaces can result in an increase in surface water run-off, which in turn can result in increased flood risk both on site and elsewhere within the catchment. For sites less than 1 hectare in Flood Zone 1, a formal FRA will not usually be required. However if there are any known drainage problems or the development will affect watercourses or flood defences a FRA may be required.

1.2 Flood Zone 2 & 3

In accordance with PPS25 development in this area should be avoided due to the high risk of flooding. See Part 1, 4.2.
However, if development is proposed adjacent to or within Zones 2 & 3, the Planning Authority should apply the Sequential Test to demonstrate that there are no reasonably available sites with a lower probability of flooding appropriate to the type of development or land use proposed. **See Annex D of PPS 25.**

All of Flood Zone 3 shall be treated as Functional Floodplain unless stated otherwise.

If, following application of the Sequential Test it is not possible for the development to be located in zones of lower probability of flooding, the Exception Test should be applied. The Developer would be required to provide a Flood Risk Assessment. (see www.environment-agency.gov.uk for further guidance).

1.3 Upstream Catchments

Care must be taken in ensuring flows are not increased in the river catchments as in most cases increased flows will increase flooding downstream.

1.4 New Drainage Connections

All new proposed connections to foul or surface water systems must have the consent of the sewer owner. The owner should confirm if there is adequate capacity in the downstream system to prevent flooding. For new connections to the surface water system the developer should provide technical justification on why a SuDs system has not been utilised.

1.5 Existing Watercourses

Both the Environment Agency and the Council should be consulted regarding any proposed surface water discharge, alteration or piping of watercourses. The Council should be consulted if any proposed development is within 10 metres of a watercourse where flood plains have not been indicated on the Environment Agency flood maps. For new discharges to a watercourse the developer should provide technical justification on why a SuDs system has not been utilised. If the proposed discharge is greater than the geenfield run off rate then attenuation will be required.

1.6 Surface Water Management

Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management (SuDs). SuDs are an approach to managing surface water run-off which seeks to mimic natural drainage systems and retain water on or near the site as opposed to traditional drainage approaches which involve piping water off site as quickly as possible. SuDs involve a range of techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands. SuDs offer significant advantages over

conventional piped drainage systems in reducing flood risk by attenuating the rate and quantity of surface water run-off from a site, promoting groundwater recharge, and improving water quality and amenity.

Support for the SUDS approach to managing surface water run-off is set out in paragraph 22 of Planning Policy Statement 1 (PPS): Delivering Sustainable Development and in more detail in Planning Policy Statement 25: Development and Flood Risk at Annex F. Paragraph F8 of the Annex notes that "Local Planning Authorities should ensure that their policies and decisions on applications support and complement Building Regulations on sustainable rainwater drainage".

Approved Document Part H of the Building Regulations 2000 establishes a hierarchy for surface water disposal, which encourages a SuDs approach. Under Approved Document Part H the first option for surface water disposal should be the use of SuDs, which encourage infiltration e.g. soakaways or infiltration trenches. In all cases, it must be established that these options are feasible, can be adopted and properly maintained and would not lead to any other environmental problems. For example, using soakaways or other infiltration methods on contaminated land carries groundwater pollution risks and may not work in areas with a high water table. Where the intention is to dispose to soakaway, these should be shown to work through an appropriate assessment carried out under BRE Digest 365.

Flow balancing SuDs methods which involve the retention and controlled release of surface water from a site may be an option for some developments at a scale where uncontrolled surface water flows would otherwise exceed the local greenfield run off rate. Flow balancing should seek to achieve water quality and amenity benefits as well as managing flood risk.

Further information on SuDs can be found in annex F of PPS 25, the PPS25 Practice Guide, in the CIRIA C697 The SUDS Manual and the *Interim Code of Practice for Sustainable Drainage Systems*. The Interim Code of Practice provides advice on design, adoption and maintenance issues and a full overview of other technical guidance on SUDS. The Interim Code of Practice is available electronically on both the Environment Agency's web site at: www.environment-agency.gov.uk and CIRIA's web site at: www.ciria.org.uk

Where it is intended that disposal is made to public sewer, the Water Company or its agents should confirm that there is adequate spare capacity in the existing system taking future development requirements into account.

1.7 Climate Change

Tables B.1 and B.2 PPS 25 Annex B show recommended allowances for sea level rise and impacts on rainfall intensities, river flow, wave height and wind speed. The EA Flood Zone maps only include these allowances up to the date of the maps. Allowances still need to be added for the lifetime of the development when preparing flood risk assessments.

1.8 Public Sewers (South West Water)

Information regarding public sewers has been obtained from previous Local Plans and from local knowledge. South West Water has refused access to the DG5 (properties susceptible to internal flooding) register and has not commented on drafts supplied to them.

