Thurrock: A place of opportunity, enterprise and excellence, where individuals, communities and businesses flourish

Cabinet

The meeting will be held at **7.00 pm** on **13 January 2016**

Committee Rooms 2 & 3, Civic Offices, New Road, Grays, Essex, RM17 6SL.

Membership:

Councillors John Kent (Chair), Barbara Rice (Vice-Chair), Oliver Gerrish, Victoria Holloway, Bukky Okunade, Jane Pothecary, Gerard Rice, Richard Speight and Lynn Worrall

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Open to Public and Press

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Queries regarding this Agenda or notification of apologies:

Please contact Kenna-Victoria Martin, Senior Democratic Services Officer by sending an email to Direct.Democracy@thurrock.gov.uk

Agenda published on: **5 January 2016**

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DECLARING INTERESTS FLOWCHART – QUESTIONS TO ASK YOURSELF

Breaching those parts identified as a pecuniary interest is potentially a criminal offence

Helpful Reminders for Members

- *Is your register of interests up to date?*
- *In particular have you declared to the Monitoring Officer all disclosable pecuniary interests?*
- *Have you checked the register to ensure that they have been recorded correctly?*

When should you declare an interest *at a meeting?*

- **What matters are being discussed at the meeting?** (including Council, Cabinet, Committees, Subs, Joint Committees and Joint Subs); or
- If you are a Cabinet Member making decisions other than in Cabinet **what matter is before you for single member decision?**

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Does the business to be transacted at the meeting

- **relate to; or**
- **likely to affect**

any of your registered interests and in particular any of your Disclosable Pecuniary Interests?

Disclosable Pecuniary Interests shall include your interests or those of:

- your spouse or civil partner's
- a person you are living with as husband/ wife
- a person you are living with as if you were civil partners

where you are aware that this other person has the interest.

A detailed description of a disclosable pecuniary interest is included in the Members Code of Conduct at Chapter 7 of the Constitution. **Please seek advice from the Monitoring Officer about disclosable pecuniary interests.**

What is a Non-Pecuniary interest? – this is an interest which is not pecuniary (as defined) but is nonetheless so significant that a member of the public with knowledge of the relevant facts, would reasonably regard to be so significant that it would materially impact upon your judgement of the public interest.

Pecuniary

If the interest is not already in the register you must (unless the interest has been agreed by the Monitoring Officer to be sensitive) disclose the existence and nature of the interest to the meeting

If the Interest is not entered in the register and is not the subject of a pending notification you must within 28 days notify the Monitoring Officer of the interest for inclusion in the register

Unless you have received dispensation upon previous application from the Monitoring Officer, you must:

- **Not participate or participate further in any discussion of the matter at a meeting;**
- **Not participate in any vote or further vote taken at the meeting; and**
- **leave the room while the item is being considered/voted upon**

If you are a Cabinet Member you may make arrangements for the matter to be dealt with by a third person but take no further steps

Non- pecuniary

Declare the nature and extent of your interest including enough detail to allow a member of the public to understand its nature

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You may participate and vote in the usual way but you should seek advice on Predetermination and Bias from the Monitoring Officer.

Vision: Thurrock: A place of **opportunity**, **enterprise** and **excellence**, where **individuals**, **communities** and **businesses** flourish.

To achieve our vision, we have identified five strategic priorities:

1. Create a great place for learning and opportunity

- Ensure that every place of learning is rated “Good” or better
- Raise levels of aspiration and attainment so that residents can take advantage of local job opportunities
- Support families to give children the best possible start in life

2. Encourage and promote job creation and economic prosperity

- Promote Thurrock and encourage inward investment to enable and sustain growth
- Support business and develop the local skilled workforce they require
- Work with partners to secure improved infrastructure and built environment

3. Build pride, responsibility and respect

- Create welcoming, safe, and resilient communities which value fairness
- Work in partnership with communities to help them take responsibility for shaping their quality of life
- Empower residents through choice and independence to improve their health and well-being

4. Improve health and well-being

- Ensure people stay healthy longer, adding years to life and life to years
- Reduce inequalities in health and well-being and safeguard the most vulnerable people with timely intervention and care accessed closer to home
- Enhance quality of life through improved housing, employment and opportunity

5. Promote and protect our clean and green environment

- Enhance access to Thurrock's river frontage, cultural assets and leisure opportunities
- Promote Thurrock's natural environment and biodiversity
- Inspire high quality design and standards in our buildings and public space

Minutes of the Meeting of the Cabinet held on 9 December 2015 at 7.00 pm

The deadline for call-in is Friday 18 December 2015 at 5.00 pm

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Present:	Councillors John Kent (Chair), Barbara Rice (Vice-Chair), Oliver Gerrish, Victoria Holloway, Bukky Okunade, Jane Pothecary, Gerard Rice, Richard Speight and Lynn Worrall
In attendance:	Steve Cox, Assistant Chief Executive Carmel Littleton, Director of Children's Services Roger Harris, Director of Adults, Health and Commissioning Sean Clark, Head of Corporate Finance Matthew Essex, Head of Regeneration Andrew Millard, Head of Planning & Growth Ann Osola, Head of Highways Richard Parkin, Head of Housing and Interim Head of Environment Karen Wheeler, Head of Strategy & Communications Stephen Taylor, Programmes and Projects Manager Sarah Welton, Strategy & Performance Officer Daniel Toohey, Principal Solicitor - Contracts & Procurement Kenna-Victoria Martin, Senior Democratic Services Officer Stephanie Cox, Senior Democratic Services Officer

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Before the start of the Meeting, all present were advised that the meeting may be filmed and was being recorded, with the audio recording to be made available on the Council's website.

76. Apologies

The Leader of the Council advised that the Chief Executive, Lyn Carpenter, was unable to attend the meeting as she was conducting a Peer Review.

77. Minutes

The Minutes of Cabinet, held on 11 November 2015, were approved as a correct record.

78. Items of Urgent Business

The Leader of the Council advised that one item of urgent business had been received in relation to the Fobbing Bus Service. The report was circulated to Members and published online prior to the meeting where the report was tabled.

The Leader of the Council informed Members that the report would be taken after Item 6, Briefings on Policy and Other Issues.

79. Declaration of Interests

Councillor Okunade declared a non-pecuniary interest in respect of Agenda Item 16, 'Thameside Complex Stage 2 Report', as she was a member of TRUST which occupied offices within the Thameside Complex.

80. Statements by the Leader

There were no statements made by the Leader.

81. Mid-Year Corporate Progress and Performance Report 2015/16

Councillor Holloway, Cabinet Member for Central Services, introduced the report which combined the performance against the corporate scorecard with progress against the related deliverables as outlined in the Corporate Priority Activity Plan 2015/16. Members were informed that at the mid-year point, 82% of these indicators were either meeting or within an acceptable tolerance of their target and 96% of deliverables were progressing in line with projected timelines or within tolerance.

Councillor B. Rice advised that the Adult Social Care service now had a full team of Local Area Coordinators, which provided added value across the entire Public Sector, and reported that they had been shortlisted for the Local Government Chronicle (LGC) 'Team of the Year.'

Councillor B. Rice further reported other achievements of the service which included the introduction of 'Quickheart' and the Well Homes Initiative that had provided health checks and advice to over 560 homes.

Councillor Okunade thanked the Portfolio Holder for a comprehensive report and highlighted that through dedicated Engagement Coordinators positive work had started with care leavers to get them into education, employment or training, and that she was confident this would yield good outcomes in future.

RESOLVED:

1. **That Cabinet comments on and notes the performance at this mid-year stage and identifies, where necessary, any further areas of concern on which to focus action.**

2. **That Cabinet recommends the report to Corporate Overview & Scrutiny Committee.**

82. Fobbing Bus Service (Decision: 01104338)

Councillor Gerrish, Cabinet Member for Highways and Transportation, introduced the report which was a response to the motion unanimously agreed at Full Council on 25 November 2015, which read as follows:

"That we ask Cabinet, at its next meeting, to immediately fund an alteration to the bus route to serve Fobbing over the winter months."

In introducing the report the Cabinet Member highlighted the following key points:

- That the available budget to deliver subsidised bus services was now at zero due to the challenging financial cuts imposed on local government.
- That he had met with residents and consultations undertaken online and with Overview and Scrutiny, following which he did not believe it possible to provide no such services.
- That a revised number 11 bus service serving Horndon-on-the-Hill and Fobbing, would deliver some savings going forward.
- That depending on the success of tendering process and the Car Parking Services plan the bus service could be supported in the interim by utilising income that had been generated.

Councillor J. Kent asked the Cabinet Member which of the two routes was preferable among local residents as he noted that Cabinet had to choose between either the westbound route, running from Corringham, Fobbing and Basildon (Option A) or the eastbound route running between Fobbing, Corringham, Stanford-le-Hope, Grays and Lakeside (Option B).

In response the Cabinet Member explained that, following discussions with residents and local Ward Councillors, Option A was identified as the preferred solution to enable residents to access Basildon Hospital and shopping facilities.

Councillor G. Rice welcomed the news that the local bus service could be supported in the interim to enable elderly and vulnerable residents to access the hospital and shopping.

Councillor J. Kent expressed his disappointment at the increasingly inaccurate reporting by some sections of the local media that the 374 bus service would be re-routed through Fobbing, which he explained was never an option.

Councillor J. Kent further observed that Councillor Stewart's motion was well-timed and thanked officers and members on their work to reinstate the bus service. He explained that Local Councillors had lobbied hard on behalf of residents and now called upon residents to use the service as the Council needed evidence that the service was well-utilised in order to make a case to fund services in future.

Councillor J. Kent reported that this case was very much an exception and that going forward it would not be possible to take such ad-hoc decisions.

Members voted unanimously in favour of the recommendations, which included Option A, whereupon the Chair declared these to be carried.

RESOLVED:

That Cabinet:

1. **Agrees to fund bus service route 14, for three days a week over the Christmas season and New Year, from 15th December to 31st March 2016, and indicates a preference for the service to be run in accordance with:**

   Option A: Westbound between Corringham, Fobbing and Basildon costing £10,000

2. **Agrees to investigate provision of a bus service for Fobbing and Horndon on the Hill from April 2016.**

Reason for Decision - as stated in the report
This decision is subject to call-in

83. Petitions submitted by Members of the Public

There were no petitions submitted.

84. Questions from Non-Executive Members

No questions were submitted.

85. Matters Referred to the Cabinet for Consideration by an Overview and Scrutiny Committee

The Leader of the Council informed Members that one matter had been referred to the Cabinet by the Housing Overview and Scrutiny committee, in relation to 'Call-In to Cabinet Decision 01104415 – Housing Estate Regeneration'.

