TORBAY COUNCIL

WATER CYCLE STUDY

FINAL REPORT

March 2012

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1.0 Introduction

1.1 Background

Torbay Council has produced this water cycle strategy building on work previously undertaken in the area and will form part of a wider, holistic, evidence base to feed into the Local Development Framework. The study will inform the planned growth within the Councils area and help Torbay to prepare for the new challenges of climate change and Government Policies and European legislation, including the Water Framework Directive and European Habitats Directive. The need for this evidence base is discussed further in Section 3.2.3.

The level of growth currently planned in the Council's emerging Core Strategy is, broadly, the delivery of around 500 new homes and 800 new jobs per year over the plan period to 2031, regeneration of the three town centres and conservation of the built and natural environment.

1.2 Aims and Objectives

The objective of the Torbay Water Cycle Strategy is to identify any constraints on housing and employment growth planned for Torbay Council up to 2031 that may be imposed by the water cycle and how these can be resolved. Furthermore, it will provide a strategic approach to the management and use of water which ensures that the sustainability of the water environment in the region is not compromised.

This study has undertaken a review and provided an overview of the following specific areas:

- Capacity issues with regards to water treatment works, clean water network and water resources in Torbay.
- Capacity issues with regards to wastewater treatment capacity and wastewater network (pipe routes) in Torbay.
- Potential impacts of future water abstraction and wastewater discharge near water dependent European Sites.
- Water quality issues with respect to the discharge of wastewater and surface water, groundwater quality, and management of gravity and pumped discharges within the Torbay administrative area.

The impacts of flood risk within the Torbay Council administrative area have been assessed within the Torbay Council Level 1 and Level 2 Strategic Flood Risk Assessments.

The water cycle study has been undertaken following initial discussions with, and using data provided by the following key stakeholders:

- Torbay Council
- South West Water
- Environment Agency

2.0 Torbay Water Cycle Study

2.1 The Water Cycle

In the simplest form, the Water Cycle can be defined as the process by which water is continually recycling between the earth's surface and the atmosphere. Without considering human influences, it is simply the process by which rain falls , and either flows over the earth's surface or is stored (as groundwater, ice or lakes) and is then returned to the atmosphere (via evaporation from the sea, the soil, surface water or animal and plant life) ready for the whole process to repeat again.

In the context of the study, the water cycle has a broader definition than the simple water or hydrological cycle. The human influence on the water cycle introduces many new factors into the cycle through the need to abstract water from the natural environment, use it for numerous purposes and then return it to the natural system as highlighted in Figure 1. The development and introduction of technology such as pipes, pumps, drains and chemical treatment processes has meant that human development has been able to manipulate the natural water cycle to suit its needs and to facilitate growth and development. Water Cycle in this context is therefore defined as both the natural water related environment (such as rivers, wetland ecosystems, aquifers, watercourses, etc.) and the water infrastructure (hard engineering focused elements such as water treatment works, supply pipelines and pumping stations) which are used by human activity to manipulate the cycle.

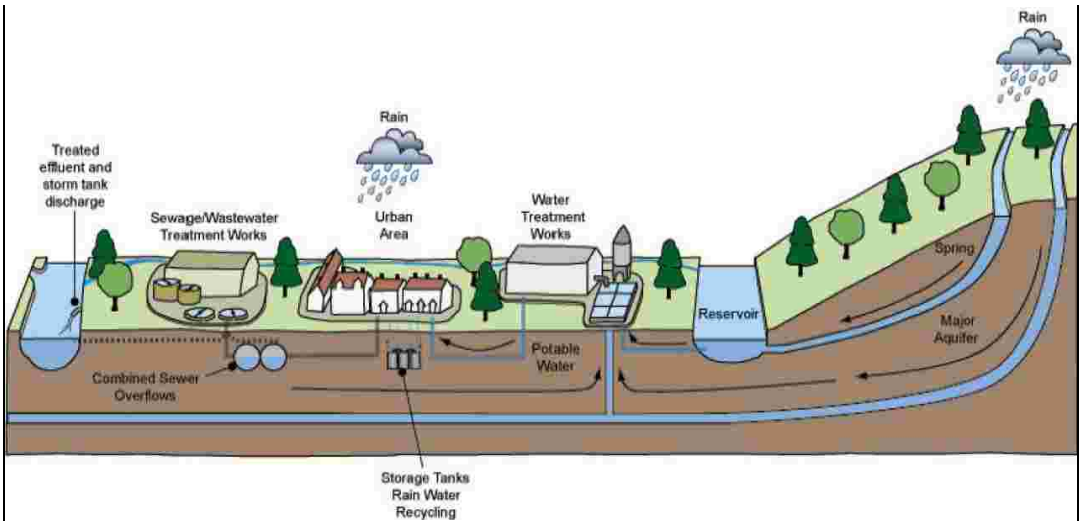

Figure 1: The Water Cycle Study

2.2 Implications for Development

In directly manipulating elements of the water cycle, man affects many changes to the natural water cycle which can often be negative. To facilitate growth and development, there is a requirement for clean water supply which is taken from natural sources (often depleting groundwater stores or surface water systems), the

treatment of waste water which has to be returned to the system (affecting the quality of receiving waters) and the alteration and management of natural surface water flow paths which has implications for flood risk. These impacts can indirectly affect ecology which can be dependent on the natural features of a water cycle.

In many parts of the UK, some elements of the natural water cycle are considered to be at, or close to the limit in terms of how much more they can be manipulated. Further development will lead to an increase in demand for water supply and a commensurate increase in the requirement for waste water treatment; in addition flood risk may increase if development is not planned for in a strategic manner. The sustainability of the natural elements of the water cycle is therefore at risk.

A water cycle study is an ideal solution to address this problem. It will ensure that the sustainability of new development is considered with respect to the water cycle, and that new water infrastructure introduced to facilitate growth is planned for in a strategic manner; in so doing, the water cycle study can ensure that provision of water infrastructure is sufficient such that it maintains a sustainable level of manipulation of the natural water cycle.

2.3 Stages of a Water Cycle Study

Current guidance on water cycle studies suggests that they should generally be undertaken in three stages, dependant on the status of the various Local Development Documents, as part of the wider Local Development Framework, being prepared by Local Planning Authorities for submission. To coincide with Torbay's timescales for responses and submissions only a scoping/outline water cycle study is being produced.

2.3.1 Outline Water Cycle Study

The outline study determines the key water cycle areas where development is likely to either impact on the water environment, or is likely to require significant investment in water infrastructure (i.e. pipes or treatment) to service new development.

Its key purpose is to define whether there are significant constraints that would need further assessment to determine whether they affect either the locations of allocation options, or the amount of development that can be provided within the allocation site.

It is a high level assessment that looks at town wide or area wide issues. The level of assessment covers whether:

- There is a potential for an area wide negative supply and demand balance for potable water i.e. demand is likely to be greater than supply for the growth area;
- There are ecologically sensitive sites that have a hydrological link to development e.g. a SAC wetland site located on a river downstream of discharges from a wastewater treatment works;
- A town has a history of sewer flooding and hence potential restrictions on new connections from development;
- Local watercourses have water quality concerns which will be made worse if further discharge of wastewater from new development occurs.

- A town has constraints associated with flood risk, in particular river and tidal flooding but also surface water, groundwater and artificial sources (reservoirs, canals, etc.)

A scoping study therefore defines the study area, defines the key stakeholders required to input to the study and concludes what issues require further investigations and therefore, what the scope of the outline water cycle study should be.

The outline study considers all of the ways in which new development will impact on the water environment or water infrastructure specific to where growth is most likely to be targeted. It is usually undertaken during consideration of allocation sites such that it can inform the decision process in terms of where development will be targeted. The key aim of the outline study is to provide Local Planning Authorities with the evidence base which ensures that water issues have been taken into account when deciding the location and intensity of development within an authority's planning area as part of the development of the Core Strategy. It also aids in setting core policies for development management purposes. Finally, it gives the water company an evidence base to its business plans which determine how much they can charge customers to invest in upgrades and the provision of new infrastructure required to service proposed development.

2.4 Integration with the Planning System

As part of the Local Development Framework process, local planning authorities are required to produce evidence based studies which support the selection processes used in deciding on final growth targets and areas to be promoted for growth. The water cycle strategy is one such example of an evidence based study which specifically addresses the impact of proposed growth on the water cycle.

The water cycle strategy will make up one of a number of strategic studies and plans which will form part of the evidence base supporting the production of Torbay's Local development Framework. Specifically, the water cycle strategy will form an important basis of the Torbay Core Strategy, as well as providing input to the development of development management policies to assist in ensuring the delivery of water cycle management requirements at the local planning application level. There is a strong inter relationship between the water cycle strategy and other components of the local development framework evidence base.

It is therefore important that the findings of the water cycle strategy feed into the Core Strategy and build on the conclusions of other studies the Council has undertaken, in particular the Torbay Strategic Flood Risk Assessment, the Strategic Housing Land availability Assessment (SHLAA) and the Infrastructure Delivery Study.

2.5 Data Availability

Undertaking of a water cycle study requires a large amount of data collection, much of which is reliant on the willingness of third parties to supply in order to allow the study to be progressed. In some cases, the availability of data with respect to water cycle infrastructure and future planning is not available within the time required to undertake the assessment and various assumptions have to be used to enable the study to continue.

3.0 Development in Torbay

3.1 Torbay

Torbay is located in South Devon and shares administrative boundaries with Devon County Council, Teignbridge District Council and South Hams District Council. It covers an area of approximately 62 km^2. Historically, the main settlements have developed around coastal locations used both for industry and tourism. The main settlements are Torquay, Paignton and Brixham, with further smaller settlements distributed across the district. Figure 2 provides an overview of the study area.

3.2 National, Regional and Local Drivers and Policies

3.2.1 National Drivers and Policies

The growth within Torbay is now driven by local planning policy, but any growth and changes to the environment will need to comply with the main EU Directives and United Kingdom legislation and guidance on water as outlined in Table 3.1.

Table 3.1

EU Directives and UK Legislation

Directive/Legislation	Description
Bathing Waters Directive	To protect the health of bathers and maintain the aesthetic quality if inland and coastal bathing waters.
Code for Sustainable Homes	The code for sustainable homes has been introduced to drive a step change in sustainable home building practice, providing a standard for key elements of design and construction which affect the sustainability of a new home.
Environment Act 1995	Sets out the roles and responsibilities of the Environment Agency
Flood and Water Management Act 2010	Provides new statutory duties to lead local flood authorities especially with regards to investigating flooding, register of strategic flood assets, production of a local strategy and setting up of a Sustainable Urban Drainage Approval Body (SAB) which will be required to review, approve, adopt and maintain all new sustainable drainage systems that serve more than one property.
Flood Risk Regulations 2009	Requirement for all Lead Local Flood Authorities to produce a Preliminary Flood Risk Assessment.
Environmental Protection Act 1990	Integrated Pollution Control system for emissions to air, land and water.
Future Water, 2008	Sets the Government's vision for water in England to 2030.
Groundwater Directive	To protect groundwater against pollution by list 1 and 2 dangerous substances.
Habitats Directive	To conserve the natural habitats and to conserve wild fauna and flora with the main aim to promote the

	maintenance of biodiversity taking account of social, economic, cultural and regional requirements.
Making Space for Water 2004	Outlines the Government strategy for the next 20 years to implement a more holistic approach to managing flood and coastal erosion risks in England.
Planning Policy Statements and Planning Policy Guidance (due top be replaced by the National Planning Policy Framework – NPPF in Spring 2012)	Planning policy in the UK is currently set by Planning Policy Statements (PPS). These explain statutory guidelines and advise local authorities and others on planning policy and operation of the planning system. The most relevant PPS to a water cycle strategy are: PPS1 – Delivering Sustainable Development PPS3 – Housing PPS4 – Planning for Sustainable Economic Growth PPS9 - Biodiversity and Geological Conservation PPS12 – Local Development Frameworks PPS23 – Planning and Pollution Control PPS25 – Development and Flood Risk
Pollution Prevention and Control Act 1999	Implements the IPPC Directive.
Water Act 2003	Implements changes to the water abstraction management system and to regulatory arrangements to make water use more sustainable.
Water Framework Directive	The Water Framework Directive passed into UK law in 2003. The general requirement of the directive is that all river basins must achieve good ecological status by 2015 or by 2027 if there are grounds for derogation. The Environment Agency is the body responsible for the implementation of the Water Framework Directive in the UK.
Water Resources Act 1991	Protection of the quantity and quality of water resources and aquatic habitats. Parts of this Act have been amended by the Water Act 2003.

3.2.2 Regional Drivers and Policies

Draft Regional Strategy for the South West

The Regional Spatial Strategy for the South West was published in June 2006 and set targets to guide the scale and location of growth within Torbay up to 2026. Subsequently a revised draft Regional Spatial Strategy was published in July 2008 incorporating changes proposed by the Secretary of State. This document included spatial policies relating to water and flooding which are forming part of the driver for the Water Cycle Strategy. Those of particular relevance are identified as follows:

- SD2: Climate Change
- Development Policy F – Planning and delivery of major development
- Development Policy G – Sustainable construction
- F1 – Flood Risk
- RE6 – Water Resources

These policies are now only of historical interest in view of the Government's proposed abolition of Regional Spatial Strategies. They remain, however a useful guide and infrastructure context for consideration of key water cycle issues at a regional level.