NB Capacity details have been provided by SWW for all its STWs.

1.9 Highway Drainage

Devon County Council were consulted but were unable to provide any information.

Note:

For further advice visit the Environment Agency Standing Advice for England (www.environment-agency.gov.uk).

Flood defence data has been obtained from the Environment Agency National Flood and Coastal Defence Database.

All levels relate to Ordnance Datum at Newlyn. (mAOD)

2. REVIEW OF THE MAIN CATCHMENTS

2.1 APPLEDORE

Area Description
Appledore is situated at the north end of the ridge and promontory upon which Northam stands, at the meeting point of the Taw and Torridge Estuaries, approximately 3km (2 miles) from the A39. The town has a rich maritime history centred around boat building.

Main Rivers
River Taw and River Torridge

Ordinary Watercourses
The Pill (Skern) and the Knapp Stream.

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Appledore. Sea defences protect the shoreline along the Quay. There is risk of tidal inundation during storm surges at West Appledore. The indicative Flood Zones 2 & 3 are shown on Figure 1.

Historical Flooding
The town centre of Appledore has suffered a long history of tidal flooding and is now protected by sea defences detailed below.

Existing Flood Risk and Defences
New concrete sea defences with a design standard of 1 in 200 were constructed in 1997 from New Quay Street on the southern side of Appledore to the Churchfields car park on the northern side. West of the car park, in West Appledore past Irsha Street to Watertown there are various masonry and concrete walls to a variety of protection levels. From New Quay Street south to the shipyard are also various masonry, steel and concrete walls generally to a protection level of 1 in 5 years. South of the shipyard the coastline has revetments and returns to a natural state after Windmill Lane. Details of the Appledore sea defences can be obtained from the Environment Agency (E.A.)
The E.A. flood plain maps show the properties at risk if the defences are overtopped.

Surface Water Sewers (SWW)
Surface water drainage is limited and flows gravitate to the River Torridge. TDC is not aware of any flooding on the sewerage system.

Foul Water Sewers (SWW)
Foul drainage from Appledore flows by gravity to Appledore pumping station where flows are transferred to the Northam system. The pumping station is in Flood Zone 2.

Highway Drainage (DCC)
No details

Comments
Any significant new development should to be in Zone 1 unless there is a need for coast related development, see Table D2 PPS25 – Water Compatible Development.
Proposed coast related development and development adjacent to the coast should be considered on its own merits. A Flood Risk Assessment should be produced to consider the effect of tide and river levels.

There are limited surface water sewers and disposal may be difficult depending on the location of any proposed development. The Environment Agency should be consulted regarding any proposed discharges to watercourses.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems to ensure there is capacity available. Developers will be required to fund any necessary improvements.

See Section 1 for further general comments.

2.2 BEAFORD

Area Description
Beaford is a medium sized compact village, approximately 8km (5 miles) south east of Great Torrington, astride the A3124

Main Rivers
River Torridge

Ordinary Watercourses
Beaford Brook

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Beaford. The indicative Flood Zones 2 & 3 are shown on Figure 2.

Historical Flooding
None in the village. In 1965 Beaford Mill close to the River Torridge reported river overtopping that surcharged drains and sewers.

Existing Flood Risk and Defences
None

Surface Water Sewers (SWW)
Most of Beaford is served by public surface water drainage. TDC is not aware of any flooding on the sewerage system.

Foul Water Sewers (SWW)
Beaford foul drainage discharges to the treatment works located north of the village. The STW is in Flood Zone 1.

Highway Drainage (DCC)
No details

Comments
There are no known drainage problems in the area.

Any proposed future development should be in Flood Zone 1.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. Developers will be required to fund any necessary improvements. Discharges to surface water sewers should be limited to green field run off rates.

See Section 1 for further general comments.

2.3 BIDEFORD

Area Description

Bideford town lies on the River Torridge estuary in the northernmost part of the district, at the principal river crossing points. The A39 Atlantic Highway /A361 North Devon Link Road connects the district to the M5 and to North Cornwall. The A386 /A388 route, which crosses the Torridge via the old Bideford Long Bridge, provides north-south links to Plymouth and Exeter. The River Torridge divides the town into two parts with the quay and the main commercial area situated on the west bank. The smaller part of the town situated on the east bank of the river is known as East-The-Water.

Main Rivers

River Torridge. The River Kenwith to Godborough Castle and the Northam Stream to Orchard Hill.

Ordinary Watercourses

Jennets Reservoir Stream, River Kenwith, Northam Stream, Westcombe Stream and Pill Stream (East the Water).