85.1 Call-In to Cabinet Decision 01104415 - Housing Estate Regeneration

Councillor J. Kent, the Leader of the Council, briefly set out the background to the call-in that Councillors Ojetola, Coxshall and Halden made to a Cabinet decision regarding Housing Estate Regeneration of the Seabrooke Rise Estate in Grays.

The report set out the discussion the Housing Overview and Scrutiny Committee made at the meeting held on the 30 November 2015, which considered the call-in.

Councillor Worrall advised that the Housing Overview and Scrutiny Committee had debated the matter at length and resolved that the original Cabinet decision was sound.

RESOLVED:

Cabinet note that the call-in was rejected.

86. Shaping the Council and Budget Update (Decision: 01104428)

Councillor J. Kent, the Leader of the Council, introduced the report which set out budget pressures in 2015/16 and the Medium Term Financial Strategy (MTFS) with a need to meet an estimated budget gap of over £28.8 million for the four years between 2016/17 and 2019/20.

In introducing the report the Leader of the Council made the following key observations:

- That the Serco contract had now been successfully transferred back to the Council and welcomed back all the staff affected.
- That £3 million would now be brought back to the Council through the transfer of the Serco contract, although there were issues surrounding Pensions that would not be fully understood until March 2016.
- That there were a number of key issues following the publication of the government's Comprehensive Spending Review, which included that the Council would now have the power to raise an additional 2% through Council Tax to fund Adult Social Care, though it was not clear how this impacted upon the Council Tax referendum limit which was expected to be announced before Christmas.

Councillor B. Rice informed Members that the Adult Social Care Service were currently requesting two growth bids; £1 million to meet the cost of the minimum wage within care provider contracts and £1 million to meet demand growth.

Councillor B. Rice further reported that she had issued a Joint Statement with The Association of Directors of Adult Social Services (ADASS) along with the NHS Confederation, the care Provider Alliance, and the Care and Support Alliance, calling for 'urgent' talks with Treasury and other Whitehall Departments in the face of a mounting crisis in the care of older and disabled people. She felt that the sector was being squeezed too hard and that the most vulnerable people would suffer and questioned what had happened to the £6 billion which had been earmarked for the full implementation of the Care Act.

Councillor G. Rice reported that he had attended a meeting of the Essex Crime Panel where the Police and Crime Commissioner had confirmed that Tilbury and Ockendon Police Stations would close, with the Corringham Police Station sold off, and that he could not provide assurances that there would not be a further reduction of Police Staff with the increasing cuts.

Councillor J. Kent highlighted that the present Police cuts were just in response to the current spending round, and the Chancellor was expected to announce further cuts during the next spending review, and therefore it was increasingly likely that Essex Police would increase the police precept by 2%.

RESOLVED:

1. **That Cabinet note that the 2015/16 operational budget pressures have been mitigated, subject to no further pressures over the winter, but that the Serco pension liability remains;**

2. **That Cabinet receive a report in January outlining actions for the Serco pension liability and sets out the proposed 2016/17 budget for consideration by Corporate Overview and Scrutiny;**

3. **That Cabinet note the headlines from the Comprehensive Spending Review and receive further updates as detail is released; and**

4. **That Cabinet note the potential impact on service budgets should the deficit forecasts be allocated on a pro rata basis.**

Reason for Decision - as stated in the report
This decision is subject to call-in

87. Local Council Tax Scheme 2016/17 (Decision: 01104429)

Councillor V. Holloway, Cabinet Member for Central Services, introduced the report which detailed the design of the Local Council Tax Scheme for 2016/17 and the results of the public consultation.

The Cabinet Member advised Members that it was proposed to continue with the existing discount scheme for a further year, with the only change in line with new Welfare Reform legislation that set the maximum claim period at 4 weeks.

RESOLVED:

1. **That the LCTS scheme for Thurrock Council is maintained with the inclusion of a reduction in the period an award can be backdated to four weeks. This reduction is in line with welfare reform legislation changes to Housing Benefit from 1 April 2016. The 2016/17 Scheme will now contain the following elements:**

    - **The first £25 per week of earned income will be disregarded when calculating levels of council tax support.**

    - **The maximum capital limit is to be set at £6,000. This means anyone who has savings over £6,000 may not receive support with their council tax.**

- **For working age claimants, the maximum support that will be allowed will be 75% of their full council tax bill.**

- **Child benefit and child maintenance received will not be included as income in the calculation of council tax support.**

- **The maximum period a claim for LCTS can be backdated when a customer provides good cause for not claiming earlier is four weeks.**

- **There is a full disregard of military compensation payments, including War Disablement Pensions, War Widow's Pension and Armed Forces Compensation Scheme payments.**

Reason for Decision - as stated in the report
This decision is subject to call-in

88. Borrowing And Investment Performance And Policy 2015/16 Mid-Year Report (Decision 01104430)

Councillor J. Kent, the Leader of the Council, introduced the report which reviewed the borrowing and investment activity and reported on the forecast outturn position for 2015/16.

Members were advised that good use was being made of the minimum revenue provision and investments which had delivered £4 million of savings to the Thurrock taxpayer.

RESOLVED:

That Cabinet note the results of Treasury Management activities undertaken in the first half of 2015/16.

Reason for Decision - as stated in the report
This decision is subject to call-in

89. 2015/16 Capital Monitoring Report (Decision 01104431)

Councillor J. Kent, the Leader of the Council, introduced the report which detailed a number of additional projects to the 2015/16 Capital Programme, along with the associated funding, and provided an update on the current position of the school capital programme in order to set out the latest forecasted outturn position.

Councillor G. Rice remarked that Thurrock had kept its Street Lighting switched on due to well managed budgets and projects, whereas across Essex other local authorities had switched their street lights off much to the disappointment of residents.

RESOLVED:

That Cabinet agrees:

1. **To note that the General Fund capital programme is projected to have unused resources of £20.766m as at 31 March 2016. This funding will be carried forward to 2016/17 to fund schemes currently under development.**

2. **To note the progress on the schools capital programme including the use of temporary accommodation and the remodelling of school accommodation to meet the increase in demand for pupil places from January 2016.**

3. **To approve the virements within the Children's service, totalling £0.2m, which will realign project budgets with projected costs;**

4. **To note that the Housing Revenue Account capital programme is projected to have no unused resources in 2015/16.**

Reason for Decision - as stated in the report
This decision is subject to call-in

90. Thurrock Local Plan: Monitoring, Timescales and Engagement Strategy (Decision 01104432)

Councillor Speight, Cabinet Member for Regeneration, introduced the report which detailed a number of changes to the Local Plan monitoring and sought approval for a revised Local Plan timetable.

In introducing the report the Cabinet Member emphasised that it was important to engage with local residents and business in order to shape the Local Plan as the document would determine Thurrock's geography and policy, and therefore the Council's ability to determine planning applications.

Councillor G. Rice welcomed the report and the proposed timetable, which he felt was important as otherwise there would be little way forward for the authority to defend greenbelt land when determining planning applications.

Councillor J. Kent remarked that not having a secure Local Plan would leave Thurrock open to speculative planning applications being submitted by developers.

Councillor Gerrish felt that this was an essential process to undertake with the local community so that issues important to residents could be lobbied on.

Councillor Worrall felt that Thurrock engaged well with the local community and cited a recent example where residents in Tilbury wanted information

online regarding the development of the Civic Square which had been swiftly acted upon by officers.

Councillor B. Rice remarked that it was important residents were consulted in order to advise on the difference between different types of land, such as brownfield and greenbelt, so that residents could make an informed judgement to shape the Borough.

Councillor Speight summed up the report, and in doing so, stated that the community and council needed to drive the way in developing a robust local plan for the Borough and for residents to understand the system so planning applications could be determined in line with resident's priorities.

RESOLVED:

That Cabinet:

1. **Approve the revised timetable set out in the Local Development Scheme – December 2015.**

2. **Grant delegated authority to the Head of Planning and Growth in consultation with the Portfolio Holder for Regeneration, Planning and Transportation to amend the Local Development Scheme if required.**

3. **Endorse Phase 1 of the Local Plan Engagement Strategy.**

Reason for Decision - as stated in the report
This decision is subject to call-in

91. Implications of the Housing & Planning Bill and Welfare Reform Bill 2015 on HRA Services and Affordable Housing Programme (Decision 01104433)

Councillor Worrall, Cabinet Member for Housing, introduced the report which presented the financial implications of the Council's Housing Revenue Account (HRA) Business Plan due to recent budget announcements and key policy changes through the government's introduction of the Housing and Planning Bill and Welfare Reform Bill 2015.

In introducing the report the Cabinet Member highlighted the following key points:

- That Thurrock had been working hard to secure good, affordable homes for local people and she was committed to the continuation of the Transforming Homes Programme.
- That the imposed 1% rent reduction would result in a £14.6 shortfall over the 4 year period from 2016/17 to 2019/20 and a £218 million shortfall over a 30 year period.

- That she was concerned with the introduction of a £30,000 income cap which would require households with a combined income of over £30,000 a year to pay full market rents in order to subsidise affordable housing elsewhere in the Country.
- That she would provide an update to Full Council in January 2016 regarding the application to the Secretary of State for an exemption.

Councillor G. Rice felt that it was unfair that hardworking residents with a combined household income of £30,000 per annum should be penalised.

Councillor B. Rice questioned how much per week of the 1% reduction would affect the delivery of the Transforming Homes programme to which the Cabinet Member advised that the average weekly impact to tenants not in receipt of benefits was £1.74 per week in 2016/17 and £6.99 by 2019/20. However the Cabinet Member reported that many residents would prefer to have new bathrooms and kitchens installed for £1.74 a week.

Councillor J. Kent observed that with rates of homelessness on the rise he was frustrated with the impact of reforms which would make lives more difficult for those who were struggling. He expressed his dismay that under the proposals Thurrock would have to sell off its much needed Council housing stock in order for the funds to be handed back to the Treasury so that they could cut the benefit bill.