Water Resources Strategy – Regional Action Plan for the South West

The Environment Agency published its Water Resources Strategy for England and Wales in March 2010. In addition, Regional Action Plans were produced and the plan for the South West was published in December 2009. This provides a number of regional actions against strategy objectives. Those actions with particular relevance to local planning authorities are identified below:

- SW4 – The resilience of supplies and critical infrastructure is increased to reduce the impacts of climate change. (Recommend that major developments are subject to a Water Cycle Strategy)
- SW20 – Catchment management is integrated so that impacts on water resources and the water environment are managed together. (Recommend sustainable drainage in all new developments)
- SW30 – New and existing homes and buildings are more water efficient. (Recommend that all new homes are built to at least level 3 of the Code for Sustainable Homes)
- SW31 – New and existing homes and buildings are more water efficient. (Recommend that all new commercial and public sector buildings are built to at least level 3 of the Code for Sustainable Homes)
- SW32 – New and existing homes and buildings are more water efficient. (Encourage rainwater harvesting and greywater recycling)
- SW33 – New and existing homes and buildings are more water efficient. (Potential for water neutral development)

3.2.3 Local Drivers and Policies

Local Development Framework

The Local Development Framework for Torbay is a statutory spatial development plan and comprises a portfolio of documents including the Core Strategy and supporting Development Plan Documents. The Local Development Framework sets out the spatial strategy, policies and proposals to guide the future development and use of land within Torbay up to 2031. Torbay Council must ensure it coordinates and prepares the Local Development Framework documents and policies, including preferred development locations, infrastructure and delivery plans that have had regard to the intent and steer from national policies, as well as local aspirations, needs and demands.

The Core Strategy is the overarching development plan document that provides the strategic framework for related Local Development Framework development plan documents and supplementary planning documents. These will deliver the Core Strategy spatial strategy, policies and targets at the local level. All these plans must conform to the Core Strategy and help to deliver its vision and strategic objectives. The Council may also produce supplementary planning documents that provide further guidance to support policies in the development plan documents.

The Localism Act will introduce Changes to the planning system during 2012 that are likely to result in the retention of an overarching Core Strategy (or Local Plan) for Torbay, and the preparation of Neighbourhood Plans for Torquay, Paignton and Brixham. These Neighbourhood Plans will contain the details previously introduced for Local Development Framework site allocation documents.

It is essential that these documents are all informed using the findings and advice from a sound evidence base that examines economic, social and environmental needs and constraints. This must include the comprehensive planning, phasing, delivery and management of water, sewerage, flooding and drainage infrastructure, whilst not adversely affecting environmental capacity. A critical element is therefore to consider in greater detail, the risks associated from all forms of flooding and the existing state, limitations and future requirements of the Torbay water cycle system in the context of future growth.

Torbay's Local Development Framework will set out the plan for directing development within the area. The choice of where to locate new development, and where required, new waste water sites, will directly impact on one another. Due to this the findings of the water cycle strategy will be important in future alterations to the local development framework, in particular, the Core Strategy, site allocations and development, management and proposals map.

Water Company Planning

It is important to consider the planning timelines, both for Torbay Council in terms of the Local Development Framework but also South West Water in terms of the funding mechanism for new water supply and water treatment infrastructure.

There are two elements of water company planning that are pertinent to the water cycle strategy and specifically with regard to integration with spatial planning timelines for local planning authorities.

Financial and Asset Planning

Water companies currently plan for asset management and the financial procurement required for it through the asset management plan process which runs in a five year cycle. The water services regulatory authority (OFWAT) is the economic regulator for the water and sewerage industry in England and Wales and regulates this overall process.

In order to undertake maintenance of its existing assets and to enable the building of new assets, water companies seek funding by charging customers according to the level of investment they need to make. The process of determining how much asset investment required is undertaken in conjunction with:

- The Environment Agency as the regulator determining investment required to improve the environment. This is a two way process between the Environment Agency and the Water Companies and is conducted through the National Environment Programme.
- The Drinking Water Inspectorate who determine through a two way process with the Water companies where investment is required to assets to improve quality of drinking water.

- OFWAT who along with the Environment Agency require Water Companies to plan sufficiently to ensure security of supply of potable water to customers during dry and normal years.

The outcome of this process is a business plan which is produced by each water company setting out the required asset investment over the next five year period, the justification for it and the price increase required to fund it.

OFWAT determines how much a water company can charge its customers and considers views of the water company, regulators and consumer groups. This process is known as the price review and is undertaken on a five year cycle. This review allows OFWAT to determine the price limits for the proceeding five years that allow the water company to raise funds required for necessary investment into asset management (the AMP period).

At the time of undertaking the Torbay water cycle strategy, funding for asset investment has been set for the five year period 2010–15 (AMP5). The next submission of the strategic business plans will be for the price review in 2014. These seek funding for asset investment for the five year period 2015-20.

Any new asset or infrastructure investment required to meet the requirements of the water cycle strategy and hence future development in Torbay will need to be included within these strategic business plans.

As OFWAT has determined the price limits for the AMP5 period, where significant water infrastructure requirements are not included within this price review, funding cannot be sought until the next price review process which will be towards the end of the AMP5 period. Only in exceptional circumstances will water companies seek to deviate from their water resource management plan and submit an interim determination within the five year AMP cycle to provide funding for unforeseen investment requirements. However, these have significant cost implications and it is considered that infrastructure for planned development should be planned for in sufficient time to be included in the relevant business plan and price review therefore are avoided.

Water Resource Planning

Water companies produce water resource management plans on a statutory basis covering 25 year planning horizons. Water resource management plans set out how a water company plans to provide and invest in existing and new water resource schemes to meet increase in demand for potable supply, as a result of new development, population growth and climate change over the next 25 year period. The statutory water resource management plans will be updated in five yearly cycles to coincide with the price review and AMP process. Unlike several other water company water resource management plans, South West Waters plan was approved for publication by Defra in August 2009 and includes information on how they plan to ensure provision of water resources to supply growth in the Torbay study area.

The water cycle strategy is essential for a number of reasons. It allows discrepancies in the planning timeframes of South West Water and Torbay Council to be reconciled through strategic planning, as well as providing sufficient evidence base for Torbay Council's statutory local development framework process and robust

evidence and justification for South West Water strategic business plans for future investment requirements.

Additional Information

In addition to the legislation and guidance set out above, the following studies and reports are relevant and have been used within the Torbay Water Cycle Strategy.

- Environment Agency – Teign, Torbay and South Hams Catchment Abstraction Management Strategy (2007)
- Torbay Council - Level 1 Strategic Flood Risk Assessment (2008)
- Torbay Council – Level 2 Strategic Flood Risk Assessment (2010)

4.0 Water Cycle Environment and Infrastructure Baseline

4.1 Introduction

This section describes the environment and infrastructure baseline within Torbay with regards to the various components for the water cycle. It is important to establish the baseline of the water environment and associated water/wastewater infrastructure because a basic assumption of the Water Cycle Strategy is that it is preferable to maximise the use of existing facilities without causing negative effects upon the existing water environment. This is to reduce cost, reduce the impact to existing communities and to allow phasing of some new development, negating the need to rely on longer lead in times associated with securing funding for new infrastructure through the statutory water company planning process.

Initial assessments of the potential impacts from the proposed level of growth in Torbay and recommendations for further investigation are provided in Section 5. It is important to note that this study aims to present the baseline and identify any likely constraints.

4.2 Water Resources and Supply

4.2.1 Climate

The climate within the Torbay area results in average annual rainfall of 1008mm per year. The majority of evapotranspiration occurs during the summer months with aquifer and reservoir recharge occurring during the winter months.

4.2.2 Geology and Groundwater

Groundwater flooding occurs as a result of water rising up from an underlying aquifer or from water from abnormal springs. This tends to occur after long periods of sustained rainfall, and the areas at most risk are often low-lying where the water table is likely to be at a shallow depth. Groundwater flooding is known to occur in areas underlain by major aquifers, although increasingly it is also being associated with more localised floodplains sands and gravels.

The geotechnical framework of the Torbay area is complex, not only in terms of the lithological variations that abound, particularly in the Devonian strata, but also because of the complexity of the geological structure. Most of Torbay is underlain by a mixture of limestone, sandstone, breccias, mudstones, shales and slates; however, in the low-lying coastal areas and old river valleys relatively recent (in geological terms) alluvial and marine deposits are found.

There is limited detailed information available on flood risk from groundwater within the historical flooding records for Torbay. Although groundwater may have been a contributing factor to a number of flooding incidents, there have been no significant incidents reported from groundwater flooding. It should be noted, however, that a

number of historic flooding events identify groundwater contributing as an additional source of flooding.

4.2.3 Rivers

Within the Torbay area there are seventeen watercourses of which thirteen discharge directly to the English Channel. Two discharge to the River Dart, one discharges to the River Teign and one discharges to the combined sewer system. Due to the severity of the flooding from eight of these watercourses, in April 2006 these watercourses were enmained and re-categorised as main rivers. The main rivers within Torbay are as follows:

- Aller Brook, Torquay
- Occombe Valley Watercourse, Paignton
- Victoria Stream, Paignton
- Clennon Valley Watercourse, Paignton
- Yalberton Watercourse, Paignton
- Churston Watercourse, Brixham
- Higher Brixham Watercourse, Brixham
- Galmpton Watercourse

The ordinary watercourses within Torbay are located as follows:

- Maidencombe Watercourse, Torquay
- Watcombe Watercourse, Torquay
- River Fleet, Torquay
- Ilsham Valley Watercourse, Torquay
- Torre Valley Watercourse, Torquay
- Cockington Stream, Torquay
- Hollicombe Watercourse, Paignton
- Broadsands Watercourse, Paignton
- Lupton Watercourse, Brixham

The lower reaches of the majority of these main rivers and ordinary watercourses are tidally influenced. It should be noted that the Aller Brook drains into the River Teign and the majority of this main river is covered within the Teignbridge Water Cycle Study.

4.2.4 Abstractions

Within the study area, the largest proportion of abstractions of raw water in relation to quantity is for energy and amenity purposes; however, these uses are non-consumptive (can be treated and returned as surface water for additional use) and therefore have little impact on the overall available resources. The main consumptive uses within the area are for public water supply and a lesser amount for industry and agriculture.

4.2.5 Water Resource Management

Availability of water resources within a catchment are assessed and monitored by the Environment Agency through the Catchment Abstraction Management Strategy (CAMS) process. Within each CAMS area, river catchments are split into a number of individual Water Resource Management Units (WRMU). In addition, where there are significant groundwater sources, Groundwater Management Units (GWMU) are also identified. The available water resources are assessed and categorised into one of the following:

- Water available – Water is likely to be available at all flows including low flows. Restrictions may apply.
- No water available – No water is available for further licensing at low flows. Water may be available at higher flows with appropriate restrictions.
- Over licensed – Current actual abstraction is such that no water is available at low flows. If existing licences were used to their full allocation they could cause unacceptable environmental damage at low flows. Water may be available at high flows, with appropriate restrictions.
- Over abstracted – Existing abstraction is causing unacceptable damage to the environment at low flows. Water may still be available at high flows with appropriate restrictions.

These documents provide strategies for the management of water resources at a local level and set out how existing and future water abstraction will be managed. The CAMS identify where water is available, and also, if relevant, where current rates of abstraction need to be reduced to allow balance between the needs of abstractors, other water users and the aquatic environment to be considered.

There is one CAMS that covers the Torbay area, which is:

- The Teign, Torbay and South Hams CAMS

Due to the differences between administrative boundaries and river catchments, a number of the WRMU's also encroach into neighbouring authority areas. Table 4.1 provides a brief summary of the WRMU that is found wholly or partially within the Torbay area.

Table 4.1

Water Resource Management Units in Torbay

CAMS Document	Management Unit and Name	Resource Availability Status		
		Individual Status	Target for 2011	Target for 2017
Teign, Torbay and South Hams	WRMU 1 – Aller Brook	Water Available	Water Available	Water Available

It should be noted that the above is based on the best available information publicly available, however, the second CAMS cycle commenced in 2008. As part of the second cycle all of the CAMS will be reviewed and updated as part of a live rolling process. This will be completed shortly and may alter the water availability status

within some areas. It is understood that the terminology and methodology has changed, however, this information has not been provided for the purpose of this study.

4.2.6 Water Supply

Within the south west, due to the distribution of settlements and seasonal demand on water resources, South West Water has developed three Strategic Supply Areas (SSA). SSA's are water resource zones that are the largest zones in which all resources (including external transfers) are shared and therefore a zone where customers experience the same risk of supply failure from a resource shortfall.

Roadford SSA relies predominantly on Roadford Reservoir, which is operated conjunctively with ten impounding reservoirs (Kennick, Totiford, Trenchford, Avon, Meldon, Burrator, Wistlandpound, Fernworthy, Upper Tamar Lakes and Venford), seventeen river intakes and other sources (groundwater).

Clean water is supplied directly to the Torbay area from a number of Water Treatment Works.

4.3 Flood Risk

4.3.1 Torbay Council Strategic Flood Risk Assessments

Torbay Council completed its Level 1 Strategic Flood Risk Assessment in October 2008 and the Level 2 Strategic Flood Risk assessment in December 2010 following the publication of Planning Policy Statement 25 (PPS25): Development and Flood Risk in December 2006 and revised in 2010. Both of these documents are available online to assess flood risk.