Flood Storage Areas and Flood Zones

The designated flood storage areas are at the River Kenwith flood storage, the Southcott/Pillhead Marshes and at Jennett's. The indicative Flood Zones 2 & 3 are shown on Figures 3a (Bideford West) and 3b (Bideford East). Tidal defences protect the waterfront of the River Torridge.

Historical Flooding

Prior to construction of the new quay wall in 2005, Bideford had been subjected to tidal flooding at regular intervals for many years. One of the most severe events occurred in 1984 when a combination of a high spring tide, southerly wind and a flood flow in the River Torridge caused flooding on both sides of the river. On the west bank 63 commercial properties were flooded in the area of the Quay, King Street, Cooper Street, Queen Street, Bridgeland Street, Ropewalk and Pill Road, together with four residential properties on the Strand. Flooding of industrial premises in the New Road area also took place. At East-The-Water ten commercial properties were affected together with 28 residential properties mainly on Torrington Street.

Flooding of The Quay took place on average 2 or 3 times a year generally without affecting property.

Flooding has occurred frequently in the Kenwith Valley and there were 10 recorded occasions between 1931 and 1963. Further significant events have occurred in the last 45 years, in 1979, 250 houses and other properties were flooded to a depth of 1.5 metres. In 1993, approximately 50 properties in the Alexandra Terrace area were flooded to a depth of 0.3 metres. Various flood alleviation schemes have been constructed over the years. They presently consist of an upstream storage reservoir, and a secondary open area below the dam (Petherick's Marsh). A pump station at the outfall point on the River Torridge allows discharge at any state of tide. In addition, there are floodwater transfer schemes in operation for the Westcombe and Northam Streams.

Existing Flood Risk and Defences

Bideford West

Kenwith Stream (fluvial flood storage dam and reservoir) protection 1 in 100. The scheme was originally built in 1984 and following the 1993 flooding the dam embankment was raised by 0.33 metres. Tidelock pumping and flood alert systems also were enhanced and improved. The Control House is in FZ3 and the Tidal Pumping Station is in FZ3. The main flow from the Westcombe Stream is transferred to the reservoir and the main flow from the Northam Stream is transferred to the control house. The Control House houses penstocks

that regulate the flows from the reservoir downstream to a tidelock pumping station and discharge to the River Torridge.
The tidal/fluvial defences from the new bridge to Victoria Park consist of a mixture of Sheet Piling walls, revetments and embankments, with a flood protection of 1 in 200.
From Victoria Park to the Long Bridge the tidal/fluvial defence consists of the new quay wall constructed in 2005, with a flood protection of 1 in 200.
Details of all these defences can be obtained from the Environment Agency (E.A.)
From the Long Bridge to Ford Rock the defences consist of masonry revetments and walls, concrete walls and sheet piles generally with a flood protection of 1 in 100, however there are some low spots that do not offer this protection.

Bideford East
To the north of Ethelwynne Brown Close is Southcott Marsh. The Tarka Trail (old railway embankment) segregates the flood plains from the River Torridge. This has a flood protection of 1 in 200.
Ethelwynne Brown Close has a flood wall with a flood protection of 1 in 100.
From Ethelwynne Brown Close to the Long Bridge the flood defences consist of masonry walls. These have a flood protection of 1 in 50.
From the Long Bridge upstream to the slipway at the end of Torrington Street the flood defences consist of masonry walls. These have a flood protection of 1 in 20.

Surface Water Sewers (SWW)
There are surface water sewers in the town but a large proportion of the drainage is combined. TDC is not aware of any flooding on the surface water system.

Foul Water Sewers (SWW)
All flows from East the Water are transferred to Bideford via the pumping station at Torrington Street. Sewage flows from Bideford are then transferred to Cornborough Sewage Treatment Works via Bideford pumping station and storage area (beneath Bank End Car Park) close to Riverbank House. The pumping station is in FZ3. There also are several smaller pumping stations transferring flows around the catchments. Former biobead arrangements developed during the sewage embargo now are linked to Cornborough.

Highway Drainage (DCC)
No details

Comments

Bideford West
The ground levels in Bideford West generally rise within a short distance of the river and a large proportion of the town is located within flood zone 1.
However, to the northern end of the town there is a large flood plain at the bottom of the Kenwith Valley. Any proposed development in this area should be subjected to the Sequential Test. Should the Exception Test need to be applied, in the absence of a Stage 2 SFRA, the developer will be asked to provide an extensive Flood Risk Assessment.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems.

See Section 1 for further general comments.

Bideford East
Again, ground levels in Bideford East generally rise within a short distance of the river and a large proportion of the property is located within flood zone 1. Any proposed development in this area should be subjected to the Sequential Test. Should the Exception Test need to be applied, in the absence of a Stage 2 SFRA, the developer will be asked to provide an extensive Flood Risk Assessment.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems.

See Section 1 for further general comments.