Councillor Worrall proposed an amendment to recommendation 1.3 which was agreed unanimously by Members and read as follows:

1.3 Note that the application to the Secretary of state for an exemption is progressing and *that a report will be referred to Full Council in January 2016 to report on progress.*

RESOLVED:

That Cabinet:

1. **Approve the setting affordable rents for Seabrooke Rise and Derry Avenue and the rest of the HRA affordable housing programme at 70% of market rent in line with the recommendations from Housing Overview and Scrutiny on 30th November 2015.**

2. **Approve extension the of Transforming Homes programme by up to 1 year for internal improvements (1,000 homes) and up to 3 years for external improvements (5,000 homes), where the asset supports delayed completion in accordance with the recommendations from Housing Overview and Scrutiny on 30th November 2015.**

3. **Note that the application to the Secretary of state for an exemption is progressing and that a report will be referred to Full Council in January 2016 to report on progress.**

Reason for Decision - as stated in the report
This decision is subject to call-in

92. Thameside Complex Stage 2 Report (Decision 01104434)

Councillor J. Kent, the Leader of the Council, introduced the report which set out the results of the second stage options appraisal, which included findings from the cross-party Task and Finish Group report on the Thameside Complex, and considered options for theatre provision in more detail.

In introducing the report the Leader of the Council stated that he was committed to having a dedicated Civic Theatre and it was important residents and Arts Organisations, such as Thurrock Arts, were consulted and involved in the process.

Councillor B. Rice welcomed the paper and remarked that she looked forward to further developments.

Councillor Pothecary asked what the next stages were in terms of consultation with residents, to which the Leader of the Council emphasised that it was vital that talks with the community continued.

RESOLVED:

That Cabinet:

1. **Approve the long term aspiration to build a new theatre in Grays with flexible, adaptable accommodation more suited to modern needs and with the potential to generate a higher income to support the service and reduce the level of subsidy payable by the Council.**

2. **Support the undertaking of further work to develop costed proposals for the new theatre and the other services in the Thameside Complex funded through existing budgets.**

3. **Agree that, while work to develop and implement the preferred option identified through the appraisal continues, the Thameside Complex should remain open and efforts to maximise income generation from effective use of the building in the short and medium term should continue.**

4. **Acknowledge the impact that keeping the existing building open has on the assumptions which underpin the MTFS and the likely requirement for continuing capital expenditure to address health and safety requirements, maintain service levels and to secure commercial income.**

Reason for Decision - as stated in the report

This decision is subject to call-in

93. MFD (Multi-Functional Devices) Reprocurement (Decision 01104435)

Councillor V. Holloway, Cabinet Member for Central Services, introduced the report which explained that a procurement exercise needed to be undertaken in order to identify a provider to supply the Council with replacement MFD units when the existing units came to the end of their contracted terms.

Councillor Gerrish remarked that it was important to note that in driving forward back-office efficiencies the Council saved money, and welcomed opportunities to continually drive down costs to further back-office functions in future.

RESOLVED:

That Cabinet:

1. **Approve the carrying out of a procurement process to identify a new MFD provider;**

2. **On the basis of Option 2 as set out within this report, delegate authority to Director of Planning and Transportation to agree & award a new contract.**

3. **Authorise the Director of Planning and Transportation to award a contract to a provider for a Discovery Assessment, should it be necessary to contract separately for such an assessment.**

Reason for Decision - as stated in the report
This decision is subject to call-in

94. Re-Procurement of the Housing Concierge Contract (Decision 01104436)

Councillor Worrall, Cabinet Member for Housing, introduced the report which set out the proposals for the re-procurement of the Housing concierge contract which would operate at the Chadwell St Mary High Rise tenanted blocks in Godman Road, Chadwell St Mary and at one of the Extra Care facilities, located at Piggs Corner Sheltered Housing Scheme, Southend Road, Grays.

Members were advised that local residents valued the scheme which was part of the 'Invest to Stay' scheme.

Councillor B. Rice observed that this was a good example of Adult Social Care and Housing working well together in order to release costs from the Adult Social Care Service.

Councillor G. Rice explained that residents of Chadwell St Mary were delighted with the service.

RESOLVED:

That Cabinet:

1. **Agree the proposed process for re-procurement of the Housing concierge contract for a period of up to 5 years (3 years plus 1+1year periods, subject to performance and funding).**

2. **Approve delegation to award to the Interim Director of Housing in consultation with the Portfolio holder in order to ensure service continuity.**

Reason for Decision - as stated in the report
This decision is subject to call-in

95. Car Parking Services (Decision 01104337)

Councillor Pothecary, Cabinet Member for Communities and Public Protection, introduced the report which recommended a number of investments in order to improve parking provision, which included the creation of new car parks in Purfleet, South Ockendon and Grays Beach, and proposed an increase in income in order to fund the improvements.

Councillor V. Holloway welcomed the proposed improvements to car parking provision by Purfleet train station and the continued Residents Scheme, as residents in the area experienced difficulties with vehicles parking on pavements.

Councillor Gerrish, as local Ward Councillor, also welcomed the proposed improvements in Purfleet and explained that the income generated was key to delivering transport improvements across the service.

Councillor Worrall observed that the hard-standing improvements to Grays Beach Car Park would be welcomed by residents which would alleviate pressure on spaces taken by commuters. She further reported parking difficulties that residents experienced along Dock Road, Tilbury and asked whether any measures could be implemented in that location to alleviate the problem.

Councillor Okunade felt that it was beneficial to offer additional car parking in order to help local residents.

Councillor Pothecary observed that commuters were often willing to pay for parking if it was not prohibitively expensive, and that she would speak to the Head of Highways and Transportation regarding Councillor Worrall's request but that it was important communities were consulted to identify which parking measures they preferred.

RESOLVED:

That Cabinet:

1. **Approves new car parks (subject to planning permission), with approximately 87 spaces, for commuters at Purfleet railway station and in Tamarisk Road, Ockendon, that are opened before the end of the financial year with charges shown in appendix 2.**

2. **Approves an extension to Grays Beach car park (subject to planning permission), with approximately 80 additional spaces, to support commuters and visitors to the area and is opened before the end of the financial year with charges shown in appendix 2.**

3. **Confirms free shopper parking at Council owned car parks and on-street parking bays, for all Saturdays in December 2015 and approves delegated authority to the Director of Planning and Transportation, in consultation with relevant Portfolio Holder, to carry out this arrangement on an annual basis.**

4. **Confirms that 'on street' parking charges are frozen for another year but approves the implementation of the revised Thurrock Council 'off street' parking fees and other charges, included at appendix 2 of this report.**

5. **Approves the implementation of operational changes set out in paragraphs 3.3, 3.4 and 3.5. which confirms that residents parking will remain free.**

Reason for Decision - as stated in the report
This decision is subject to call-in

The Leader of the Council advised all those present that the meeting was the last meeting of Cabinet in 2015, thanked officers and Members for all their hard work and wished everyone a Happy New Year.

The meeting finished at 8.22 pm

Approved as a true and correct record

CHAIR

DATE

Any queries regarding these Minutes, please contact Democratic Services at Direct.Democracy@thurrock.gov.uk

13 January 2016	ITEM: 6.1
Cabinet	
Corporate Performance Summary – Month 7 (Up To End of October 2015)	
Update report of: Councillor Victoria Holloway, Portfolio Holder for Central Services	
Accountable Head of Service: Karen Wheeler, Head of Strategy & Communications	
Accountable Director: Steve Cox, Assistant Chief Executive	
This report is public	

This briefing note provides Cabinet with a summary of performance against the Corporate Scorecard 2015/16, a basket of key performance indicators, as at Month 7 - end of October 2015. These indicators are used to monitor the performance of key priorities set out in the Corporate Plan and enables Members, Directors and other leaders to form an opinion as to the delivery of these priorities.

At the end of each quarter a full report is presented to Cabinet and to Corporate Overview and Scrutiny Committee. This briefing note is high level and there are no direct legal, financial or diversity implications arising. Within the corporate scorecard there are some specific financial and diversity related performance indicators, for which monitoring is undertaken each month. A full implications assessment is undertaken for the quarterly performance reports.

Performance Report Headlines

At the end of Month 7, 87% of these monthly indicators are either meeting or within an acceptable tolerance of their target.

RAG status	Monthly KPIs at end of October 2015	*Direction of Travel (DOT) compared to last year*	DOT at end of October 2015
GREEN - Met their target	47.83%	↑ IMPROVED	40.74%
AMBER - Within tolerance	39.13%	→ STATIC	22.22%
RED - did not meet target	13.04%	↓ DECLINED	37.04%

The performance of the indicators within the corporate scorecard needs to be considered against the backdrop of the national austerity measures and reduced resources, and in particular, how these measures impact on the Council's finances

and demands for services. However, the fact that 87% of the monthly KPIs are currently hitting or within tolerance of target is encouraging.

KPIs 'IN FOCUS'

The Performance Board has identified the following issues to be **IN FOCUS** this month:

RAG	DOT from last year	Measure	Data	
RED	Worse	**% of 16-19 yr olds Not in Education, Employment of Training (NEET)**	**October Actual/YTD**	**6.1**
			October Target	**5.2**
			Year End Target	**5**

The NEET figure is above target due to a delay in the outcomes of the European Social Fund (ESF) bid which impacted on provision being delivered for 16-19 NEET. This is now being corrected internally with a range of tailored training provision delivered by personal advisers and youth workers to fill the training gap whilst the results of the bid are coming through.

NEET young people are being offered individualised programmes to build on self-esteem and confidence whilst engaging young people in the community by providing volunteering and work experience opportunities. This internal delivery will support the reduction of NEET and provide engagement programmes that utilises our outdoor education centre.

More detail about NEETs can be found in the *Pathways for Youth Employment and Work Experience Report* later on this agenda.

RAG	DOT from last year	Measure	Data	
GREEN	No direct comparison as KPI definition has changed	**Permanent Admissions to residential/nursing homes per 100K population 18yrs+**	**October Actual/YTD**	**91**
			October Target	**94.5**
			Year End Target	**163**

The 2015/16 target was set in line with the 2014/15 definition for this national indicator. However, during 2015/16 the definition has changed and the Council is now required to include those who are "full costers", i.e. those who following financial assessment are required to pay back 100% of the costs paid for services back to the Council.

Quarter 1 (April – June) data was used as a baseline to calculate the average number of full costers expected in year (to allow for time delay for financial assessment completion).

There were a total of 13 additional admissions due to the inclusion of full costers in this reporting period, which equates to an average of 4.3 per month (52 additional admissions if projected to year end using this average).

The original target of 121 equated to 152 admissions, so with an additional 52 expected (total of 204) the year-end target has now been reset at 163 per 100,000 population. Monthly targets have also been aligned.