These documents allow Torbay Council to assess potential allocations for future development using the PPS25 Sequential Test that aims to steer new development to areas with the lowest flood risk first. Figures 3, 4, 5 and 6 provide details of the Flood Zones as defined by PPS25 for Torquay, Paignton, Galmpton and Brixham respectively. These identify that whilst there is land identified as being at risk from flooding, there are areas available surrounding the urban extent that are located within Flood Zone 1 (low probability of flooding) where future development can be directed to minimise the risk from fluvial and tidal flooding. In addition to the Flood Zone maps within the Level 1 Strategic Flood Risk Assessment, details relating to both sewer flooding and highway flooding are included.

It should be noted that there is limited data provided within the Level 1 Strategic Flood Risk Assessment regarding surface water, groundwater, and artificial sources of flooding. These should also be taken into consideration when locating future development to ensure that all sources of flooding are considered.

The Environment Agency have produced and issued to Local Resilience Forums and Local Planning Authorities, mapping to identify "Areas Susceptible to Surface Water Flooding" (ASTSWF) that is available for spatial planning purposes to identify locations across Torbay that are "More", "Intermediate", or "Less" susceptible to surface water flooding. In addition, as part of the works undertaken in the production of the Level 2 Strategic Flood Risk Assessment, flood risk and depth maps for both

pluvial and fluvial flooding have been prepared for the most significant flood risk areas within Torbay.

4.3.2 Tidal Flood Risk

Tidal flood sources include the sea and the interaction between the sea and main river/watercourse outfalls. A number of locations along the coastline of Torbay are at risk from tidal flooding due to high tides combined with strong easterly winds. The seafront areas that are most at risk from tidal flooding include Torre Abbey, Livermead, Paignton, Preston, Goodrington and Broadsands.

The lower reaches of a number of main rivers and watercourses are protected from direct tidal inundation; fluvial flooding levels can become elevated in areas of tidal influence. In these locations outfalls are typically flapped to prevent tidal inflow, depending on fluvial and tidal interactions. During high tides the flaps are closed (tide locked) allowing limited or no discharge and river water from upstream is backed up and stored within either the channel or drainage infrastructure. At low tide the flaps are able to flow freely enabling river water/surface water discharges to drain. During higher tidal events there is a longer period that these outfalls are tide locked and when this occurs during storm events resulting in high river flows it is possible for the channel capacity to be exceeded causing flooding.

4.3.3 Fluvial Flood Risk

Fluvial flood sources are those associated with main river and watercourses. Fluvial flooding occurs when the flows within these main rivers and watercourses are high as a result of a storm event and the capacity of the channel or culvert is exceeded causing flooding.

4.3.4 Surface Water Flooding/Overland Flood Risk

Surface water flooding and overland flow typically arise from intense rainfall, often of short duration, that fails to infiltrate the surface or enter drainage systems. As a result surface water travels over the ground surface and can result in local flooding. The local topography and built environment have a strong influence on the direction and depth of overland flow.

Figures 7, 8, 9 and 10 highlight the areas at risk from surface water flooding throughout Torbay.

4.3.5 Sewer Flooding

Sewer flooding arises when the capacity of a sewer system is exceeded either as a result of a rainfall event which generates more flows than can be accommodated within the sewer system or there is a blockage within the sewer system which prevents the sewage effluent from flowing. Both situations can result in the sewer system overflowing or surcharging.

Modern sewer systems are normally designed to cater for rainfall events with a 1 in 30 year return period. However, older systems were often constructed without consideration of a design standard and therefore some areas may be served by sewers

with an effective design standard of less than 1 in 30 years. As a result rainfall events with a return period greater than 1 in 30 years would be expected to result on flooding to some parts of the sewer system.

As the urban areas of Torbay have expanded to accommodate growth, the original sewer systems have rarely been upgraded and as a result these may become overloaded. This flooding problem will be compounded by climate change, which is forecast to result in milder winters and increased rainfall intensity during summer months. The combination of these factors will increase the pressure on existing sewers systems, effectively reducing their design standards and increasing the frequency of flooding.

The main sewer catchment areas and the areas that have historically suffered sewer flooding are highlighted in Figures 11, 12, 13 and 14.

4.3.6 Groundwater Flooding

Groundwater flooding occurs when water levels in the ground rise above surface elevations. Groundwater flooding may take weeks or months to dissipate, as groundwater flow is much slower that surface water flows and therefore water levels take much longer to recede.

There is only limited information known about groundwater flooding problems in Torbay therefore it can be assumed that flood risk from groundwater is localised. It is noted, however, that in low lying areas around the coast groundwater levels are known to be influenced by tidal conditions, resulting in flooding to basement properties in these areas. With the effects of climate change causing sea level rise in the future, the risk of groundwater flooding in these coastal areas will increase in the future.

4.4 Waste Water Treatment and Collection

The principal waste water treatment works in the Torbay area is at Brokenbury between Paignton and Brixham. This treatment works serves the significant proportion of developments within Torquay, Paignton, Brixham and Galmpton. Following treatment the treated effluent is discharged to the English Channel off Sharkham Point in Brixham.

Foul flows from the newer development areas at Scott's Bridge in Torquay discharge to the Aller trunk sewer system which eventually discharges to the Buckland wastewater treatment works in Newton Abbot from where the treated effluent discharges to the tidal River Teign.

There are a number of areas of Torbay that are not connected to the main sewerage system such as Maidencombe and an area around Churston between Paignton and Brixham. These areas are served by private septic tanks and there are no proposals at present to connect these areas to the main sewer system

Initial discussions with South West Water indicate that at present Brokenbury Wastewater Treatment Works is nearing its design capacity. Investigations into the capacity of the treatment works to provide for future development within the Torbay area will be required to confirm the existing capacity and required capacity to ensure phasing of upgrades (where required) are in line with proposed development phasing.

This will ensure that infrastructure capacity issues are kept to a minimum whilst enabling development in a phased manner.

As previously identified foul drainage from the Scott's Bridge area of Torquay drains to the Buckland Wastewater Treatment Works in Newton Abbot. This area of Torquay is identified as an area for future development. In addition to the proposed developments in Torquay draining to Buckland there are significant development proposals within the Teignbridge District Council area of Newton Abbot resulting in the likelihood of this treatment works needing upgrading. As with Brokenbury, similar investigations of existing and future capacity to ensure phasing of upgrades will be required.

4.5 Water Quality

Water quality is monitored by the Environment Agency for a number of rivers and locations within Torbay to provide the status of current ecological quality. This is classified by the monitoring and assessment of the quality of biological, physic-chemical, hydro-morphological and specific pollutants. The ecological status of rivers and watercourses within Torbay are classified in line with the Water Framework Directive classifications. The current classification for these rivers, watercourses, coastal waters and groundwater within Torbay are identified in tables 4.2 and 4.3.

Table 4.2

Current Ecological Status for Rivers and Watercourses within Torbay based on Water Framework Directive Classification

Water Body ID	Water Body	Current Ecological Quality
GB108046005330	Aller Brook	Good
GB108046005320	Hollicombe Stream	Moderate
GB108046005310	Occombe Valley Watercourse	Moderate
GB108046005300	Clennon Valley Watercourse	Moderate
GB108046005150	Yalberton Watercourse	Moderate
GB108046005090	Galmpton Watercourse	Good
GB108046005290	Lupton Watercourse	Moderate

Table 4.3

Current Ecological Status for Coastal Waters and Groundwater within Torbay based on Water Framework Directive Classification

Water Body ID	Water Body	Current Ecological Quality
GB680806320000	Torbay – Coastal	Moderate
GB680806420000	Lyme Bay West – Coastal	Moderate
GB40801G801500	Torquay – Groundwater	Good
GB40801G801600	Paignton & Brixham – Groundwater	Good

Tighter standards under the Water Framework Directive are likely to require tightening of existing discharge consents and reduction of diffuse sources entering the watercourses and main rivers of Torbay.

For all forms of phosphorous, it is desirable to determine the concentration of soluble reactive phosphorous as this form of phosphorous is most immediately available to aquatic macrophytes and algae. Phosphorous is usually the limiting nutrient in "inland freshwaters" and gives an indication of the likelihood of euthrophication within a water environment. There are a number of guidelines on concentration that should occur to protect the overall health of the water body. Some sources of phosphorous to water bodies are directly regulated by legislation such as emissions from wastewater treatment works (Urban Wastewater Treatment Directive)

Within Torbay there are nineteen beaches and coves spread along the 35km of coastline that currently have public access. Fifteen of these locations are designated as bathing waters under the European Union Bathing Water Directive. The Bathing Water Directive provides quality guidelines for bathing waters at designated beaches including maximum levels of pollutants. The Environment Agency monitors the water quality at these locations and the water quality at each location is graded against a set of criteria to determine whether the waters are higher, minimum, or fail. In the past five years, the water quality at the designated bathing waters has either been higher or minimum. Table 4.4 presents the last six years of water quality at the designated bathing waters within Torbay.

Table 4.4

Bathing Water Quality Results 2006 – 2010 based on Bathing Water Directive

Bathing Water	2011	2010	2009	2008	2007	2006
Maidencombe	Higher	Higher	Higher	Higher	Minimum	Higher
Watcombe	Minimum	Higher	Minimum	Higher	Higher	Higher
Oddicombe	Higher	Higher	Higher	Higher	Higher	Higher
Babbacombe	Higher	Higher	Higher	Higher	Higher	Higher
Ansteys Cove	Higher	Higher	Higher	Higher	Higher	Higher
Meadfoot	Higher	Higher	Higher	Higher	Higher	Higher
Beacon Cove	Higher	Higher	Minimum	Higher	Higher	Higher
Torre Abbey	Minimum	Minimum	Higher	Minimum	Minimum	Minimum
Hollicombe	Higher	Minimum	Minimum	Higher	Minimum	Minimum
Preston	Higher	Higher	Minimum	Higher	Higher	Minimum
Paignton	Higher	Higher	Minimum	Minimum	Higher	Minimum
Goodrington	Minimum	Minimum	Minimum	Minimum	Higher	Higher
Broadsands	Higher	Higher	Higher	Higher	Higher	Higher
Brixham Breakwater	Higher	Higher	Higher	Higher	Higher	Higher
Brixham St Marys Bay	Higher	Higher	Higher	Higher	Higher	Higher

Classification

Where:

Higher = bathing water meets stricter UK guideline standards.

Minimum = bathing water meets mandatory bathing water directive standards.

Fail = bathing water fails to meet mandatory bathing water directive standards.

Not sampled = bathing water closed during bathing season

4.6 Ecology and Biodiversity

Torbay contains a significant number of valuable habitats and wildlife sites across the study area. More than 50% of rural land in Torbay is covered by an environmental or landscape designation. The headland at Berry Head in Brixham has been designated as a Special Area of Conservation (SAC) within the South Hams SAC and has European nature conservation importance for its greater horseshoe bat interest. Other important designations in Torbay include the South Devon Area of Outstanding Natural Beauty, the National Nature Reserve (NNR) at Berry Head, and numerous Sites of Special Scientific Interest (SSSI) and County Wildlife Sites.

In 2007 the English Riviera received international recognition for its rich geological, historical and cultural heritage, and was given the UNESCO endorsed status of Geopark to become the English Riviera Global Geopark. The Geopark provides a tool for promoting the area's geology and natural resources and supporting the sustainable economic development of the area, especially through tourism.

Torbay is fortunate to have a high concentration of designated environmental areas close to urban conurbations. This biodiversity enriches the Bay and offers many benefits, including flood risk reduction, recreational opportunities, health improvements and community cohesion. However, there are increasing pressures on this valuable resource. Climate change, habitat loss and fragmentation are the greatest threats to the Bay's natural environment and to protect it for the future we need to plan and act now. The legal status of designated areas and protected species help to ensure these assets are protected. However, to allow Torbay's wildlife to move and adapt to more favourable habitats as the climate changes, conservation efforts need to operate on a landscape scale as well as on a protected site basis and ensure there is connectivity between sites across the Bay. Habitat restoration and conservation work need to remain a priority at key wildlife areas. The strategic wildlife network linking the key sites needs to be strengthened, with targeted action to create a natural landscape that is more resilient to future climate change. The actions set out in the Torbay green Infrastructure Delivery Plan provide an important context for these aspirations.

The existing biodiversity and landscape assets in Torbay include:

- The South Hams Special Area of Conservation (SAC), which includes Berry Head SAC, designated for the limestone grassland, greater horseshoe bat roost and sustenance zone and protected under European law.
- A Marine Special Area of Conservation (SAC) for sea caves and reefs.
- Internationally important limestone grasslands.
- 12 Sites of Special Scientific Interest (SSSI) for biodiversity and geological conservation.
- Torbay is home to 3% of the UK population of the rare Cirl Bunting.

5.0 Outcomes, Constraints and Recommendations

5.1 Water Resources and Supply

There are both surface water and groundwater sources utilised within and outside the Torbay area for public water supply. Within Torbay, the Environment Agency's CAMS process has identified that there is water available in a number of sub catchments but these would be subjected to conditions were they to be considered for public water supply. However in catchments where existing public water supply abstractions are located these are indicated as being either over licensed or over abstracted and therefore further water resources from these sources are unlikely to be available.