2.4 BRADWORTHY

Area Description
Bradworthy is one of the largest villages in the District. Close to the District's western boundary, it is located some 11.2 km (7 miles) to the north west of Holsworthy.

Main Rivers
None.

Ordinary Watercourses
River Waldon to the west, and a tributary of the River Waldon to the east.

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Bradworthy. The indicative Flood Zones 2 & 3 are shown on Figure 4.

Historical Flooding
Flooding did occur in 1996 from the River Waldon but no details are available.

Existing Flood Risk and Defences
None

Surface Water Sewers (SWW)
There is surface drainage in Bradworthy that serves Elizabeth Lea Close to the north and most of the development to the south of the village centre. These drains discharge to the watercourse to the east of the village. TDC is not aware of any flooding on the sewerage system.

Foul Water Sewers (SWW)
Bradworthy is deficient in respect of available sewerage infrastructure and sewage treatment capacity. South West Water has recommended an embargo on development, on all sites not already subject to planning permission. The sewage treatment works is operating at its design capacity and a sewage treatment scheme is under review.

Highway Drainage (DCC)
No details

Comments
There are no known drainage problems in the area.

Any proposed future development is likely to be in Flood Zone 1.

Discharging to a surface water sewer or watercourse may be difficult depending on the location of any proposed development. Soakaways and SuDS should be considered. Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.

The Environment Agency should be consulted regarding any proposed discharges to watercourses.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. It is likely that Developers will be required to contribute towards the cost of any required improvements. Discharges to surface water sewers should be limited to green field run off rates.

See Section 1 for further general comments.

2.5 BUCKLAND BREWER

Area Description
Buckland Brewer is a compact and sizeable hill top village located approximately 10 km (6 miles) south of Bideford. It has experienced steady growth since the mid 1980s. The parish population increased from 510 in 1981 to 764 in 1999. Additional housing development to the north, east and west of the village, principally on the eastern edge at Southwood Meadow and at Orleigh Close has contributed in excess of 40 new houses, increasing the size and altering the character of the village

Main Rivers
None

Ordinary Watercourses
There are no significant ordinary watercourses.

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Buckland Brewer. The indicative Flood Zones 2 & 3 are shown on Figure 5.

Historical Flooding
None

Existing Flood Risk and Defences
None

Surface Water Sewers (SWW)
Southwood Meadows, Orleigh Close and Castle Meadow have surface water sewers that discharge to local watercourses.

Foul Water Sewers (SWW)
Foul drainage flows to the sewage treatment works to the south of the village.

Highway Drainage (DCC)
No details

Comments
There are no known drainage problems in the area.

Any proposed future development is likely to be in Flood Zone 1.

Discharging to a surface water sewer or watercourse may be difficult depending on the location of any proposed development. Soakaways and SuDS should be considered. Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.

The Environment Agency should be consulted regarding any proposed discharges to watercourses.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. It is likely that Developers will be required to contribute towards the cost of any required improvements. Discharges to surface water sewers should be limited to green field run off rates.

See Section 1 for further general comments.

2.6 GREAT TORRINGTON (with Taddiport)

Area Description
Great Torrington is an old market town that developed on the trading route between Barnstaple and Plymouth. It occupies an elevated site east of the river Torridge some 11 km (7 miles) south of Bideford. It is an elongated settlement stretched along the A386, B3227, and B3232.

Main Rivers
River Torridge

Ordinary Watercourses
Week Bottom Stream, Common Lake Stream and Langtree Lake Stream

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Great Torrington. The indicative Flood Zones 2 & 3 are shown on Figure 6.

Historical Flooding
The most significant flooding in Gt. Torrington has been in the Taddiport area from the River Torridge. There have been numerous events recorded from 1952 to the present day. Flooded properties include Buckingham House and two adjacent properties on the south bank, the Toll House, Stanlea House, the old Dairy and sewage treatment works on the north bank.

Existing Flood Risk and Defences
Existing flood risk is high in the Taddiport area where there are no flood defences. There is a weir below the old bridge.

Surface Water Sewers (SWW)
There are surface water systems in Great Torrington, generally located in the newer developments located to the east. The sewerage systems discharge in various directions. There is some flooding during storm flows. An authorised sewerage discharge east of the cemetery causes waterlogging. Water pressure in the sewerage system may cause manholes to 'pop' (ie overflow) south and west of the town. Recent surface water separation schemes have ameliorated the problem.