Report Author:

Sarah Welton

Strategy & Performance Officer, Strategy Team

Monthly Key Performance Indicator summary

Monthly KPI	Unit	High /Low	Oct 14	Nov 14	Dec 14	Jan 15	Feb 15	Mar 15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sept-15	Oct-15	Latest Target	End of Year Target	DOT (since last year)	RAG
16-19 yr old Not in Education, Employment or Training (NEET)	%	Low	5.6	5.3	5.3	5.3	5.2	5.5	5.8	5.7	5.5	6.1	6.2	5.7	6.1	5.2	5	Worse	R
% of 19-21 yr old care leavers in Education, Employment or Training	%	High	n/a			35			0	33.3	41.2	47.6	48.4	54.5	54.4	70	70	Better	A
Children subject to Child Protect Plan*	Rate	-	43.7	42.4	42	46	51	52	54	54	51	50	53	55	56	No target*	n/a	Worse	n/a
Rate of Looked After Children*	Rate	-	76.6	78	75	74	71	72	71	73	74	76	79	81	85	No target*	n/a	Worse	n/a
% of Major planning applications processed in 13 weeks	%	High	83.3	85	85.7	86.4	87.5	84	66.7	60	71.4	75	77.8	80	82.6	75	75	Worse	G
% of Minor planning applications processed in 8 weeks	%	High	91.8	90.4	89.9	89	88.8	88.3	76.9	81.5	83.7	85.2	88.6	89.5	91.2	88	88	In line	G
No of apprenticeships within the council	No	High	27	27	35	43	47	52	4	9	15	20	23	25	30	45	65	Better	A
No of households at risk of homelessness approaching the Council for assistance	No	Low	n/a			2670			203	473	716	989	1214	1441	1705	1400 (Baseline)	2400	Worse	n/a
% General Satisfaction of tenants with neighbourhoods/services provided by Housing	%	High	70	74	70	70	70	70	73	71	71	70	70	70	70	75	75	In line	A
% of properties transformed against planned programme	%	High	100			100			100	100	100	100	100	100	100	100	100	In line	G
Permanent admissions to residential / nursing homes per 100K pop. 18yrs+	Rate	Low	n/a	n/a	n/a	n/a	n/a	n/a	13	28	43	60	73	81	91	94.5	163	n/a	G
% adult social care users in receipt of Self Directed Support	%	High	71.9	72	72	72	72	72	64	64	64	75	76	75	75	75	75	Better	G
No of households assisted to move to a smaller property (downsize)	No	High	33	41	49	56	62	68	11	17	22	28	32	40	45	30	55	Better	G
% Household waste reused/ recycled/ composted (in month)	%	High	43	37	36	34	33	40.38	43	44	44.4	41	41.5	42.99	40.19	47.09	48	Worse	R
Municipal waste sent to landfill (cumulative)	%	Low	20	20.2	19	20	19	19	24.2	27.25	30.6	27.3	25.2	23	21	19	19	Worse	R
% of refuse bins emptied on correct day	%	High	n/a					98	98.8	97.8	97.6	99.4	98.2	99	98.5	98.5	98.5	Better	G
Tonnage of street waste (In month - not cumulative position)	Tonnes	Low	n/a			n/a			293	304	261	294	229	256	255	No target*	n/a	n/a	n/a
Number of reported incidents of fly tipping	No	Low	n/a	n/a	124	143	153	197	234	179	316	225	182	191	184	No target*	n/a	Worse	n/a
Number of reported incidents of abandoned vehicles	No	Low	n/a	n/a	38	50	57	101	69.00	57.00	86.00	84.00	74.00	77	87	No target*	n/a	Worse	n/a
Average sickness absence per employee	Days	Low	5.6	6.52	7.42	8.27	9.02	9.87	0.76	1.5	2.32	3.16	3.82	4.57	5.44	5.25	9	Better	A
% long term sickness	%	Low	51	51	50	48	48	46	49	46	43	47	48	47	47	39	34	Better	A
% stress/stress related absence	%	Low	21.52	19	20.5	16.87	16.9	17.5	19.1	18.7	19.45	19.2	18.2	16.65	16.32	20	18	Better	G
Overall variance on General Fund	%	0	0	0	0	0	0	0	/	/	0	0	0	0	0	0	0	In line	G
Overall variance on HRA	£k	0	0	-617	-413	-600	-600	-2485	/	/	0	0	0	0	0	0	0	In line	G
% invoices paid within timescale	%	High	93.97	94.37	94.56	94.62	94.76	95.01	96.92	95.46	95.22	95.2	94.92	94.94	95.1	97	97	Better	A
% Council Tax collected	%	High	62.8	71.28	79.77	88.23	93.31	98.71	10.67	19.4	28.21	36.95	45.48	54.22	62.88	63.1	98.9	In line	A
% National Non-Domestic Rates (NNDR) collected	%	High	66.37	74.97	83.91	92.13	96.37	99.68	10.12	20.2	29.76	39.66	48.56	57.96	66.79	69.01	99.3	Better	A
% Rent collected	%	High	95	95.5	97.1	97.1	97.1	99.4	78.8	85.45	91.48	92.54	94.78	95.62	95.59	94.0	99.5	Better	G
% timeliness of all Complaints	%	High	98.8	98.21	98.19	98.23	98.38	98.3	94.8	96.8	96.5	96.5	97.2	97.6	97.87	98	98	Worse	A

**Indicators stated as having "no target" are demand indicators not performance indicators. In the case of some indicators, the in-year use of RED status is an alert rather than necessarily an indication of poor performance.*

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13 January 2016	ITEM: 10 (Decision 01104338)

Cabinet

Shaping the Council and Budget Update

Wards and communities affected:	Key Decision:
All	Key

Report of: Councillor John Kent, Leader of the Council

Accountable Head of Service: Sean Clark, Director of Finance and IT

Accountable Director: Lyn Carpenter, Chief Executive

This report is Public

Executive Summary

There have been a number of reports considered by Cabinet throughout the municipal year on the relevant financial positions for 2015/16, 2016/17 and the medium term.

The previous report updated Cabinet on the latest position whilst also setting out the main elements of the Comprehensive Spending Review (CSR).

This report now sets out the latest position for 2015/16 and presents Cabinet with an update on the provisional grant settlement announced on 17 December 2015 and its impact on the 2016/17 financial position. The report also recommends a draft budget approach for the coming year.

1. Recommendation(s):

1.1 That Cabinet note that there is still a forecast budget deficit of circa £0.3m for 2015/16;

1.2 That Cabinet recommends to Council the approach of capitalising the budget provision for the Minimum Revenue Provision (MRP), starting in the current financial year;

1.3 That Cabinet note the assumption of a 2% Council Tax increase to provide additional funding towards the cost of Adult Social Care;

1.4 That Cabinet note the assumption of a 1.99% Council Tax increase to support the Council's resource base going forward; and

1.5 That Cabinet note this draft budget and ask Corporate Overview and Scrutiny to comment and make recommendations back to Cabinet in February.

2 Shaping the Council

2.1 The Comprehensive Spending Review (CSR) announced on 25 November 2015 and the subsequent grant announcement on 17 December 2015 was very clear on a number of financial points:

a) That, as Thurrock Council has budgeted, the Revenue Support Grant (RSG) will be abolished over the life of this parliament through a continuation of year on year reductions in addition to the £29m lost between 2010/11 and 2015/16;

b) That, as a result of this, Council's will be reliant on raising necessary funding locally through Council Tax, Business Rates and other Income Generation;

c) That Business Rates collected in any one area will still be subject to tariffs and top ups – in other words, for Thurrock Council, the Council will still have to pay a significant proportion of the Business Rates it collects to central government for redistribution; and

d) That, as a result of more Business Rates being available to councils nationally, there will be added obligations for councils to meet. These new duties have not yet been announced and will be subject to consultation over the coming months but it is likely that any increased funding will be absorbed by these new requirements.

2.2 It is clear from the above that councils will have to rely more on local income generation, particularly from Council Tax, to meet a growing range of services going forward. Members will be required to consider difficult challenges throughout 2016, the first being the need to agree Council Tax increases for 2016/17 and these are set out later in this report.

2.3 It will also be essential that 2016/17 includes a budget provision for the preparation that will be required to:

a) Increase income through both existing charges and securing additional income streams;

b) Continue the work on rationalising the Council's assets to reduce costs and maximise income potential;

c) Drive efficiencies through better ways of working;

d) Finance spend to save initiatives;

e) Investigate and implement new Delivery Models; and

f) Finance organisational change where necessary.

2.4 The proposals in this report include a budget for this purpose.

3 Provisional Grant Settlement

3.1 The 2016/17 provisional finance settlement represents the fourth year in which the Business Rates Retention (BRR) scheme is the principal form of local government funding. As in the previous three years, the provisional settlement provides authorities with a combination of provisional grant allocations and their baseline figures within the BRR scheme.

3.2 The provisional figures are expected to be confirmed in late January/early February 2016 (within the final settlement announcement).

3.3 A new methodology for determining authorities' Revenue Support Grant (RSG) allocations has been proposed within the provisional settlement. Rather than applying the same percentage cut to all authorities, the new approach takes into account individual authorities' council tax raising ability and the type of services provide.

3.4 Even considering the above, the reductions to Thurrock Council's grant support are significant and further support the need for change going forward:

Financial Year	£m Reduction
2010/11-2015/16	29.0
2016/17	6.5
2017/18	6.0
2018/19	4.0
2019/20	3.9
	59.4

3.5 In terms of the New Homes Bonus (NHB), it appears that there are no changes to the scheme planned before 2018/19 and the amounts for 2016/17 and 2017/18 would be consistent with authorities receiving allocations as per the current system. However, indications are that there will be reductions in

NHB over the life of this settlement and that the scheme itself could well be scrapped.

3.6 Thurrock Council had planned on £3.31m in 2016/17 increasing to £4.345m in 2019/20. This has proven to be optimistic due to a lower number of properties being brought into use and the MTFS will be adjusted to reflect these reduced amounts.

3.7 Although there are indications that any future reductions in NHB will be redistributed, the basis and mechanism for this is unknown. As such, the revised MTFS to be presented in February will look to phase out the dependency on this funding stream and this is in keeping with the direction towards financial self-sustainability.

3.8 Public Health Grant – There remains some uncertainty over the level of cut in the Public Health Grant (PHG) next year. The Autumn Statement confirmed that the ring fence would continue for a further 2 years – 2016/17 and 2017/18 but then stated that the PHG would be reduced by approximately 4%. It is not clear whether this 4% reduction is in addition to the in-year cut of 6.2% imposed during this financial year or is the final reduction. The Department of Health has also recently consulted on a new formula for distributing the PHG – based more on local need rather than previous PCT expenditure levels. A needs based formula would benefit Thurrock but it is not clear when this will be introduced. A further report on the PHG will be submitted to Health and Well-Being Scrutiny Committee when the position is clearer but in line with the previous policy any reductions in the PHG will have to come out of the services commissioned by the PHG.