Water supplied to Torbay is part of the wider Roadford Strategic Supply Area operated by South West Water on the Devon/Cornwall border. This is the largest reservoir in Devon with a capacity, at full, of 35,000 megalitres, and though currently operating at 65% below full capacity, is still capable of meeting demands in the strategic supply area in peak summer months.

The South West Water final water resource plan identifies that there are sufficient water resources to supply demand from existing housing and non domestic uses. The final water resource plan also identifies for the period of the plan that there is no supply and demand deficit and therefore supply will be maintained during dry years and there are no proposals to change the existing level of service to customers. In calculating future demand forecasts, climate change has been taken into account alongside a safety margin for assessing headroom uncertainty.

The final water resource plan indicates that demand across the region is likely to fall until about 2016/17 through the increased uptake of customers opting for water metering, the impact of water efficiency measures, new water tariffs and a projected reduction in commercial demand. However, post 2017, demand is likely to rise again and is linked to population growth. A surplus of supply over demand plus headroom will be maintained through until 2034/35 as a result of demand management measures and investment within water supply infrastructure.

Based on the information contained within the final water resources plan, there is sufficient headroom within the Roadford strategic supply area accounting for forecast demand (and not including water efficiency options) over the South West Water planning period which is commensurate with the planning timeframes of Torbay. Therefore, there is unlikely to be a significant requirement for water infrastructure for supply purposes at a strategic level. This is also mirrored in the South West Water strategic business plan that does not identify significant infrastructure requirements planned for the period 2010 to 2015 within the Torbay area.

In summary, there are no immediate issues in relation to future development and water resource supply. However, water supply infrastructure issues should be investigated in more detail to ensure that the treated water can be transferred to the areas of growth. It should also be confirmed that there are no pressure or capacity issues in the strategic water supply infrastructure that would affect future growth and identify where local reinforcements may be required to facilitate future growth beyond 2015, therefore linking in with the Asset Management Plan 6 cycle.

5.2 Flood Risk and Surface Water Management

5.2.1 Flood Risk

The Torbay Council Level 1 Strategic Flood Risk Assessment (published October 2008) has been produced in accordance with Planning Policy Statement 25 and its associated practice guidance, incorporating new climate change allowances and new water levels. In addition the Torbay Council Level 2 Strategic Flood Risk Assessment (published in December 2010) has been produced for the most significant flood risk areas within Torbay. These documents provide information on the flood risk from fluvial, tidal, surface, ground, sewer and artificial water sources to aid Torbay Council in the application of the sequential test to inform the sustainability appraisal and subsequent planning policies. It is noted that the areas susceptible to surface water flooding maps have been provided by the Environment Agency and these are available to use to inform strategic planning, therefore these should be used to identify flood risk areas.

The above information should be used when considering proposed site allocations in order to ensure that:

- The risk of flooding to the potential development areas is quantified and the development is steered away from high risk areas (Flood Zones 2 and 3) and areas susceptible to surface water flooding;
- Any flood mitigation measures are planned in a strategic manner; and
- There is no deterioration to existing communities standard of protection.

The aim of identifying the potential sources of flood risk to the potential development areas is to assess the risks of all forms of flooding to and from a development in order to identify any potential development constraints with respect to flood risk.

Within the Level 1 Strategic Flood Risk Assessment a number of strategies for managing flood risk within Torbay have been identified. These strategies must be considered for all proposed developments and are as follows:

- **Making Space for Water** – At the planning application stage, an appropriate flood risk assessment will be required to demonstrate how flood risk from all sources of flooding to the development and to other locations will be managed now and taking climate change into account. As part of this strategy the developer is encouraged to deal with excessive flood risk by allowing areas of development such as open space to flood. The developer should also utilise other areas of the development such as highways to act as carriers of floodwater. When designing flood storage and carriers of this nature the developer must ensure that there is no risk of flooding to properties or that the flooding is not to a depth that will result in a risk to the public.
- **Managing Surface Water** – The effective disposal of surface water from the development is a material planning consideration in determining proposals for the development and use of land. It will always be much more effective to manage surface water flooding at and from new developments early in land acquisitions and design process rather than resolve problems after development. Site layout should be influenced by

topography. The location of buildings where surface water may flow naturally, or as a result of development, under extreme circumstances must be avoided if possible. Surface water arising from a development site should as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

- **Sustainable Drainage** – Torbay Council promotes the use of SuDS for the management of surface water run-off. The surface water drainage arrangements for any development site should be such that the volume and peak flow rates of surface water leaving a development site are no greater than the rates prior to the proposed development, unless specific off-site arrangements are made and result in the same effect. Site layout and surface water drainage systems should cope with events that exceed the design capacity of the system; the excess water can be safely stored on or conveyed from the site without adverse impacts.
- **Climate Change** – There is an increasing body of scientific evidence that global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant global climate change during the century. The nature of climate change at a regional level will vary however for the UK projections indicate that more frequent short duration high intensity rainfall and more frequent periods of long duration rainfall will be expected together with sea level rise. These kind of changes will have implications for river and watercourse flooding together with local flash flooding. In order to assist with the assessment of vulnerability to climate change the Government established the UK Climate Impact Programme (UKCIP). Scenarios of future climate change in the UK are produced by UKCIP and these must be used in the assessment of flood risk.
- **Improving Habitat for Wildlife** – As part of the detailed design for flood alleviation measures the developer should consider whether it is possible to improve the habitat for wildlife by using buffer strips or wildlife corridors. This would be implemented where considering the use of filter strips, swales or basins and ponds.
- **Consider Egress/Ingress to Buildings** – As part of the flood risk assessment the developer must demonstrate that the finished floor level of buildings is above the 1 in 100 year flood level. In addition the developer must demonstrate that during a flood event the egress and ingress for pedestrians to the property will not be adversely affected.
- **Opening Culverts** – Where an existing main river, watercourse or ditch has been culverted and crosses a development site the developer should investigate the possibility of opening the culvert pipes (i.e. removing the culvert and returning the main river, watercourse or ditch to its open condition). Prior to carrying out this work the developer must demonstrate that the design of the naturalisation will not result in an increased risk of flooding to the site and elsewhere.

In addition to the above strategies within the Level 2 Strategic Flood Risk Assessment a number of Policy Recommendations have been identified. The South Devon Catchment Flood Management Plan provides a summary of the flood risk

management policies that have been set out by the Environment Agency. The policy recommendations contained within the Torbay Level 2 Strategic Flood Risk Assessment comply with these aspirations and if integrated will help to strengthen the position of Torbay Council. The policy recommendations are as follows:

- The Environment Agency set out the framework under which an applicant or the Council can decide whether a Flood Risk Assessment is required in support of an individual planning application. This should be used to guide all development applications and is held online at: http://www.environment-agency.gov.uk/research/planning/33698.aspx
- If development is to be constructed with less vulnerable uses on the ground level, agreements need to be in place to prevent future alterations of these areas to more vulnerable uses without further study into flood risk.
- Single storey residential developments should not be considered in flood risk areas as they offer no opportunity for safe refuge areas on upper floors.
- Where a development is applying for a change of use, flood evacuation plans should be developed through liaison with the emergency services. This accounts for changes from lower to higher vulnerability classes and should be delivered as part of the site specific flood risk assessment.
- The Council should ensure new development in an area known to suffer stormwater flooding does not increase the discharge to the existing drainage system either through restricting site discharge rates and/or through capital contributions to improvement works of the existing drainage infrastructure.
- The Council ensures that proposed developments can be accommodated by the existing drainage infrastructure provision. Where a development cannot be met by current resources, ensure that the phasing of the development is in tandem with infrastructure investment.
- The Strategic Flood Risk Assessment process has highlighted the importance of flood defences throughout the Torbay Council area. Future policy should seek to address how these defences are to be maintained to ensure the current high level of protection.
- Review the condition of the existing local defences, the dependence of additional local development on them for flood mitigation and where necessary the Council should seek to maintain and or improve defences if necessary.
- Where necessary and achievable, and through liaison with the Environment Agency, adopt a policy for routine maintenance of all main rivers and watercourses ensuring that they are clear of debris that could affect flood flow conveyance.
- Where possible, mitigate flood risk from developments through development of flood storage schemes which also provide amenity benefit.
- Within flood risk assessments, groundwater flooding should be investigated in detail and the Council should ensure that new developments in known groundwater flood risk areas undertake a site investigation to determine the risks of groundwater flooding and incorporate mitigation measures into the design of any buildings to prevent flood damage from this source.

- Within flood risk assessments surface water flooding should be investigated in detail, and comprehensive surface water run-off calculations undertaken.
- Require all flood risk assessments and sustainable drainage design to consider the impacts of climate change for the lifetime of the development at the site and downstream.
- Ensure discharge rates from new developments do not increase following redevelopment, including an allowance for climate change and preferably restrict discharge rates to Greenfield run-off rates in areas known to have a history of sewer flooding.
- Consider the potential benefits an appropriately designed sustainable drainage system could have on the biodiversity, amenity value, water quality and resource value of a development and/or surrounding area.
- Consider the vulnerability and importance of local ecological resources when determining the suitability of drainage strategies/sustainable drainage systems.

5.2.2 Surface Water Management

Surface water management is a key consideration when assessing development within large areas. Planning Policy Statement 25 requires that new development does not increase the risk of flooding elsewhere by managing surface water run-off generated as a result of development. Altering large areas of land by urbanising it fundamentally alters the way in which rainfall drains to a watercourse and has the potential to increase the rate and amount of water that enters watercourses causing an increase in flood risk. In many cases, the management of surface water is achieved via a requirement to restrict run-off from developed sites to that which occurs from the pre-development site usage and this is achieved by incorporating a range of sustainable drainage systems (SuDS) which aim to maximise the amount of rainwater which is returned to the ground (infiltration) and then to hold back (attenuate) excess surface water. Incorporating SuDS often requires a large amount of space and for large developments often requires the consideration of large scale strategic features such as balancing ponds which can attenuate and store large volumes of water generated during very heavy rainfall to prevent flood risk downstream.

The management of surface water has the potential to act as a constraint to development within Torbay, not just because of space requirements, but because the reduction in run-off rates and volumes is likely to be onerous. In some areas, this is because discharge of surface water to tidal rivers can be restricted during tide locked conditions, where the water level at high tides prevents surface water drains from discharging. With expected increases in tidal waterlevels as a result of climate change, there is likely to be an increase in the length of time during which surface water discharges are tide locked. Additionally, smaller watercourses, ditches and drains within the district may not have additional capacity to accept surface water run-off and will require attenuation of surface water generated by new development.

New housing can increase the risk of diffuse pollution getting into surface water sewers. The pollution can come from a range of sources, such as waste water from houses or industry that should be connected to the foul drain, or oil and sediment collected on hard surfaces that are washed into these drains during rainfall. SuDS should be used whenever possible to mitigate the impact of this type of diffuse

pollution. Surface Water Management Plans are encouraged in the PPS25 practice guide companion and these plans should focus on managing flood risk, making efficient use of SuDS and safeguarding existing features of the water environment.

Torbay Council promotes the use of SuDS for the management of surface water run-off. All SuDS schemes should be designed in accordance with 'The SuDS Manual' CIRIA C687 and Building Regulation Part H on sustainable rainwater drainage which gives priority to the use of infiltration drainage systems over first watercourses and then sewers.

Site layout and surface water drainage systems should be able to cope with events that exceed the design capacity of the system; the excess water can be safely stored on or conveyed from site without adverse impacts. The surface water drainage arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a development site are no greater than the rates prior to proposed development, unless specific off-site arrangements are made and result in the same net effect.

For new developments it may be necessary to provide surface water storage and infiltration to limit and reduce both the peak rate of discharge from the site and the total volume discharged from the site. There may be circumstances where it is appropriate for infiltration attenuation storage to be provided outside the development site, if necessary through the use of Section 106 agreement.

5.3 Waste Water Treatment and Collection

The principal waste water treatment works for Torbay is located at Brokenbury which discharges treated effluent through a long sea outfall off Sharkham Point in Brixham. The majority of the proposed future development for Torbay is likely to be served by Brokenbury waste water treatment works and therefore confirmation that adequate volumetric and process capacity to accommodate proposed development has been sought from South West Water. South West Water have indicated that this facility is close to its design capacity, however much of the flow is due to surface water connections to the combined sewer system. Therefore by removing surface water connections and redirecting surface water flows to SuDS additional foul capacity can be made available for future development.

The Edginswell area of Torquay, including the potential new developments at Scott's Bridge and the Willows, are the only parts of the Bay that do not drain to Brokenbury. This area drains to the Aller Valley trunk sewer which flows into Newton Abbot before discharging to Buckland waste water treatment works. The proposed future development in the Edginswell area of Torbay together with the future development proposed by Teignbridge Council in Newton Abbot, Kingsteignton and Teignmouth will result in Buckland waste water treatment works requiring upgrading in the near future.

The existing sewer network, subject to the continued removal of surface water from the system, is generally of a capacity and condition to meet existing and future demands for foul flows. However there is currently a planning application for 350 dwellings, 38,000m^2 of gross employment floor space and associated retail development at White Rock in the western side of Paignton. Other development sites at Totnes Road and Great Parks have also been identified in this area of Paignton and South West Water have indicated that if all these developments proceed it is likely

that a new tunnel sewer will be required to serve these developments in order to transfer flows to Brokenbury waste water treatment works.