Foul Water Sewers (SWW)
There are localised deficiencies in sewerage capacity throughout the town during high flow periods. South West Water has highlighted in a previous local plan a particular problem in the capacity of the sewer from Castle Hill Gardens to the treatment plant. Improvements will be necessary before any new development can connect to this sewer. The problem arises mainly because the surface water drains and foul water drains are combined. All new development must ensure that new foul and surface water drainage systems are provided separately. Where development is permitted, a developer contribution may be sought to help create sewer capacity by separating existing highway run-off. The sewage treatment works at Great Torrington has limited additional capacity. The need for capital schemes to improve treatment levels and to increase sewer capacity has been identified but there is no programme for such improvements at present. Development on the land allocated for housing and employment will be expected to contribute toward any necessary improvement or replacement of plant and infrastructure at the works.

Highway Drainage (DCC)
No details

Comments
Any proposed future development is likely to be in Flood Zone 1.

Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point. The Environment Agency should be consulted regarding any proposed discharges to watercourses.

However, flooding occurs periodically at Taddiport Bridge and no development that may exacerbate the flood risk or take up flood plain capacity should be permitted.

See Section 1 for further general comments.

2.7 HALWILL JUNCTION

Area Description
Halwill Junction is a linear village, having developed along the line of the old railway and the A3079 and is located 12 km (7.7 miles) south east of Holsworthy.

Main Rivers
None

Ordinary Watercourses
None

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Halwill Junction. The indicative Flood Zones 2 & 3 are shown on Figure 7.

Historical Flooding
None

Existing Flood Risk and Defences
None

Surface Water Sewers (SWW)
The northern part of the village is served by surface water sewers that discharge to a local watercourse.

Foul Water Sewers (SWW)
The foul drainage from Halwill Junction is transferred to the treatment works south of Halwill Village. There are no identified sewerage infrastructure or sewage capacity problems at Halwill Junction. Additional development of a scale appropriate to the settlement is not likely to overload existing treatment facilities.

Highway Drainage (DCC)
No details

Comments
There are no known drainage problems in the area.

Any proposed future development is likely to be in Flood Zone 1.

Discharging to a surface water sewer or watercourse may be difficult depending on the location of any proposed development. Soakaways and SuDS should be considered. Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.

The Environment Agency should be consulted regarding any proposed discharges to watercourses.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. Discharges to surface water sewers should be limited to green field run off rates.

See Section 1 for further general comments.

2.8 HARTLAND

Area Description
Hartland is located in the north west of the District, approximately 24km (15 miles) west of Bideford and 26km (16 miles) north of Bude, North Cornwall. The main route to the settlement is via the A39 and on to the B3248.

Main Rivers
None

Ordinary Watercourses
Abbey River and watercourse to the south of the village.

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Hartland. The indicative Flood Zones 2 & 3 are shown on Figure 8.

Historical Flooding
There has been one recorded flooding event from the River Abbey in 1993, two properties affected at Pattard Water.

Existing Flood Risk and Defences
None known.

Surface Water Sewers (SWW)
There are three surface water networks. The Greenwoods and Goaman Park discharge to the Abbey River. The Pengilly Way area discharges to the watercourse to the south of the village.

Foul Water Sewers (SWW)
The foul drainage for Hartland village is transferred to the treatment works to the west of the village. There are no identified sewerage infrastructure or sewage capacity problems at Hartland. Additional development of a scale appropriate to the settlement would not be prejudiced by inadequate treatment facilities.

Highway Drainage (DCC)
No details

Comments
Any proposed future development is likely to be in Flood Zone 1.

Discharging to a surface water sewer or watercourse may be difficult depending on the location of any proposed development. Soakaways and SuDS should be considered. Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.

The Environment Agency should be consulted regarding any proposed discharges to watercourses.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. Discharges to surface water sewers should be limited to green field run off rates.

See Section 1 for further general comments.

2.9 HIGH BICKINGTON

Area Description
High Bickington is situated on the B3217, approximately 13 km (8 miles) south of Barnstaple and 11 km (7 miles) east of Great Torrington

Main Rivers
River Taw

Ordinary Watercourses
Tributary of River Taw

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at High Bickington. The indicative Flood Zones 2 & 3 are shown on Figure 9.

Historical Flooding
Highway flooding around Lower Farm, Quarry Road.

Existing Flood Risk and Defences
None

Surface Water Sewers (SWW)
The surface water drainage network discharges to the watercourses to the south of the village.

Foul Water Sewers (SWW)
Foul drainage discharges to the treatment works located to the south west of the village. There are no identified sewerage infrastructure or sewage capacity deficiencies at High Bickington. Additional development of a scale appropriate to the settlement would not be prejudiced by inadequate treatment facilities.

Highway Drainage (DCC)
No details

Comments
There are no known drainage problems in the area.

Any proposed future development is likely to be in Flood Zone 1.

Discharging to a surface water sewer or watercourse may be difficult depending on the location of any proposed development. Soakaways and SuDS should be considered. Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.

The Environment Agency should be consulted regarding any proposed discharges to watercourses.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. Discharges to surface water sewers should be limited to green field run off rates.