3.9 There is no additional Better Care Funding (BCF) in 2016/17. Although the provisional settlement demonstrated growth for the BCF by 2019/20 it should be remembered that the current BCF was formed from existing council and CCG budgets. There has been no clarification as yet as to whether this is new funding or not.

Council Tax

3.10 The grant announcement confirmed that there would no longer be a freeze grant offered to councils. As the MTFS had assumed a grant would be available, this makes the Council's financial position worse by £0.6m.

3.11 The government's spending power calculation for all councils with adult social care responsibility assumes increases of 3.75% representing a general council tax increase of 1.75% per annum over the life of the settlement, in line with CPI, plus the additional 2% Social Care precept. This is a complete reversal from previous government policy on council tax with the settlement assuming increases in Council Tax for both general purposes and for the additional 2% available under the Social Care precept.

3.12 For Thurrock Council, a referendum will be triggered where council tax is increased by 4% or more above the authority's relevant basic amount of

council tax for 2015/16. Due to the loss of assumed freeze grant and the low Council Tax level, the lowest in Essex and in the lowest ten unitary councils nationally, **a 3.99% increase is recommended** that will raise some £2.2m in 2016/17 and make some headway towards the more difficult task of balancing 2017/18 and beyond.

3.13 A 3.99% increase in Council Tax equates to £44.87 for a Band D property in Thurrock. Some 70% of properties in Thurrock are Bands A-C where the increase ranges from £29.91 - £39.88 per year or £0.57 - £0.77 per week.

4 Minimum Revenue Provision (MRP)

4.1 Cabinet have already received updates in previous reports about the work on MRP that has reduced the annual MRP budget from £6m to £3.7m per annum. Further work has now identified that this reduced MRP budget can be funded through capital receipts and this approach has been agreed with the external auditors.

4.2 Council would be required to agree a change in the Annual Minimum Revenue Provision Statement and this is being built into the Treasury Management Strategy report to be considered by Council in February. This is simply adding a line allowing capital receipts to be used for this purpose.

4.3 Cabinet also need to be aware of the downsides to this approach. Simply, this means that capital receipts will be used for the write down of debt and not for investment in capital projects and this will lead to further prudential borrowing to replace this funding. Secondly, achieving a constant level of capital receipts to finance MRP through this approach is not sustainable due to both the nature of negotiations and legal requirements as well as supply. As soon as there are insufficient capital receipts for this approach, the budget (and this is a statutory requirement) will have to be financed through revenue thus increasing the pressures within the MTFS.

4.4 As such, it is recommended that the approach is implemented in 2015/16 to meet the exceptional one off cost of the Serco pensions but is not built into future budgets but the opportunity be retained to meet exceptional circumstances going forward.

5 Medium Term Financial Strategy (MTFS)

2015/16

5.1 The previous reports have demonstrated significant in-year operational pressures in excess of £6m and that these have now been mitigated by services as far as is possible with a quarter of the year remaining. However, Members must have regard to the following concerns:

- This balance is on the operational budget as currently projected. There could well be further pressures over the winter months, especially in terms of environment and social care; and

- The Council still has to finance the Serco termination pension surplus. This has previously been estimated at £3m and, although reducing my estimate to £2.5m due to economic factors and time delays in agreeing a settlement figure brought about by the complexity of the calculation, this still has to be financed and we have no further reserves, as previously reported.

5.2 To meet this outstanding balance, it is recommended to use £2.2m of capital receipts towards MRP – this is in line with available capital receipts in 2015/16 and fits with the phased approach as set out above.

5.3 Recent analysis has shown that income generation is higher than previously forecast and DB has recently reinforced the austerity measures. No further non-essential expenditure to be approved. These two areas may well contribute to meeting the remaining balance but this cannot be relied upon at this stage.

5.4 Subject to no further pressures or material difference in the Serco pension estimate, this will result in expenditure largely being contained within the budget envelope for 2015/16 though there remains a balance of circa £300k still to be identified if the use of reserves is to be avoided.

2016/17

5.5 The figures below assume that previously agreed savings of £3.35m will be achieved next year and these have been set out in previous reports. Members should note that some of the savings, previously agreed by Cabinet/Council are not straightforward or easy to delivery.

5.6 The previous budget report increased the outstanding pressure for next year to £4.98m due to the increased growth requests over and above the previous provision. As a reminder, the growth requested by the services for Adults' and Children's social care as follows:

- Adults - £1m – the impact of national Living Wage increases in 2016/17 has been calculated at circa £1.5m. The service is looking to mitigate this impact where possible and is therefore seeking a lower growth sum;
- Adults - £1m – cost of care provision, including growth in areas such as autism and dementia; and
- Children's - £3m – this is a draft request based on a number of the pressures reported previously to Cabinet. Directors' Board will continue to monitor any further pressures.

5.7 As previously reported, the growth bids are still subject to ongoing challenge and they do not include any growth for other services such as Environment or for spend to save initiatives or to finance Shaping the Council activity.

5.8 The CSR has then added to these pressures through the apprentice levy (£260k) and National Insurance changes (£200k), with the loss of the freeze grant adding a further £600k. These raise the pressure to £6.1m.

5.9 The MTFS had assumed an overall net reduction in government support for 2016/17 of £7.5m. Detailed work on the settlement has been carried out and has recognised a reduction of £6.5m but there are a number of issues to still be considered:

a) Not all detail has been released, especially in terms of service specific grants; and

b) That this is still a provisional settlement with a final announcement not expected until the end of January or even February.

5.10 Assuming this to be correct, the outstanding balance reduces to £5.1m.

5.11 The following table sets out the recommended approach to both meeting this outstanding balance whilst creating a contingency for any further grant reductions and a Shaping the Council budget to meet the future challenges:

	£m	
Reduction in Growth	0.500	It is recommended not to allocate growth to a specific service at this time but to create a provision within the base budget of £4.5m, a reduction of £0.5m. This would be under the budgetary control of the Chief Executive and Director of Finance and IT and allocated throughout the year once the net effect of pressures and mitigation are proven
Review of Recharges post Serco termination	0.500	A review of recharges between the general fund, HRA and capital has taken place post Serco transfer and this realises further savings circa £0.5m
Council Tax	1.100	The government's own spending power predictions for all councils include an increase in Council Tax and the referendum limit has been set at 2%. As such, a 1.99% increase is recommended.
ASC Council Tax	1.100	The government was clear that Councils should raise the additional 2% from Council Tax towards the cost of Adult Social Care. This is very much a reversal of policy where the

		recommendation has been to freeze council tax but all government projections assume that this additional funding will be adopted
Gloriana	0.600	The interest differential between what the Council pays the lender and receives from Gloriana is £0.6m in 2016/17
Organisational Change	1.200	Further savings from Serco management costs, savings from the Council's client teams, senior management restructure and Thurrock Online savings from within services previously managed through the Serco contract.
Income Generation	0.500	A review of fees and charges and other opportunities has identified and allocated a further £0.5m to the income target within services.
Alternative Delivery Models	0.200	Target for the Legal Service trading model
	5.700	

5.12 The surplus that these proposals create will be used proactively to action the initiatives set out in 2.3 of this report to meet the future MTFS pressures that the Council faces.

The Medium Term

5.13 As previously reported, the Council faces a further £25.5m over the period 2017/18 to 2019/20, with a pressure of £11.1m in 2017/18 alone.

5.14 Should the above position for 2016/17 be realised, this would provide a reduction to the pressure in 2017/18 and there may well be further changes as a result of the indicative grant settlements for future years that have been issued.

5.15 These will all be set out in a revised MTFS in February 2016 but what is already clear is that a significant reduction to the Council's net expenditure is required.

5.16 It is clear that both revenue and capital investment will be required over the coming months to support the levels of change required to meet these medium term pressures. The contingent sum set out in previous paragraphs along with strong control of growth pressures is essential to achieve this.

6 Issues, Options and Analysis of Options

6.1 The issues and options are set out in the body of this report in the context of the latest MTFS and informed by discussions with the Leader of the Council, Group Leaders and Directors' Board.

7 Reasons for Recommendation

7.1 The Council has a statutory requirement to set a balanced budget annually. This report sets out the budget pressures in 2015/16 and 2016/17 along with actions to mitigate these pressures and create a budget to implement changes required to Reshape the Council.

8 Consultation (including Overview and Scrutiny, if applicable)

8.1 Corporate Overview and Scrutiny Committee considered the summary information from each of the Budget Review Panels and will continue to have a role in overseeing the process.

8.2 This report has been developed in consultation with the Leader, Portfolio Holders and Group Leaders and Directors Board.

8.3 Consultation meetings will take place with the voluntary sector, Community Forum chairs and Business Board in January 2016 to discuss the budget position and savings the Council needs to make in the next few years.

8.4 New webpages have been created, with a link from the home page of the Council's website, setting out the reduction in Government grant since 2010, how the Council is funded and things that residents can do to help reduce costs such as recycle and access services online. These pages will be added to throughout the budget planning process and will provide a basis for other communication activity through to budget setting in February including providing information to every household with the Council Tax bills.

9 Impact on corporate policies, priorities, performance and community impact

9.1 The implementation of savings proposals has already reduced service delivery levels and our ability to meet statutory requirements, impacting on the community and staff. Delivering further savings in addition to those previously agreed is particularly challenging in light of the cumulative impact of such a significant reduction in budget and in the context of a growing population and service demand pressures within children's and adult social care and housing, and legislative changes. As such, a new approach aims to establish sustainable and innovative ways of delivering services in the future to mitigate this impact.

9.2 There is a risk that some agreed savings may result in increased demand for more costly interventions if needs escalate particularly in social care. This will

need to be closely monitored. The potential impact on the Council's ability to safeguard children and adults will be kept carefully under review and mitigating actions taken where required.

10 Implications

10.1 Financial

Implications verified by: **Sean Clark**

Director of Finance and IT

The financial implications are set out in the body of this report.

Council officers have a legal responsibility to ensure that the Council can contain spend within its available resources. Regular budget monitoring reports will continue to come to Cabinet and be considered by the Directors Board and management teams in order to maintain effective controls on expenditure during this period of enhanced risk. Austerity measures in place are continually reinforced across the Council in order to reduce ancillary spend and to ensure that everyone is aware of the importance and value of every pound of the taxpayers money that is spent by the Council.