As mentioned earlier, the majority of the Torbay sewer network is comprised of combined sewers and therefore opportunities should be sought to separate surface water and foul water, where feasible, within existing developments in order to increase capacity within the existing combined sewer system. In addition, all new developments should be constructed with separate foul and surface water systems and SuDS should be used to provide wider benefits to the community through improved amenity and water quality. This will also help to provide capacity within the system to cater for the effects of climate change and reduce environmental issues associated with combined sewer overflow operation and flooding from the combined sewer network.

As the proposed location and programming of future development is finalised South West Water will be required to assess in more detail the waste water baseline and capacity of the existing waste water treatment works and network infrastructure in order to confirm:

- The baseline with respect to treatment of waste water and how much spare capacity is available in existing waste water treatment facilities.
- The baseline with respect to waste water or sewer network and whether there is scope to use the existing network system (these include pipes and pumping stations) before upgrades are required.
- The phasing requirements for development to ensure that any planned growth is commensurate with planned upgrades to the existing network/facilities.
- The potential for removing surface water from combined sewers, this will release headroom within the system for foul water.

5.4 Water Quality

The assessment of water quality, based on information provided by the Environment Agency, indicates that the majority of the monitored rivers within Torbay are classified as either good or moderate in terms of their ecological status. There is a risk that water quality classification may be reduced in the future as a result of surface water run-off from new developments. The use of sustainable drainage systems should therefore be utilised where possible to help treat surface water prior to discharge.

Wetlands, in particular reedbeds, can also act as natural sewage treatment, which reduces the amount of pollution in our river systems and help to improve water quality on our beaches. The Water Framework Directive is now the umbrella directive for water quality improvements and for assessing aquatic ecosystems. The aim of the Water Framework Directive is to achieve good ecological status in all water bodies. The use of SuDS on new developments is just one of the ways that improvements to the ecological status of water bodies can be delivered.

These measures will be driven by tighter standards under the Water Framework Directive which in turn are likely to tighten consent standards and look for reductions in diffuse sources entering the river system.

South West Water has invested significant resources into improving the bathing water quality as a result of the implementation of the Clean Sweep programme. A new waste water treatment works was constructed at Brokenbury, together with new pumping stations at Ilsham Valley in Torquay and Oxen Cove in Brixham, to transfer flows from Torquay and Brixham to the new treatment works. In addition to these schemes, works have been undertaken to provide additional storage within the sewer network to reduce the risk of flooding and reduce the spill frequency from combined sewer overflows to the bathing waters.

In summary, the following issues within Torbay in relation to future development and water quality will need to be addressed as the location and programme for these developments is agreed. This work should be undertaken in conjunction with South West Water and the Environment Agency, particularly with respect to consenting requirements under both the existing and future Water Framework Directive water quality standards:

- Future development may impact on the existing water quality as a result of surface water run-off. The use of SuDS will provide multiple benefits including water quality and flood risk reduction (surface water, tide locking, sewer flooding).
- Bathing water quality should not be impacted by future development. Discharge consent limits and waste water treatment capacity to achieve required standards should be assessed to identify where constraints may exist to future development.
- Following the production of detailed site locations and programme for future development, South West Water should be consulted to identify where investment may be required to ensure no deterioration in water quality standards.

5.5 Ecology and Biodiversity

Torbay contains a significant number of areas and sites of ecological importance, in particular the headland at Berry Head which is within the South Hams SAC together with a marine SAC. No increase in existing abstractions from surface water or groundwater sources has been identified and therefore it is possible to screen out impacts on sites within Torbay as a result of water resources.

Climate change predictions for Torbay indicate that summer rainfall is likely to reduce by up to 50% whilst winter rainfall could increase by up to 20%. However, individual storm events are forecast to become more frequent and intense resulting in an increased risk of flooding. In addition the climate change predictions indicate that sea levels could rise by 900mm over the next 100 years resulting in an increased risk of flooding to the coastal areas of Torbay.

In order to help reduce the impacts of climate change the principles and practice of green infrastructure should be embraced by all future developments in appropriate locations. These can help reduce the impact of flooding by creating natural sea defences, and reducing surface water run-off. By planting and restoring wetlands and greening the Bay with trees, parks and gardens, sustainable soakaways and natural water storage are created, at the same time providing greenspace for wildlife and people. Proposed wetland creation and enhancement will not only provide flood alleviation and bathing water quality improvements but will also provide places for people to enjoy the natural environment and help to improve connectivity and accessibility. Wetlands of this nature will also provide rich biodiversity habitats and

act as a stepping stone for birds between bigger areas of reedbeds outside of the Bay at Slapton Sands, the River Teign and Exminster Marshes.

As part of all future developments within Torbay the following issues must be addressed in detail:

- The risk of reduced water quality due to increased volumes of treated effluent being discharged into watercourses, main rivers and the sea as a result of proposed new development.
- The risk of reduced water quality due to the increased frequency of operation and volumes of untreated sewage effluent being discharged from combined sewer overflows into watercourses, main rivers and the sea as a result of proposed new development.
- Poorly managed urban run-off from proposed new development areas could impact upon ecological sites within Torbay, hence, strategic level SuDs will need to be planned in order to ensure that this impact is minimised.
- As part of future developments, developers must be encouraged to address the benefits of green infrastructure provision, to enhance, restore and create habitats for wildlife and to protect and improve the landscape of Torbay.

6.0 References

Draft Regional Spatial Strategy for the South West of England (2006): Available from http://www.gosw.gov.uk/gosw/planninghome/691545/601679/

Draft Revised Regional Spatial Strategy for the South West of England Incorporating the Secretary of State's Proposed Changes (2008)

Planning Policy Statement 3: Housing (PPS3) (2006) – Communities and Local Government

Planning Policy Statement 25: Development and Flood Risk (PPS25) (2010) – Communities and Local Government

Planning Policy Statement 25: Development and Flood Risk: Practice Guide (2008) – Communities and Local Government

Torbay Core Strategy: Regulation Z5 Consultation Vision, 'Objectives and Options for Growth in Torbay' – September 2009

Water Framework Directive (200/60/EC)

European Habitats Directive (92/44/EEC)

Urban Waste Water Treatment Directive (91/271/EEC

Torbay Council Level 1 Strategic Flood Risk Assessment – October 2008

Torbay Council Level 2 Strategic Flood Risk Assessment – December 2010

Water Cycle Study Manual – Environment Agency June 2009

Water Resource Strategy for England and Wales – Environment Agency March 2010

South West Water – Water Resource Management Plan 2010 – 2035 – November 2009

Teign, Torbay and South Hams Catchment Abstraction Management Strategy – Environment Agency 2007