See Section 1 for further general comments.

2.10 HOLSWORTHY

Area Description
Holsworthy is a small town, situated in the south east of the District, 26km (16 miles) south west of Bideford, in the centre of an extensive agricultural area. Holsworthy lies at the intersection of the A388 and the A3072, which provide important north – south and east – west links both within the District and beyond its boundaries.

Main Rivers
None

Ordinary Watercourses
River Deer (W and E branches)

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Holsworthy. The indicative Flood Zones 2 & 3 are shown on Figure 10.

Historical Flooding
Flooding has occurred at Derriton Bridge and Rydon Bridge but no flooding of habitable property has been recorded.

Existing Flood Risk and Defences
There is an existing flood risk to buildings both upstream of Derriton Bridge and upstream of Rydon Bridge. Risk of groundwater flooding in the level area of the Industrial Estate has been managed by ground-raising and drainage improvements.

Surface Water Sewers (SWW)
There are surface water systems in Holsworthy, generally located in the newer developments.

Foul Water Sewers (SWW)
Foul drainage discharges to the treatment works located to the south of the town. There is limited spare capacity at the sewage treatment plant. South West Water has recommended that no further provision should be made to accommodate housing development additional to sites already with a valid planning permission. The sewage treatment works is operating with only limited spare capacity that is insufficient to service additional major development. There is no programmed investment that would increase the available capacity. Additional capacity or alternative arrangements to secure satisfactory sewage treatment and the disposal of effluent will be required. Therefore, development will be expected to meet the full cost of new treatment and disposal capacity. A new STW may be required.

Highway Drainage (DCC)
No details

Comments
There is adequate provision for development outside of the flood plains. Soakaways and SuDS should be considered. Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.

The Environment Agency should be consulted regarding any proposed discharges to watercourses.

See Section 1 for further general comments.

2.11 NORTHAM

Area Description
Northam town is located adjacent to the A386, approximately 3km (2 miles) north of Bideford and 2 km (1.5 miles) south of Appledore. A westerly bypass, the B3236, leads to the tourist resort of Westward Ho! approximately 1.5 km (1 mile) west of Northam. The town is located on the eastern end of a ridge of land overlooking Northam Burrows and Bideford Bay to the north.

Main Rivers
River Torridge

Ordinary Watercourses
Knapp Stream

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Northam. The indicative Flood Zones 2 & 3 are shown on Figure 11.

Historical Flooding
There have been problems in the watercourse near to the Lenwood Country Club but the exact details are unclear.

Existing Flood Risk and Defences
From Windmill Lane south to Lower Cleave the coast is natural. From Lower Cleave to the A39 Bridge there are masonry, timber and concrete sea defences that vary in protection from 1 in 5 to 1 in 100 years.

Surface Water Sewers (SWW)
There are numerous surface water systems around Northam.

Foul Water Sewers (SWW)
Foul flows are transferred to Northam Screening Works and then to Cornborough Sewage Treatment Works. Northam Screening Works falls within Flood Zone 2.

Highway Drainage (DCC)
No details

Comments
Any significant new development is likely to be in Zone 1.

However, if development is proposed adjacent to or within Zones 2 & 3, see Section 1.2.

Also see Section 1 for further general comments.

2.12 SHEBBEAR

Area Description
Shebbear is located 12.5 km (8 miles) north-east of Holsworthy and approximately 13.5 km (8.5 miles) south of Great Torrington. The village is 0.8 km (0.5 miles) off the Class 3 County Road from Stibb Cross to Brandis Corner, which provides access to the A388 and A3072

Main Rivers
River Torridge

Ordinary Watercourses
Torridge tributary streams

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Shebbear. The indicative Flood Zones 2 & 3 are shown on figure 12.

Historical Flooding
None

Existing Flood Risk and Defences
None

Surface Water Sewers (SWW)
There are two surface water sewers. One serves the Lake Rural Workshops the other at Aisha Park.

Foul Water Sewers (SWW)
Foul drainage discharges to the treatment works located to the west of the village. Shebbear is deficient in respect of available sewerage infrastructure and sewage treatment capacity. South West Water recommends that no further provision be made to accommodate residential development in addition to sites with valid planning permissions. The sewage treatment works does not have the capacity to deal with any further development in the settlement

Highway Drainage (DCC)
No details

Comments
Any proposed future development is likely to be in Flood Zone 1.

Discharging to a surface water sewer or watercourse may be difficult depending on the location of any proposed development. Soakaways and SuDS should be considered. Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.

The Environment Agency should be consulted regarding any proposed discharges to watercourses.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. It is likely that Developers will be required to contribute towards the cost of any required improvements. Discharges to surface water sewers should be limited to green field run off rates.