This report does not just set out the actions required to set the budget for 2016/17 but provides a financial framework to facilitate change going forward.

10.2 Legal

Implications verified by: **David Lawson**

Deputy Head of Legal & Governance - Deputy Monitoring Officer

There are no direct legal implications arising from this report.

There are statutory requirements of the Council's Section 151 Officer in relation to setting a balanced budget. The Local Government Finance Act 1988 (Section 114) prescribes that the responsible financial officer "must make a report if he considers that a decision has been made or is about to be made involving expenditure which is unlawful or which, if pursued to its conclusion, would be unlawful and likely to cause a loss or deficiency to the authority". This includes an unbalanced budget.

10.3 Diversity and Equality

Implications verified by: **Natalie Warren**

Community Development and Equalities Manager

There are no specific diversity and equalities implications as part of this report. A comprehensive Community and Equality Impact Assessment (CEIA)

will be completed for any specific savings proposals developed from the Panel's discussions and informed by consultation outcomes to feed into final decision making. The cumulative impact will also be closely monitored and reported to Members.

10.4 **Other implications (where significant – i.e. Staff, Health, Sustainability, Crime and Disorder)**

Any other significant implications will be identified in any individual savings proposal business case to inform the consultation process where applicable and final decision making.

11 Background papers used in preparing the report (including their location on the Council's website or identification whether any are exempt or protected by copyright):

- Budget working papers held in Corporate Finance
- Budget Review Panel papers held in Strategy and Communications

12 Appendices to the report

- None

Report Authors:

Sean Clark, Director of Finance and IT, Chief Executive's Office

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13 January 2016	ITEM: 11 (Decision 01104339)

Cabinet

Pathways For Youth Employment And Work Experience

Report of: Councillor J Halden, Chairman of the Children's Service's Committee	
Wards and communities affected: All	**Key Decision:** Key
Accountable Head of Service: Michelle Lucas, Head of Department	
Accountable Director: Carmel Littleton, Director of Children's Service's	
This report is Public	
Purpose of Report: To review the offer of work experience in the Borough, its effectiveness on preparing young people for job opportunities, and areas of reform.	

Executive Summary

Thurrock's economic growth and ease of access to the city means that job opportunities here for young people are almost unrivalled. This makes it even more vital to ensure that young people are ready for the world of work with the correct skills to make sure that their opportunities are fully realised.

Work experience can be very patchy across the country– with provision ranging from comprehensive and full work place preparation, to limited or no provision at all, or some examples of having non-traditional work experience being skilfully incorporated into the curriculum.

The purpose of this group, set up as a Task and Finish Group under the Children's Service's Overview and Scrutiny Committee, is to try and disseminate best practice across Thurrock and create the right to environment to ensure that quality work experience is actively contributing to the future prospects of our students.

The Task and Finish Group was primarily concerned with the 11-16 age bracket which is prior to 6th form / college education and the common age of taking on part time work. The group took evidence from local businesses, educational providers, and included the Thurrock Youth Cabinet in all meetings of the group. The group was comprised of Cllr James Halden (Conservative, Homesteads) as Chair, Cllr Graham Snell (UKIP, Stifford Clays), and Cllr Steve Liddiard (Labour, Tilbury St Chads).

1. Recommendation(S):

1.1 That work experience offers became a part of the published admissions information given to parents and students when deciding upon a school.

1.2 Work experience quality to become a part of the education awards and the business awards.

1.3 Thurrock Council offers a small amount of premium provision work experience places as a part of a Borough wide award for young people's community service.

1.4 Youth Cabinet and Thurrock Youth Services to support schools and young people who wish to shape their own work experience offer.

1.5 Thurrock Council continues to work with Ensign Buses and C2C regarding the associated travel costs of work experience.

1.6 That a request is made to the Chair of the Thurrock Business Board for a future agenda item on Youth Employment and Work Experience, that takes account of the outcomes from the recent Business:Education Summit.

2. Introduction and Background

2.1 In late 2014, Cllr Halden and Cllr Morris Cook brought the issue of Work Experience to the Children's Service's Overview and Scrutiny Committee, after it was initially discussed in the previous municipal year with the late Cllr Hale. However with each school having the flexibility to set their own programme, it was decided that the subject was far too vast for a single committee debate. Given the value of work experience, it was suggested and accepted that it should be the subject to a full T&F.

2.2 During the first meeting in February 2015, it was decided that the Chair should write to certain schools and businesses that offered the most diverse view of the local education/employment market to gather evidence regarding local provision. The partners written to were – The Port of Tilbury, High House Production Park, DP World, Lakeside, Palmers College, Gable Hall, the Gateway Academy, Grays Convent, and the Ockendon Academy.

2.3 It was also decided that the Youth Cabinet should be heavily involved to get their skills and enthusiasm involved with tangible governing experience.

2.4 Schools responded positively; from Palmers sending their Deputy Head in person, Grays Convent writing in, and Gable Hall Head Dr Asong talking on the phone with the Chair. The business feedback was very disappointing with no one responding formally. It was suggested that not only to write

back to these businesses, but to also approach them in person where possible.

2.5 Schools have flexibility in regards to the provision of initiatives that support the teaching of employment skills and so on.

3. Issues, Options and Analysis of Options

3.1 Committee stated that quality work experience was clearly very valuable in terms of giving insight into working life and an introduction into qualities like punctuality and professionalism. However it was also agreed that work placements where you "make the tea for the guy who makes the coffee" offers little benefit. Sadly such an image can devalue the general impression of work experience and therefore the perception of its usefulness.

3.2 Committee agreed that Thurrock students have a tremendous advantage given the growth agenda and opportunities in London. A concern was raised that some young people, certainly those from poorer backgrounds, can at times have lower expectations for what the local economy has to offer, maybe due to historical employment patterns locally. Good insights to working via work experience can help raise ambition and therefore outcomes.

3.3 Committee also disagreed with the Wolfe Report which stated that pre16 work experience offered little benefit. Quality work experience complements education certainly at an early age where it can provide insight into life beyond that education. It was mentioned that working environment skills can help shape a young person's outlook and expectations at a time where good habits are easiest to learn and this insight can inform their GCSE and A-level "options" sections. The more links that can be made between education and employment must surely be a positive thing for the future.

3.4 The Youth Cabinet representatives were invaluable. They offered key anecdotal evidence, from one young person whose work experience was not fulfilling because it was confined only to retail, one who wanted a work experience offer but it was not available, and one where the young person was supported by their school and Thurrock Council officers to activity go out and find their own placement. It is clear that having a lack of certainly of a quality and valuable experience is a real issue, and one that you would not tolerate if it was something such as not knowing a schools sport or extra-curricular provision.

3.5 The issue of work experience ranked top of a young person's ballot as an important issue effecting them 2 years in a row. The desire for quality work experience amongst young people is clear.

3.6 It was discussed that positive work has been done with Ensign Buses to make transport more affordable for young people in Thurrock, but the cost can still be prohibitive, certainly if we want more ambitious placements. In

addition, it did also seem that some providers may have been confused over the issue that Thurrock Council could cover the cost of all health and safety checks and insurance costs.

4. Delivery Plan

4.1 In order to address the issue of provision being patchy across different institutions, the task and finish group feels that the offer of work experience should be a part of the information that parents and students are given at the admissions stage, so it can form a part of the total offer that schools use to compete with each other for students and are judged on like sporting facilities, exam results and so on, which ultimately drives up quality.

4.2 To disseminate best practice across the Borough, quality work experience placements should form a part of the education awards and business awards. Council can use a judge based matrix similar to other awards to quantify what value for money and quality work experience looks like. Council can also compile a booklet on best practise from across Thurrock for dissemination.

4.3 To help promote the values of work experience and community service amongst young people, the council should offer a few placements with extremely high quality providers who also offer further pastoral support post placement as a reward based on community service carried out by young people. This would have a limited cost per placement but would kick off a great Borough wide competition which would raise both the profile of the good young people do in the community, but also underscore what a value work experience can be.

4.4 As a part of making sure the Youth Cabinet's experience and insight aids their peers, the Thurrock youth team will assist the Youth Cabinet efforts to work with schools for those young people who want to shape their own work experience. This can include offer experience with setting up a placement based on interests or potential carers routs, to making sure health and safety checks and other issues and options are addressed speedily. It is vital that this work experience is valuable i.e. not working for a family business in name, but in reality not doing any work.

4.5 The Chair undertook to write to C2C and Ensign and ask if they could offer the free transport for a limited 2 week slot for students in need during work experience as a part of their corporate responsibility.

5. Reasons For Recommendation:

5.1 To fulfil the ambition of making work experience that can help lead to meaning full employment a known and clear quality, and to foster an environment where great work experience is held up as an example that all providers need to aspire to for their students.

6. CONSULTATION (including Overview and Scrutiny, if applicable)

6.1 The Youth Cabinet have been involved in each meeting, and this report will be presented to the Youth Cabinet, prior to going to committee for debate and a vote.

6.2 The committee was entirely cross party having been comprised of one Conservative Councillor, one UKIP Councillor and one Labour Councillor.

7. Impact On Corporate Policies, Priorities, Performance And Community Impact

7.1 this is in line with our commitment of making sure that Thurrock is a place of opportunity for all, and helping to get young people into a position where they can make the best use of local employment opportunities.

8. Implications

8.1 **Financial**

Implications verified by: **Kay Gooacre**
Finance Manager

There are no direct financial implications. Work is underway to negotiate with local bus companies affordable arrangements for students to travel to work placements.

8.2 **Legal**

Implications verified by: **Lindsey Marks**
Principal Solicitor Children's Safeguarding

There are no direct legal implications to this report. Work experience is not a legal requirement for schools and colleges but is covered by good practice guidance on the on 16-19 study programmes: work experience last updated on 17 March 2015 and published on the www.gov.uk website.

8.3 **Diversity and Equality**

Implications verified by: **Becky Price**
Community Development Officer

The quality of work experience opportunities for school-age children across Thurrock is variable. Opportunities to improve the offer are outlined in this report with specific support to the Youth Cabinet to enable young people to shape their own work experience in the future.

8.4 **<u>Other implications</u> (where significant) – i.e. Section 17, Risk Assessment, Health Impact Assessment, Sustainability, IT, Environmental**

9. Background papers used in preparing the report (including their location on the Council's website or identification whether any are exempt or protected by copyright):

- None

10. Appendices to the report

- Appendix 1 – Supporting Pathways to Work – Task & Finish Report

Report Author:

Kenna-Victoria Martin

Senior Democratic Services Officer

Legal and Democratic Services

Children's Overview & Scrutiny

Task and Finish Group

Supporting Pathways into Work for Young People

November 2015

Contents

Appendices

Chair's Introduction

Pathways into Employment are vital – this initiative can break issues such as generational poverty and help to drive forward the future economy that we all rely on.