South Devon Catchment Flood Management Plan – Environment Agency 2009

The SuDS Manual – CIRIA 2007 – Ref number C697

Torbay Green Infrastructure Delivery Plan – April 2011

Figures

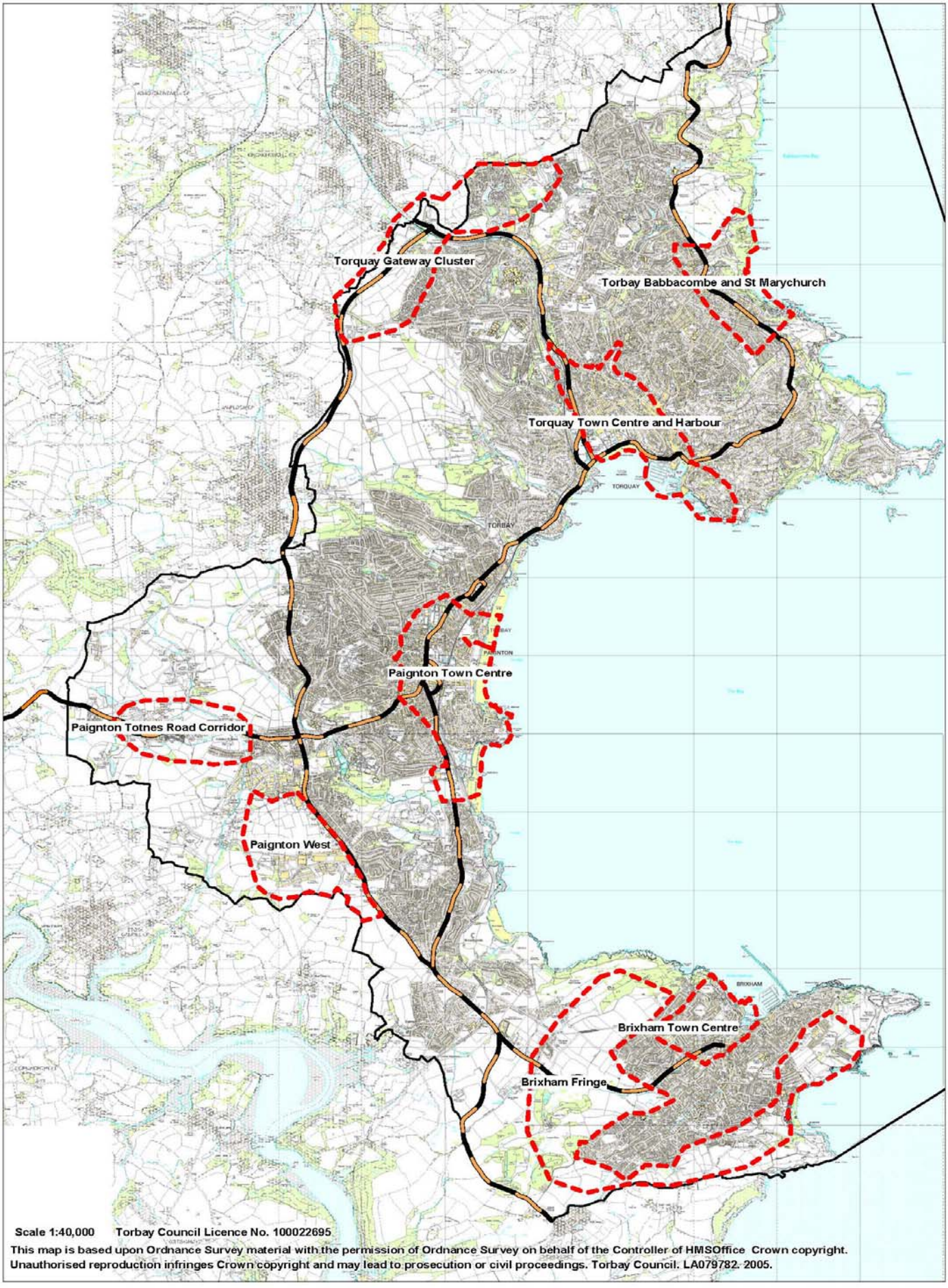

Figure 2 – Overview of Study Area

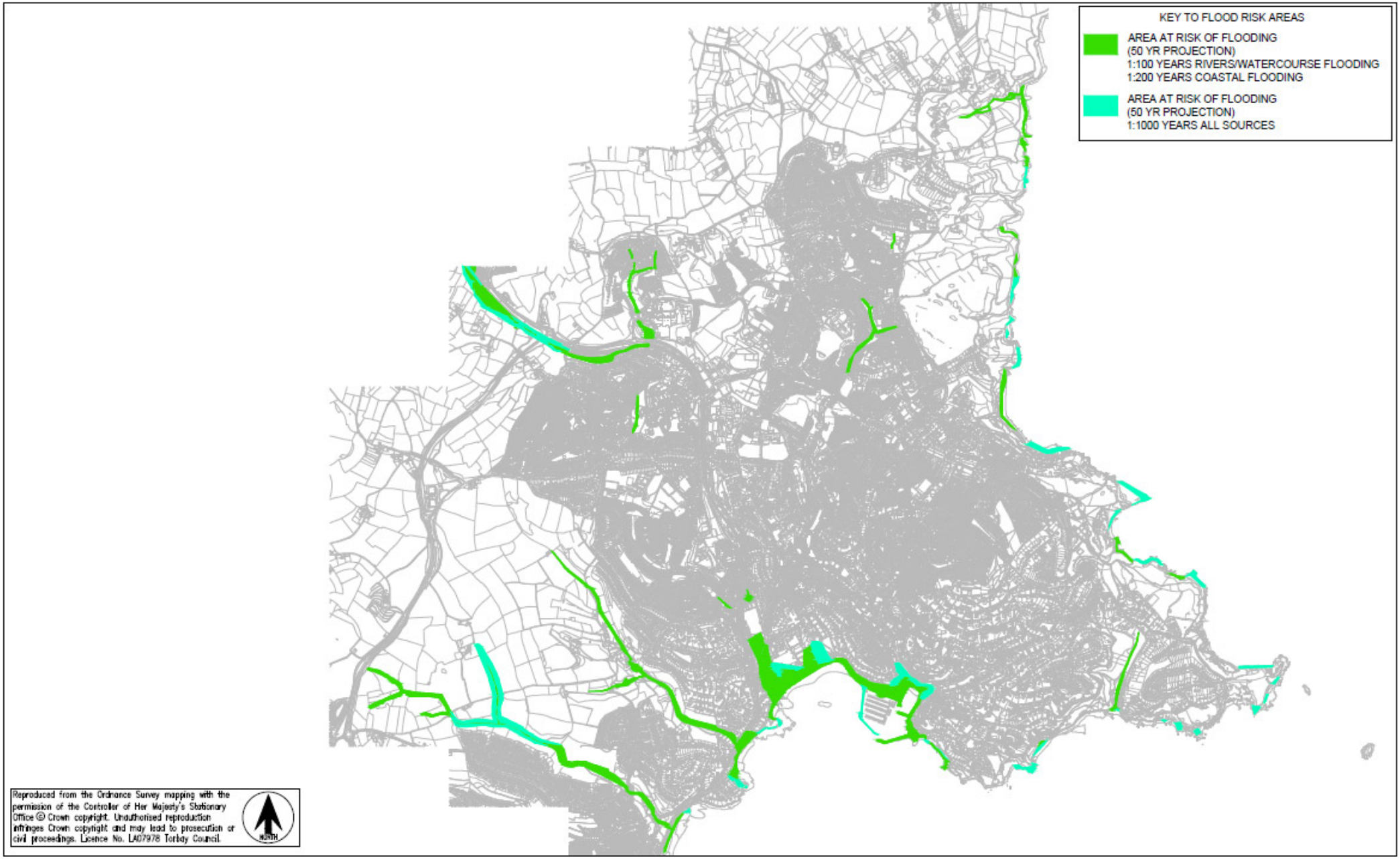

Figure 3 - Torquay Flood Risk Areas

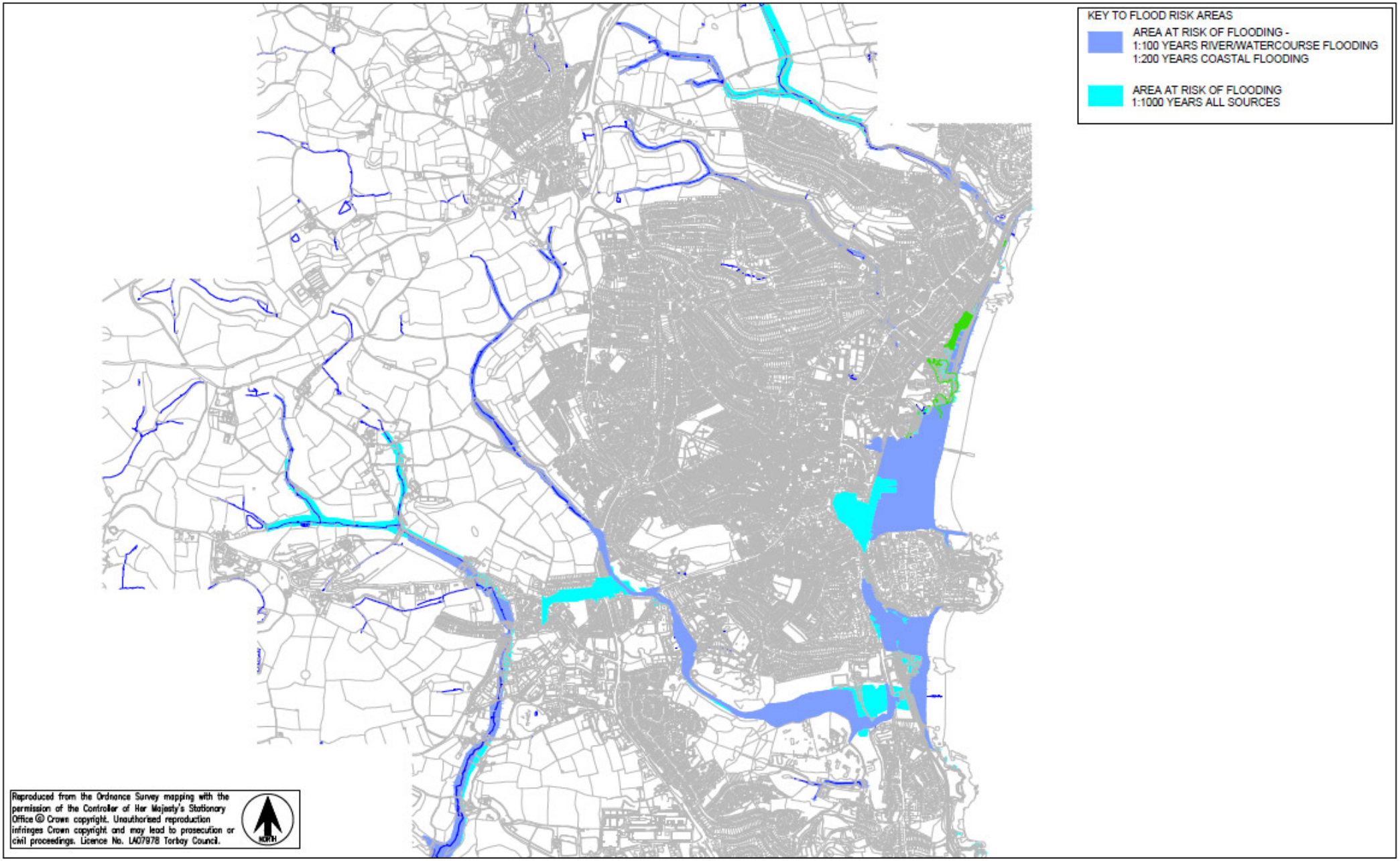

Figure 4 - Paignton Flood Risk Areas

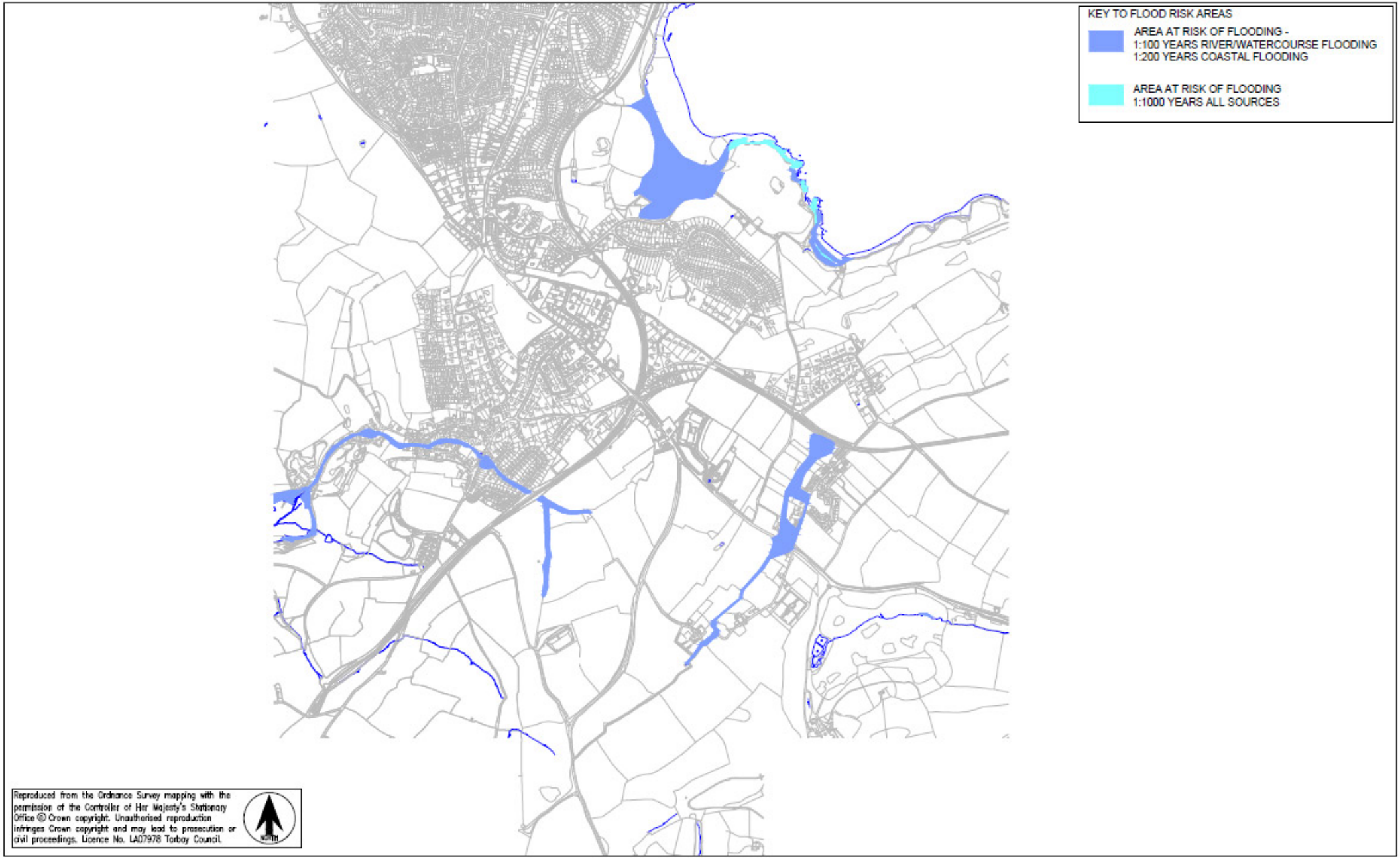

Figure 5 - Galmpton Flood Risk Areas