See Section 1 for further general comments.

2.13 WEARE GIFFARD

Area Description
Weare Giffard is a village located on the eastern bank of the River Torridge, mid way between Bideford and Great Torrington.

Main Rivers
River Torridge

Ordinary Watercourses
Huntshaw Water

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Weare Giffard. The indicative Flood Zones 2 & 3 are shown on figure 13.

Historical Flooding
Properties that are liable to flooding are spread along a 2.7km length of river. At the upstream end (Chopes Bridge) the flooding is purely fluvial whilst at the downstream end (Annery Kiln) the flooding is principally tidal. During the 30 year period that the River Torridge flows have been monitored, fluvial flows have caused flooding on almost 100 occasions.

Existing Flood Risk and Defences
Earth banks were constructed at Annery Kiln, on the River Torridge, in 1991 and 1992 as part of the Weare Giffard Flood Alleviation Scheme. In addition Yeo Cottages and Dock Cottages were raised 1.5 metres, (6 properties altogether). Banks both upstream and downstream of the bridge were built behind the existing banks and to a higher level. The right banks were constructed to the original line and level, but the width increased and the side slopes reduced.

Surface Water Sewers (SWW)
None

Foul Water Sewers (SWW)
Foul flows are transferred to the treatment works located on the eastern bank of the River Torridge. A pumping station transfers flows from the southern part of the village.

Highway Drainage (DCC)
No details

Comments
Any proposed development in this area should be subjected to the Sequential Test. Should the Exception Test need to be applied, in the absence of a Stage 2 SFRA, the developer will be asked to provide an extensive Flood Risk Assessment.

Also see Section 1 for further general comments.

2.14 WESTWARD HO!

Area Description
Westward Ho! is a coastal village and tourist resort at the southern end of Northam Burrows and to the west of Northam.

Main Rivers
None

Ordinary Watercourses
None

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Westward Ho!. The indicative Flood Zones 2 & 3 are shown on figure 14a. Sea defences protect the shoreline. The promenade wall was last reinforced in 1935.

Historical Flooding
High tides, on shore storms and storm surges continue to overtop defences. Last recorded incident in 2008 caused flooding of properties on the Triangle.

Existing Flood Risk and Defences.
There are concrete/masonry sea defences at Westward Ho! from the slipway at Westbourne Terrace in the east to the new development at Nassau Court in the west. These were reinforced with rip-rap in the 1990's. The Pebble Ridge is a naturally formed feature that acts as a sea defence to the Burrows. There is a small section of low coastal frontage between the Pebble Ridge and the slipway that has a protection crest level of 6.64 – 6.93m. From the slipway west to Nassau Court the protection crest level varies between 7.43 – 8.16m. The SMP provides for ridge replenishment by the CPA. The potwalloping festival is an annual community event designed to reinforce the defences. Byelaws prevent removal of cobbles from the pebble ridge. Records of coastal retreat are available. Further details can be obtained from the Environment Agency on the National Flood and Coastal Defence Database. The Pebble Ridge has a protection level ranging from 5.76 – 6.91m. There also is an area of rock armoured sea defence at the northern edge of the Pebble Ridge to protect the former tip.
As geomorphological features, the pebble ridge and the 'bar' across the estuary mouth are linked to longshore drift. Natural cliffs between Nassau Court and the Westward Ho! Cliffs are susceptible to erosion and landslip.

Surface Water Sewers (SWW)
There are a number of surface water sewers serving Westward Ho! The Eastern end of the village discharges to the Burrows whereas the western side discharges directly to the sea.

Foul Water Sewers (SWW)
Foul sewage flows to the Northam Screening Works and is then pumped to Cornborough Treatment Works. The foul drainage has been known to surcharge in the past but no details are available. South West Water should be consulted regarding proposed connections to the foul sewers.

Highway Drainage (DCC)
No details.

Comments
The sea wall at Westward Ho! protects a large proportion of the properties and the land behind is high enough to be protected from tide levels but may be affected by wave action(breaking). Any site within 10m of sea defence is at risk of wave action.

The largest part of the area that is in Flood Plains 2 & 3 is Northam Burrows Country Park. This has been classed as a Site of Special Scientific Interest (SSSI) and is therefore not likely to be developed. See figure 14b.

The Pebble Ridge offers limited sea flooding protection to the Country Park but is subject to continual change due to coastal processes. It is not considered further in this report as urban development in the Country Park will not be permitted.

Proposed development adjacent to the coast should be considered on its own merits. A Flood Risk Assessment should be produced to consider the effect of tide levels.

South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems.

See Section 1 for further general comments.

2.15 WINKLEIGH

Area Description
Winkleigh is the second largest village in the District. It is situated at the south eastern margin of the District, approximately 19 km (12 miles) from Great Torrington and 14 km (9 miles) from Okehampton, West Devon in the south.