Growing up in Thurrock is a great privilege when you consider not just our regeneration opportunity verses relative affordable property prices of being a home county, but our proximity to our capital that boasts a world of employment as one of the world's leading cities. Thurrock students live in an area of great opportunity, it is our role as civic leaders to ensure that this opportunity is unlocked and therefore this working group was formed. Thurrock students deserve far more than a work experience placement that entails "making the tea, for the guy who makes the coffee".

Work experience provides not just a vital insight into employment, but can also provide valuable perspective for students as they select the options and courses that will affect their education and life. In addition, work experience at a young age can provide important grounding into good professional habits. It is clear that if these ideas are put across for students at a younger age, they will better help individuals shape decisions and encourage positive outcomes. It is not the case that work experience should be consigned to post 16 education.

The aim of this report is to refocus on work experience. Due to the fact that it is not mandatory and that it is not given a final academic grade, it has been seen as less essential. By holding up examples of best practise and praising great offers in the Education awards, we can share ideas. By helping students shape their own experience and by offering great work experience packages as an award for contributions to Thurrock, we can encourage a borough wide conversation about its relevance - if it is done well! By making sure we talk to parents about unique offers in schools so they can hold them to account, we can ensure that no provider overlooks this key work.

This report, I hope, will launch a renewed appreciation for good work experience and how we must stick to its improvement in order to make that vital link between Thurrock students and Thurrock's potential.

Councillor James Halden
Chair of Supporting Pathways into Work for Young People

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Introduction

The topic of Supporting Pathways into Work for young people was brought to the fore by the Children's Services Overview and Scrutiny Committee, which wanted to explore and investigate the support given to young people seeking Work Experience by both Thurrock Council and its partners.

The Aim of the Supporting Pathways into Work for Young People Task & Finish Group:

"To examine how Thurrock Council and its partners currently support young people into the workplace, particularly through teaching employability skills in education and the work experience offer in Thurrock. The group will make recommendations on how value can be added to the current offer."

What is Work Experience?

The term 'work experience' generally refers to a specified period of time that a person spends with your business, during which they have an opportunity to learn directly about working life and the working environment.

Some work experience positions offer people the chance to try their hand at particular tasks, others simply provide an opportunity to watch and learn. The nature, length and arrangements for work experience vary.

Membership of the Review Panel

Councillor James Halden (Chair) – Conservative
Councillor Steve Liddard– Labour
Councillor Graham Snell – UKIP

Terms of Reference

We agreed that our key aims were:

1. To build a clearer picture of the realities of work placements in Thurrock and evaluate how young people are being equipped with the necessary skills to enter the workplace.

2. To examine how Thurrock could increase the employability skills of young people of secondary school age in Thurrock so that they are ready for work.

3. To review the quality of work experience placements in Thurrock and identify opportunities for improvement.

4. To consider how Thurrock could increase the number of young people who are undertaking work experience placements of some form at Key Stage 4/5.

5. To liaise with key stakeholders to evaluate the effectiveness of current work placement and employability skills education in schools at preparing young people for the local workplace.

6. To engage with local employers and industry leaders to determine how Thurrock can better support young people into the workplace.

7. To produce a report of findings in respect of current strategies and make recommendations on how value can be added to the current offer, feeding in the outcomes of the review to existing action plans and the work of the Thurrock Education Alliance

Issues in- Scope

There will be 2 specific areas examined as part of this review:

1) Employability Skills in Schools
2) Work Experience

These areas have been identified as where a review could add most value and avoid duplicating other work already underway.

Employment skills

The types of employability skills that will be considered are:

- Confidence building
- Reading, writing and numeracy skills
- Financial understanding
- Personal development
- Self-responsibility/attitude/work ethic

Key issues

- Is there a shared understanding of what is meant by employability skills?
- What is the baseline for current levels of employability skills?
- What is the ambition/goal for levels of employability skills?
- How do we measure employability skills?
- What type of community work can help provide employability skills?
- What is the role of schemes such as – Duke of Edinburgh in helping
- young people to be ready for work?
- What is best practice nationally?

Work Experience

This review could explore how to encourage schools, parents businesses and young people to undertake work experience of some form. This may explore the different types of work experience beyond the traditional 2 week block placement at KS4.

Key issues:

- What is the evidence of the benefits of work experience placements?
- How can schools, parents and young people be convinced of the
- importance of offering their students the opportunity of work
- experience?
- Are there alternative forms of work experience placements that are
- more flexible that can be provided?
- How can the Council & partners assist with this?
- What are trends nationally?

This review could feed into the action plan for delivery of the 'Ambition, Achievement and Aspiration' Strategy developed as part of the Thurrock Education Alliance work, arising from the Education Commission report, published in 2013.

Key stakeholders

- Secondary Schools/Academies
- Palmers College & South Essex College
- Job Centre Plus
- Thurrock Careers
- Learning & Skills Team
- Voluntary and Community Sector
- LEP – Employability and Skills Sub-Group (led by Essex County Council)
- 11-19 Strategy Group
- Children and Young People's Partnership
- Youth Cabinet

Activity Timeline

(subject to change as review progresses)

The group undertook the following activities to reach their recommendations:

End of November 2014/ Early December 2015	Group Leaders to nominate Members to the Task & Finish Group.
January 2015	Officers to conduct research and prepare information pack for Members. .
February 2015	Receive and scrutinise information pack. Agree Terms of Reference
March/May	Evidence gathering with key stakeholders. Organise Stakeholder event include Portfolio holder witness session.
August 2015	Gather and review evidence and make recommendations. Final meeting of review panel to prepare final report for Overview and Scrutiny Committee.
November 2015	Report back to Children's Overview and Scrutiny

The activities undertaken were prepared and presented to the group at their meetings to enable all parties to participate in discussions and agreed to a way forward.

Work Experience

Work experience has undergone significant change over the last four years. With a change of central government the statutory duty to provide work experience was removed and schools were given the opportunity to decide whether to continue with work experience or remove it from the timetable for young people aged 14-19.

The decision to remove the duty to provide work experience was based to a certain extent on an independent review carried out by Professor Alison Wolf (2011). The review identified that there was little evidence of work experience (for 14-16 year olds) having a positive impact in supporting the progression of young people into employment. However, the report did conclude that “genuine work experience” for 16-19 year olds had significant benefits in preparing young people for the challenges of work and enabled employers to identify young people with talent for their organisations.

Thurrock, like many other Local Authorities, saw a very mixed picture emerge, with some schools continuing to offer work experience and others offering alternative work related activities – some of which included placing a charge on parents who requested a work experience placement to pay for the mandatory health and safety checks for any work experience placement a young person undertakes.

In September 2013, the provider of work experience opportunities in Thurrock went into receivership. The Learning and Skills team in the Council were approached by the Principal of The Ockendon Academy to offer work experience opportunities as part of an emerging traded offer to schools which includes impartial information advice and guidance and support to recruit apprenticeships and other work related activities.

In response to this request, Thurrock Council has provided Health and Safety assurance for students to participate in work experience placements for the past year. This activity provides a source of income to Thurrock Council and enhances the school curriculum to prepare local young people for employment. Eleven institutions commissioned the work experience service in its first year (13/14). It is anticipated that 14 institutions will be utilising the service from September 2014.

The latest guidance released around work related activities states

‘*’Work experience is vital for young people and employers. It bridges the gap between school, college and work, helps young people make decisions about their future and develop new skills, and gives employers the chance to spot good new recruits’’*.

Skills Minister, Matthew Hancock October 2013

This support for work experience has been welcomed and echoed by local employers who have stated that they identify potential apprentices from the young people who undertake work experience within their companies.

What does Thurrock do?

The Learning and Skills team provides a service to local Young People as follows:

1. Works with partners to design/deliver short programmes to enable lower skills Young People to prepare for apprenticeships. The short programmes range from 2-12 weeks and comprise sector specific training, employability skills training and work placement that should lead to employment. The programmes delivered over the past six months+, have focused on Thurrock's key priority sectors. NEET Young People feedback that they are unable to afford to engage on the programmes on account of transport and food costs. We secured payment of transport and food on some of the programmes which slightly increased participation and outcomes.

2. Provides 1-1 support to Young People with the delivery of employability skills training. We work on their CV, job applications, practice interview skills and provide support until they secure employment with training, this can include volunteering.

3. Works with schools and employers to create meaningful work experience placements for Young People. A suite of documents is provided to each school/academy to enable robust documentation for Ofsted to measure quality of the experience.

4. Provides 1-1 support for care leavers (16-24 years) to move into full time education or apprenticeships. This includes the delivery of literacy, numeracy, employability and life skills training before work experience placements/volunteering and ultimately secure employment. An effective cross directorate partnership reviews progress/services being accessed, every two weeks. Since Apr 14, 5 care leavers have secured employment (they continue to receive support so this is sustainable).

5. We work closely with partners to create internships for local LDD residents (16-24 years) that are keen to be employed.

6. Thurrock Careers deliver information, advice and guidance to Young People to secure employment.

7. Youth Activities deliver informal sessions to engage the disengaged. During these sessions, they are helped to understand their motivations, how to make positive changes, develop aspirations to succeed++

8. In addition, we work with employers to create apprenticeship placements. We remove as many barriers as possible for employers to recruit local people by writing role desc/person specs, adverts, advise on apprenticeship frameworks, training providers, success rates, delivery models, provide CV's, sifting service or support on interview panels, advice on wage subsidies etc.

9. We have secured a Partnership Agreement with JobCentre Plus to reduce NEET in Thurrock.

Institutions choosing Thurrock for Work Experience

There are currently 508 students placed or waiting to be placed via Thurrock Council's Support Programme. These placements are shown within the table below and broken down via each organisation.

Institutions	No. of students placed (or to be placed)
Ormiston Park Academy	22
The Ockendon Academy	180
Ockendon Studio School	38
William Edwards School	9
St Clere's School	190
Princes Trust	42
Pupil Support Service	7
Gable Hall School	6
Stanford and Corringham 6th Form	14

Achievements to date

- Promotion of the service at partnership meetings has resulted in more take up of the service.

- A set of documents to enable education institutions to provide (and evidence to Ofsted) outcomes.