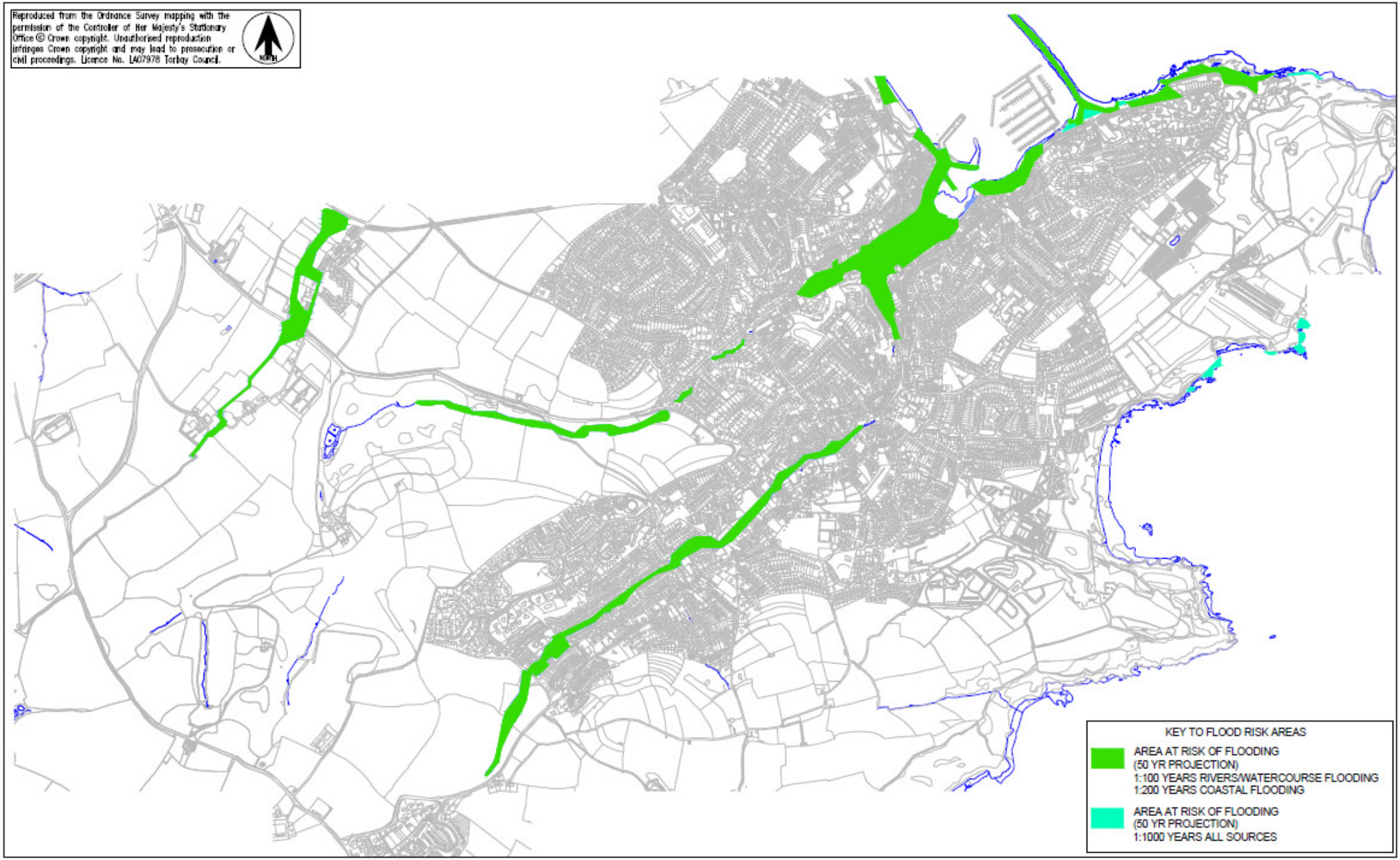

Figure 6 - Brixham and Churston Flood Risk Areas

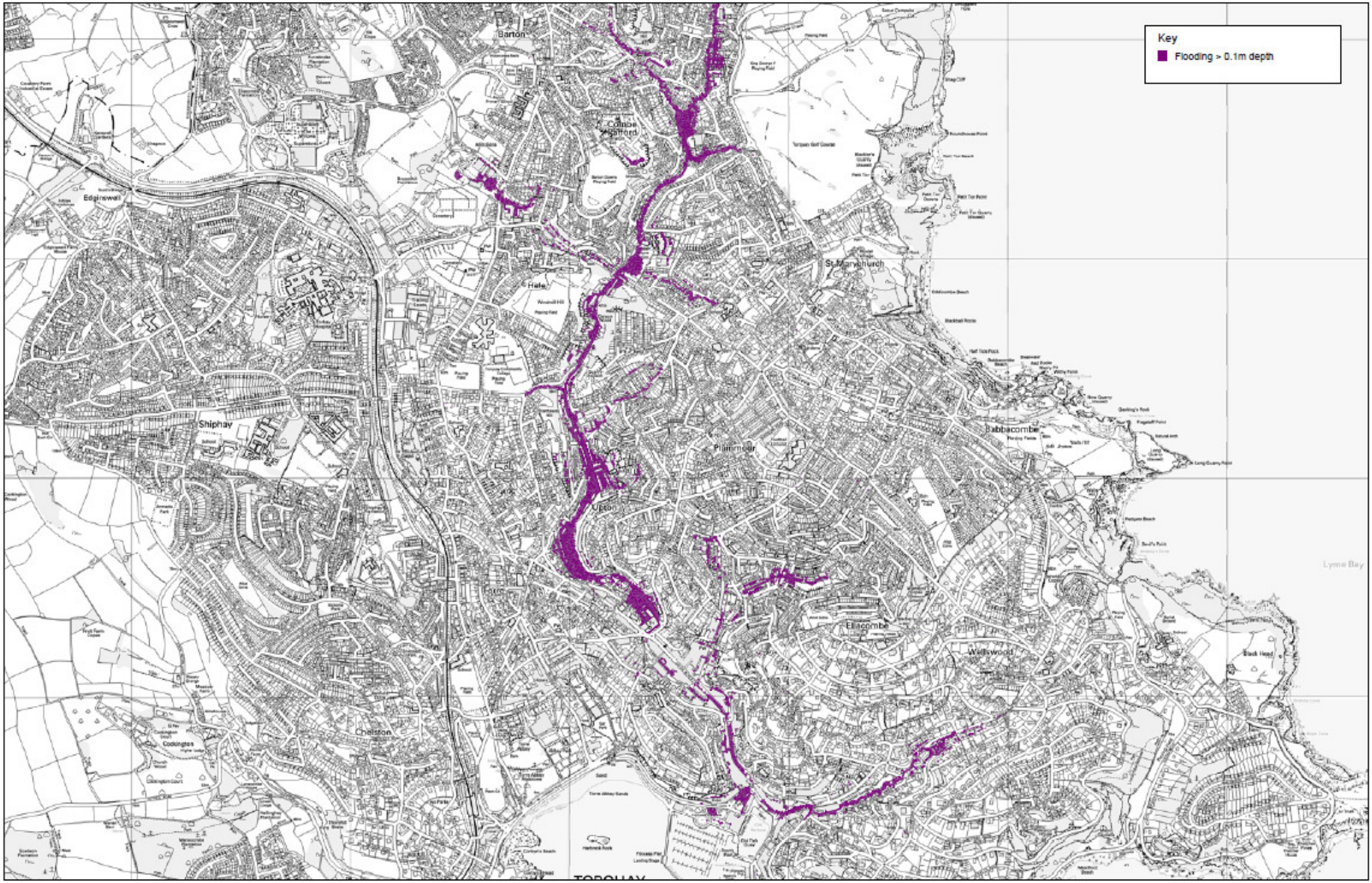

Figure 7 - Torquay Surface Water Flooding

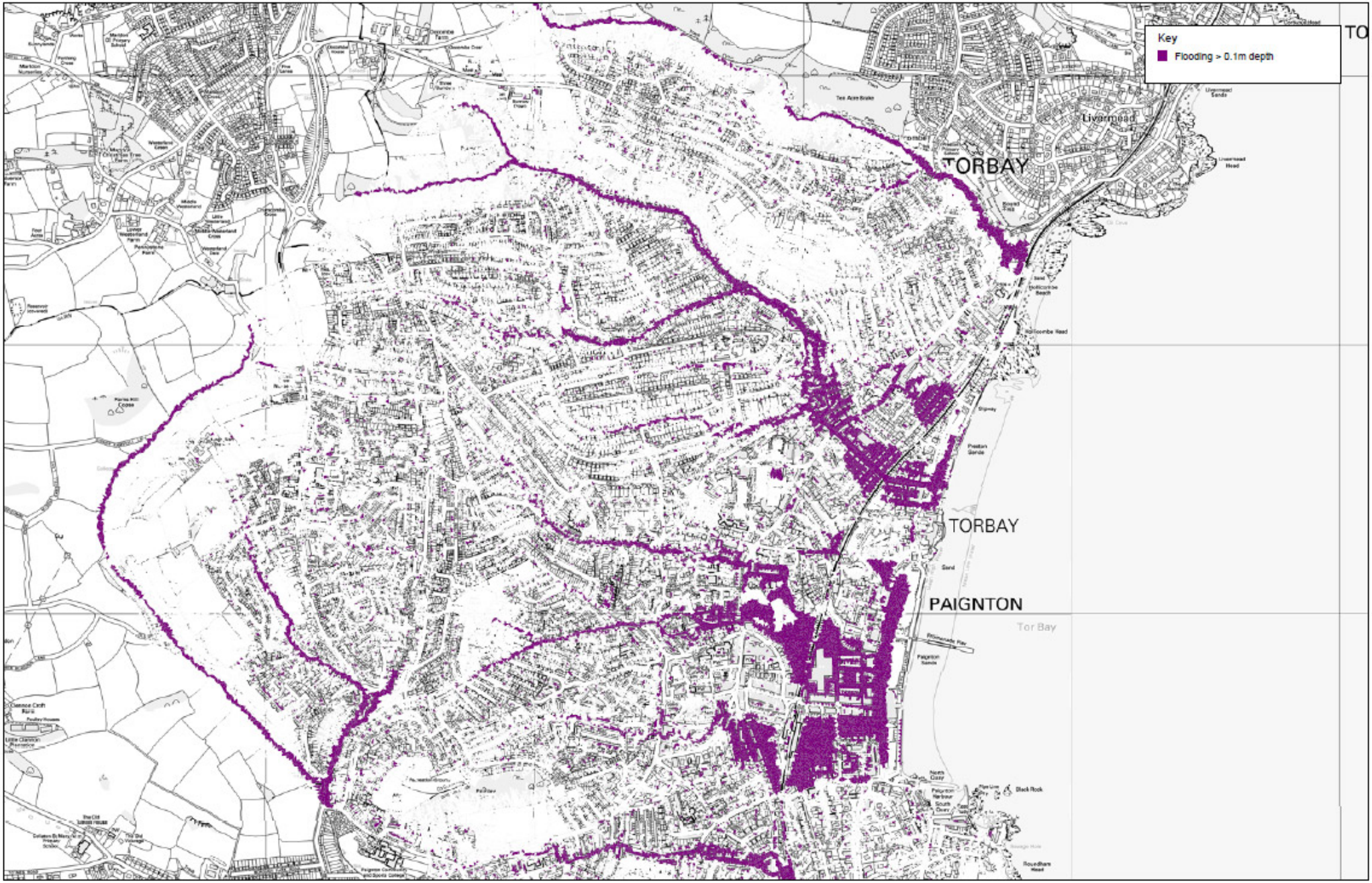

Figure 8 - Paignton Surface Water Flooding

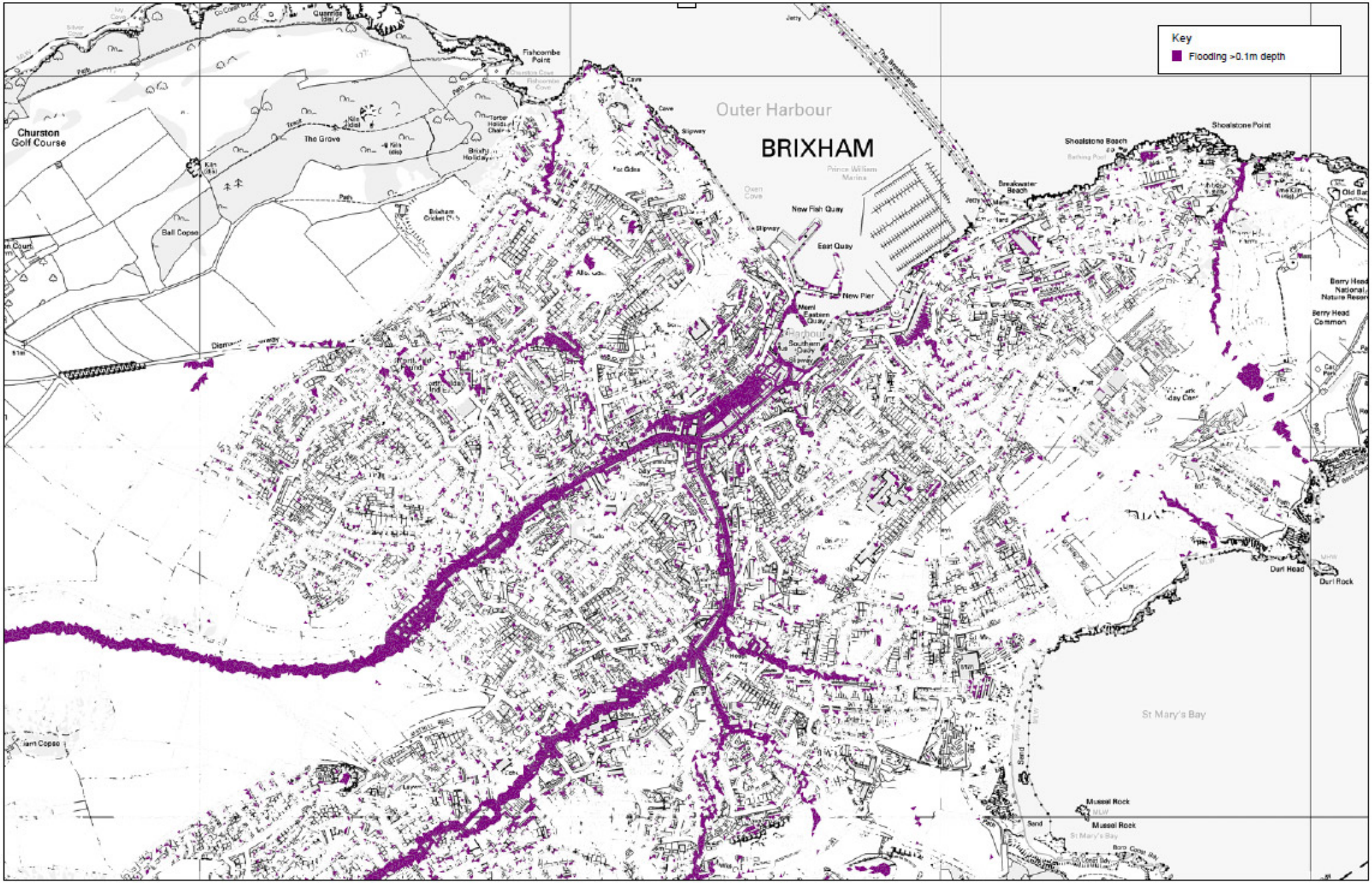

Figure 9 - Brixham Surface Water Flooding

Figure 10 - Clennon Valley Surface Water Flooding

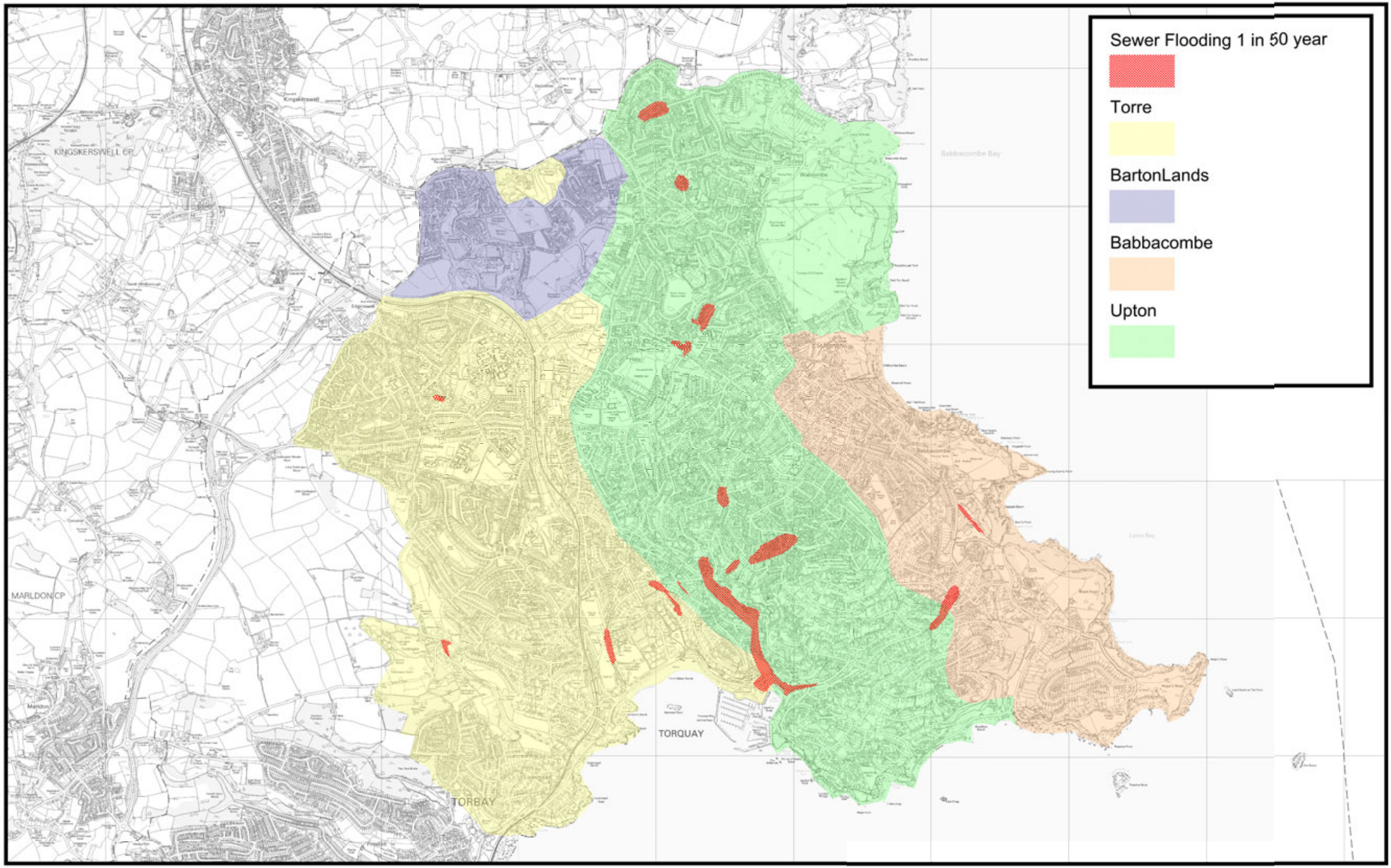

Figure 11 - Torquay Sewer Catchments Areas and Flood Risk Areas