Main Rivers
None

Ordinary Watercourses
Bullow Brook

Flood Storage Areas and Flood Zones
There are no designated flood storage areas at Winkleigh. The indicative Flood Zones 2 & 3 are shown on figure 15.

Historical Flooding
Flooding in October 2008 at Westacot Lane, Bullow View near the school due to a blocked culvert.

Existing Flood Risk and Defences.
None

Surface Water Sewers (SWW)
There are presently only two surface water sewers in Winkleigh. One serves the Kings Meadow estate the other at Bullow View.

Foul Water Sewers (SWW)
There are two foul water pumping stations, one at Bullow View the other at Kings Meadow. Foul flows are transferred to the sewage treatment works situated to the south east of the village. Winkleigh is deficient in respect of available sewerage infrastructure to accommodate further residential development and sewage treatment capacity. To remedy known treatment problems, interim sewage treatment improvements were completed prior to 1993, after which sewage treatment restraints were removed in 1996. Further substantial development will overload the existing sewage treatment works, which is approaching its design capacity. The dilution afforded by Bullow Brook also limits the volume of effluent that can be discharged no matter what improvements are made to the treatment works. Additional development on new housing allocations will not be permitted unless deficiencies in sewage treatment and effluent discharge are resolved.

Highway Drainage (DCC)
No details

Comments
Any proposed future development is likely to be in Flood Zone 1.

Discharging to a surface water sewer or watercourse may be difficult depending on the location of any proposed development. Soakaways and SuDS should be considered.
Proposed surface water connections to any watercourse should be evaluated to ensure flood risk is not increased downstream or at the discharge point.
The Environment Agency should be consulted regarding any proposed discharges to watercourses.
South West Water should be consulted regarding any proposed discharges to the foul and surface water sewerage systems. It is likely that Developers will be required to fund the cost of any required improvements. Discharges to surface water sewers should be limited to green field run off rates. A new STW may be required.
See Section 1 for further general comments.

3.0 Recorded Flooding Outside of the main catchments outlined in this report - taken from the Environment Agency Flooding Incident Database

Location	Cause	Watercourse	Flooded Area	Date	Grid Ref.
Stoke End	F	Abbey	Unknown	1996	SS 2310 2490
Lymebridge	F	Stream	Unknown	1996	SS 2350 2290
Philham	F	Stream	Unknown	1995	SS 2590 2285
Brimford Bridge	F	River	Highway	1983	SS 2810 1730
Chapel & Highford Farm	F	Stream	Unknown	1996	SS 2950 2400
Fordmill Bridge	F	River Torridge	Unknown	1996	SS 3250 1785
Ashmill Bridge	F	River Torridge	Highway	1996	SS 3390 1720
Sutcombe Mill Sutcombe	F	River Waldon	Highway Gardens/land	1983	SS 3470 1100
Dipple Bridge	F	Torridge	Unknown	1996	SS 3500 1785
Parkham	L	Land	Building	2007	SS 3658 2077
East Putford	L	Land	Building	2007	SS 3722 1754
Milton Damerel	F	River Waldon	Highway	1983	SS 3770 1030
Milton Damerel	F	River Waldon	Unknown	1996	SS 3780 1030
Haytown Bridge	F	River Waldon	Unknown	1996	SS 3830 1430
Withypool Bridge	F	River Waldon	Buildings	1996	SS 3920 0990
Brandis Corner	D	Drainage	Buildings and highway	2000	SS 4105 0394
Little Lashbrook	F	River Waldon	Highway	1983	SS 4015 0675
Cookbury to Woodcock	F	River Waldon	Highway	1996	SS 4020 0680
Thornbury Mill Bridge	F	River Waldon	Highway	1994	SS 4030 0940
Bason Bridge	F	River Waldon	Highway	1983	SS 4130 0800
Gidcott Mill	F	River Torridge	Unknown	1996	SS 4200 0940
Ladford Mill	F	Stream	Unknown	1996	SS 4230 1140
Abbotsham	L	Land	Highway	2007	SS 4275 2631
Dipper Mill	F	River Torridge	Highway	1983	SS 4380 0650
Dipper Mill Shebbear	F	River Torridge	Gardens/land & roads	1963,96	SS 4385 0660
Rudha Bridge	F	River Yeo	Highway	1983	SS 4400 2250
Little America	F	River Yeo	Highway	1974	SS 4600 2365
Black Torrington	F	River Torridge	Roads	1980,83,96,95	SS 4690 0610
Horsehoe Bridge	F	Mussel Brook	Unknown	1996	SS 4730 0930

F – Fluvial
L – Land drainage
D – Surface water drains