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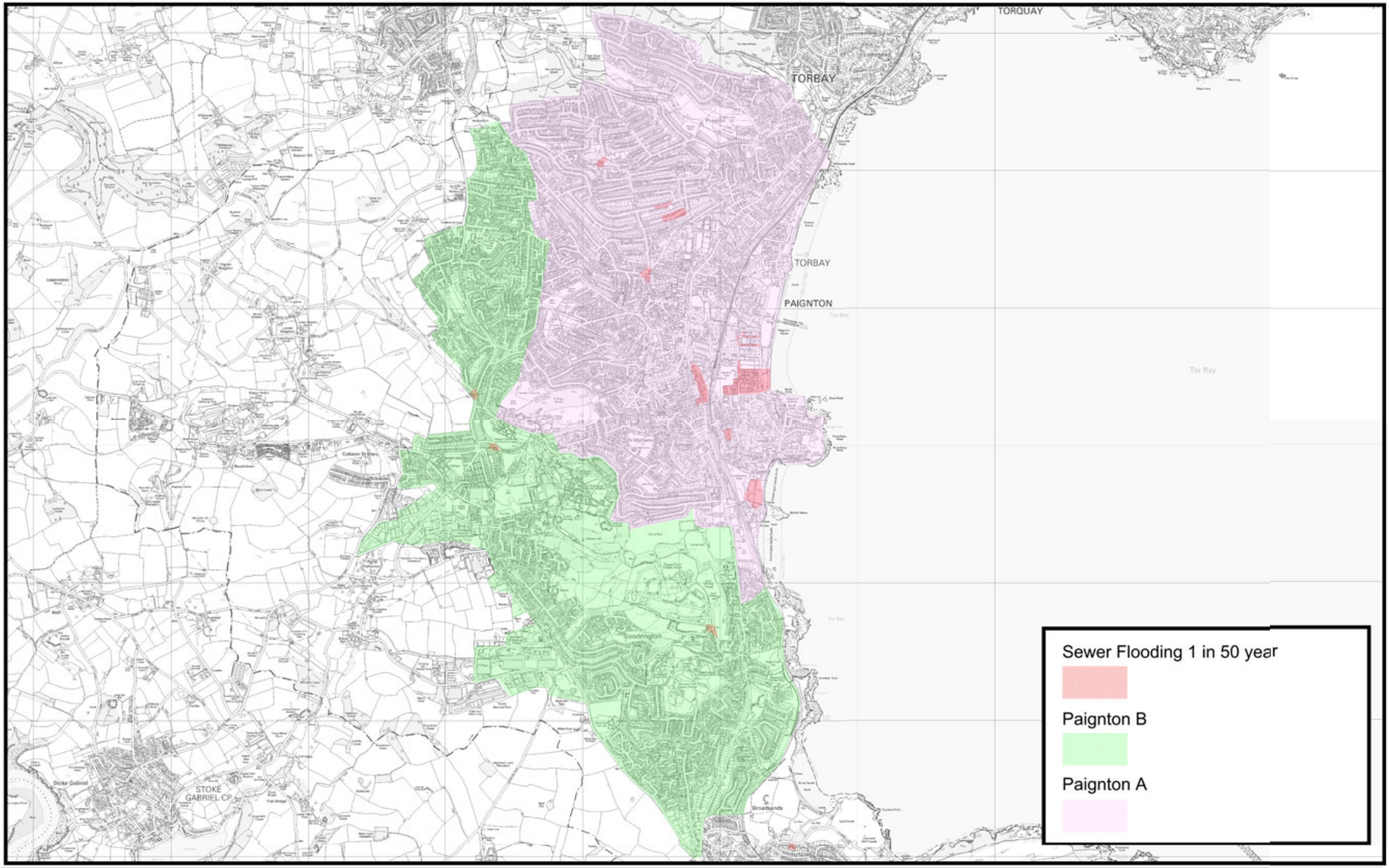

Figure 12 - Paignton Sewer C atchment Areas and Flood Risk Areas

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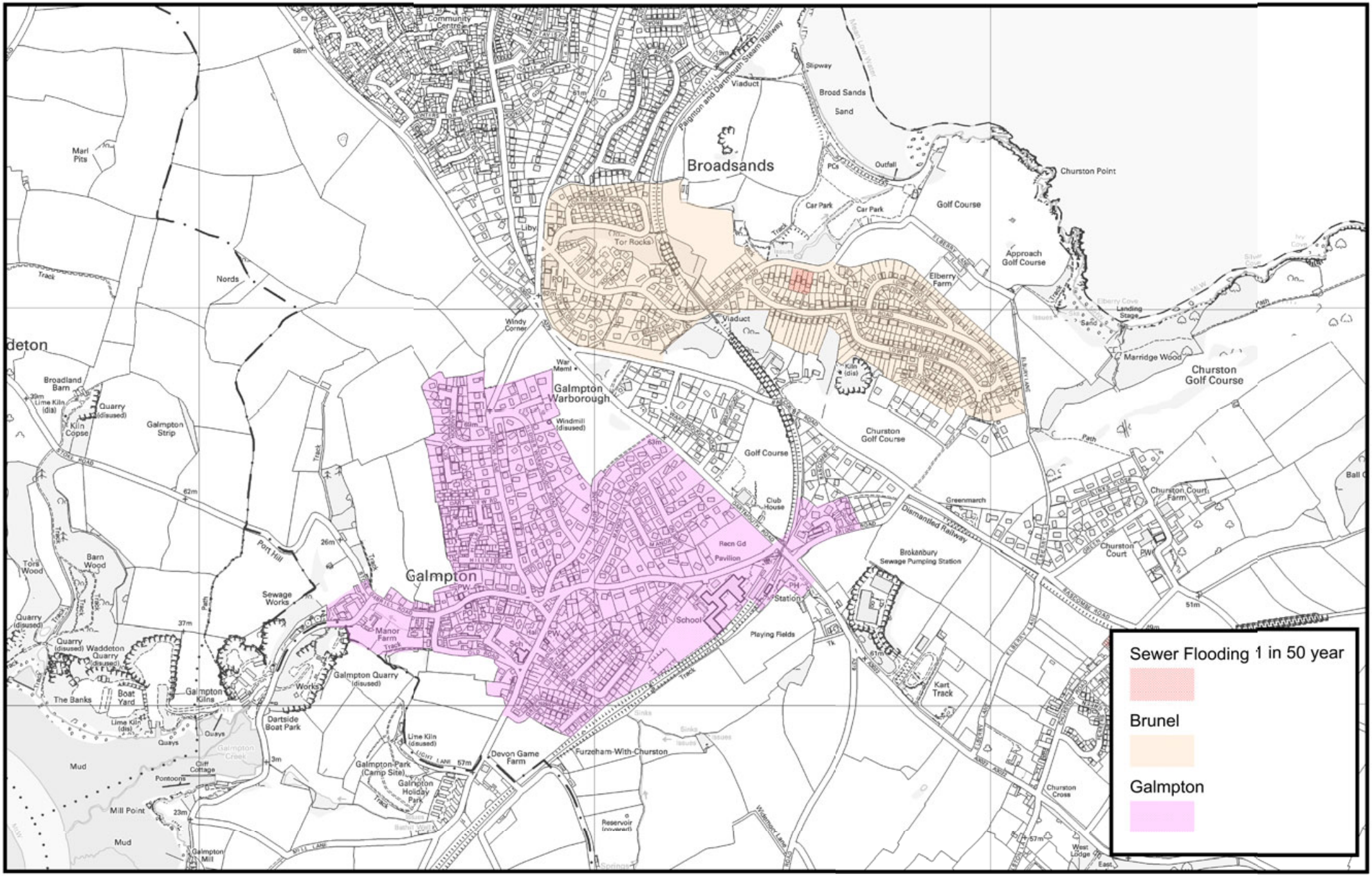

Figure 13 - Galmpton and Brunel Sewer Catchment Areas and Flood Risk Areas

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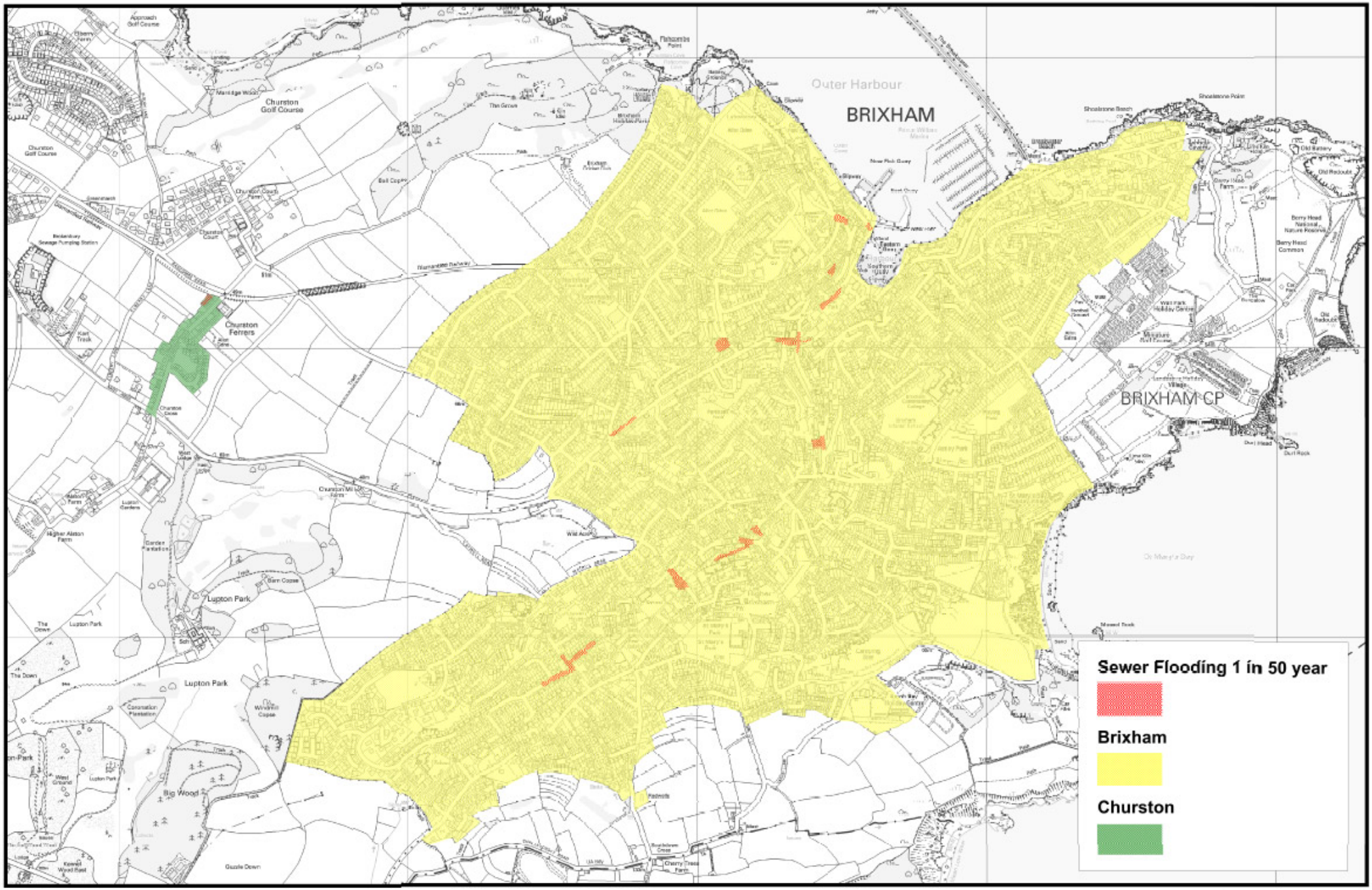

Figure 14 - Brixham and Churston Sewer Catchment Areas and Flood Risk Areas

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