- Utilising a work experience student at Thurrock Council to enhance the content of the student forms.

- Efficient and effective communication between the Work Experience Co-ordinator and partner contact

- Approximately 280 local employers regularly provide work experience placements, across all sectors.

- Thurrock Council leading the way in providing work experience placements in a range of different directorates.

Challenges for Thurrock

- Thurrock Council being reliant on one person to provide assurance for work experience placements

- Clashing work experience dates between institutions

- Continual need to promote and secure a range of placements as demand grows

- Sector specific engagement e.g. more opportunities in logistics sector to take advantage of the regeneration opportunities locally.

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The Results from the Task and Finish Group

Participants included representatives from Educators, the Youth Cabinet, senior officers and Members. It was discussed at the first meeting the support offered by that the Council and its Partners and these were presented to Members within the information pack.

During the first meeting in February 2015, it was decided that the Chair should write to certain schools and businesses that offered the most diverse view of the local education/employment market to gather evidence regarding local provision. The partners written to were – The Port of Tilbury, High House Production Park, DP World, Lakeside, Palmers College, Gable Hall, the Gateway Academy, Grays Convent, and the Ockendon Academy

Throughout both meetings of the Review Panel, open conversations took place on the types of Work Experience and Work Placements on offer to young people within borough in relation to Work Experience. The Panel extended invitations to educators and local businesses

Following meetings of the Review Panel the following key points were identified:

- Schools responded positively; from Palmers sending their Deputy Head in person, Grays Convent writing in, and Gable Hall Head Dr Asong talking on the phone with the Chair.
- The business feedback was very disappointing with no one responding formally. It was suggested that not only to write back to these businesses, but to also approach them in person where possible;
- Following discussions with the Youth Cabinet it was felt the issue of work experience ranked top as an important issue effecting young people 2 years in a row. The desire for quality work experience amongst young people was clear;
- The Review Panel felt that the offer of Work Experience should be included as part of the information that parents and students are given at the admissions stage;

Suggested Recommendations

The aim of this review was to look at ways young people within the borough were supported in the workplace.

The Review Panel considered the following recommendations:

Recommendation One

It was identified that by including the types work experience was offered by schools at the admission stage may assist parents and students when deciding amongst which schools to visit and apply for.

Recommendation 1:
That work experience offers became a part of the published admissions information given to parents and students when deciding upon a school.

Recommendation Two & Three

Recommendation 2:
Work experience quality to become a part of the education awards and the business awards.

Members felt that schools and colleges who offered quality work experience to students should be acknowledged, supported and awarded for their work.

Recommendation 3:
Thurrock Council offers a small amount of premium provision work experience places as a part of a Borough wide award for young people's community service

Recommendation Four

Recommendation 4:
Youth Cabinet and Thurrock Youth Services to support schools and young people who wish to shape their own work experience offer.

The Review Panel agreed that having spoken with Members of the Youth Cabinet and hearing of their experiences; that they would be the best people to support their peers when it came to deciding what type of work experience to undertake.

Recommendation Five

It was anonymously agreed by the Review Panel that Thurrock Council work with its partners at Ensign Buses and C2C in relation travel costs of work experience.

Recommendation 5:
Thurrock Council continues to work with Ensign Buses and C2C regarding the associated travel costs of work experience.

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Appendix 1

Notes of the meeting of the Supporting Pathways into Work for Young People Review held on 24 February 2015 at 7.00pm

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Present:	Councillors James Halden and Graham Snell.
Apologies:	Councillors Simon Wootton and Steve Liddiard
In attendance:	James Henderson – Youth Cabinet Representative Sue Davis – Assistant Principal, Palmers College Kenna-Victoria Martin – Senior Democratic Services Officer

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Before the start of the Meeting, all present were advised that the meeting may be filmed and was being recorded, with the audio recording to be made available on the Council's website.

1. Election of Chair

Councillor Halden accepted the role of Chair of the Pathways into Work for Young People Review panel

2. Items of Urgent Business

There were no items of urgent business

3. Declaration of Interests

There were no declarations of interest; however Councillor Halden informed those present that his sister was a member of the William Palmer Trust.

4. Terms of Reference

Members noted the terms of reference.

RESOLVED:

That Members of the Supporting Pathways into Work for Young People Review agree the terms of reference as set out within the agenda.

5. Consideration of Information Pack

The Chair of the Review Panel lead the discussion, informing those present that the idea to carry out an in-depth piece of work was thought of by the late Councillor Hale. It was explained that the Task and Finish Group was agreed at the November meeting of the Children's Services Overview and Scrutiny Committee and it was felt that it was important to have Members of the Youth Cabinet involved as they could provide firsthand accounts as to the work placements they had experienced.

Members carried on with discussions and panel considered Logistical issues, for example it was mentioned that Ensign Bus produced a student travel card and communication skills, it was discussed how unfortunately it seemed that young people lacked written communication skills which ended up with bad grammar. The Panel thanked officers for the work put into producing the information pack, however asked that financial information be included within any further reports as it mentioned within the pack that some work placements may occur a charge.

During discussions the Review Panel was informed of the work that Palmers Sixth Form College do to support their students, once students left the college, staff at Palmers contact students to find out what they are doing since leaving college, whether it was confirming the university they had been accepted into or the job they have secured.

It was agreed by all, that work placements needed to be meaningful, so that students actually learned as to whether they felt the career choice was for them and were not just required to carry out filling jobs. The Panel further discussed challenges that they may face and it was highlighted that it was important to manage the skills that students and young people learnt to enable them to transfer their skills into the work place.

The Assistant Principal of Palmers Sixth Form College informed the Panel that the College held career fairs, where they invite local business as well as law firms based in London. Members were advised that students were

encouraged to stop, talk and engage with people from the different firms to gain a better understanding of what they could expect from working within the different industries.

RESOLVED:

That Members noted the Information Pack.

6. Witness Day

The Review Panel discussed the possibility of holding two witness sessions, one for employers to see the skills that they require from young people joining the work place and the second with educators to find out what skills are being taught to young people.

Members highlighted the businesses and educators they wished to contact, to explain as to what it was they were investigating and to seek feedback as to what they do. The organisations were:

- Port of Tilbury
- High House Production Park
- DP World
- Lakeside
- Palmers Sixth Form College
- Gable Hall
- The Gateway Academy
- Grays Convent Secondary School
- Ockendon Academy

RESOLVED:

That the Chair of the Review Panel writes to local businesses and schools to seek feedback as to work placements.

The meeting finished at 7.50.

Approved as a true and correct record

CHAIR

DATE

Any queries regarding these Minutes, please contact

Democratic Services at Direct.Democracy@thurrock.gov.uk

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Appendix 2

Grays Convent High School - Supporting Pathways into Work for Young People.

Transferable skills and employability skills taught at Grays Convent School (we have students aged 11-16)

We follow the National Curriculum and therefore cover the following transferable skills particularly within PSHEC and Careers sessions. Students use the National Careers Service website.

- Communication
- Leadership
- Organisation
- Problem-solving
- Teamwork
- Using initiative
- Taking risks
- Adapting to change
- Handling uncertainty
- Financial capability
- Confidence
- IT skills
- Creativity
- Public speaking
- Negotiation

Employability skills

- Application of ICT
- Self-management
- Business awareness
- Problem-solving
- Communication
- Literacy
- Teamwork

These are embedded into most subjects i.e. in English, students prepare and deliver presentations taking into account the needs of the audience and in Mathematics students tackle real life financial problems.

In addition, as a faith school we carry out a considerable amount of charity work whereby students plan an activity, promote it and raise the money. They also plan and deliver Masses and Assemblies.

In terms of Careers Information and Guidance, we have an external Careers Adviser for 2 days per week. Students have experience of the following:

Year 8

Initial thoughts about your future and possible careers.

Year 9

Use of diagnostic careers software and advice regarding options. Personal careers interviews take place. Involvement in Thurrock's Next Top Boss.

Years 10 & 11

Personal interview by the external careers adviser, introduction to the National Careers Service, mock interview day and preparation of CVs (external local businessmen and business women interview our students), recognition of transferability of skills. All our Y10 students attend the Opportunity Thurrock event.

Work Experience

We do not currently have students participating in work experience due to the rise in the age that students can take up paid employment and the pressure to ensure all students achieve the best GCSE grades possible.

Duke of Edinburgh Award

We have a large number of participants who greatly benefit in term of their development of problem-solving and teambuilding skills. Many achieve Bronze Award and some go on to Silver.

Appendix 3

Palmer's College – Supporting Pathways into Work for Young People.

Through the use of employability skills framework students are provided with the opportunity to develop their attitudes, skills, knowledge and experience in preparation for entering the workplace.

Attitudes

Self-perception - Motivation, confidence, positive attitude, self-belief, pride, positive body language, self-expression and willingness to learn. Opportunities to develop these skills are provided through activities such as: weekly tutorials, group events/activities, 1:1 meetings with tutors, preparation for employment workshops and briefing for students/parents, work experience, volunteering, mentoring programmes, and following the college behavioural policy – Respect, Effort, and Pride.

Attitude towards progression- demonstrating an understanding of career options, progression routes, and job roles that are connected to or relevant to vocational and academic subjects, showing aspiration, motivation to progress, setting career goals, enhanced awareness of job market, willingness to seek advice and guidance. Opportunities to develop these attitudes arise through careers events (internal and external) careers tutorial sessions, preparation for employment workshops and briefing for students/parents, work experience, volunteering, guest speaker programmes, industry visits. 1:1 meetings with careers staff and through the college Work Experience/Volunteering/Employer Engagement Team.

Skills

Self-Management - skills including the ability to manage time effectively, dress and behave appropriately, accept responsibility, monitor and evaluate progress, set goals, be punctual and reliable, overcome challenges, take constructive feedback, demonstrate flexibility. Opportunities to progress these skills are provided through activities such as the college daily schedule, practical activities, preparation for employment workshops and briefing for students/parents, lessons, trips and visits, work experience, volunteering, 1:1 tutor mentoring, Student Support Services, Trips and visits, guest speakers, Your Life Fair.

Problem Solving Skills- use of creative thinking to develop solutions, generate ideas, analyse facts and situations, identify problems, find creative solutions, prioritise, plan, reflect and use initiative. Opportunities for development arise through team building activities, lesson activities, trips and visits, work experience,

volunteering, meeting coursework deadlines, self-study, seeking help where appropriate.

Team Working – demonstrating awareness and respect of others including the ability to listen, contribute and provide feedback, leadership, co-operation, negotiation, diplomacy, working towards a common goal, peer feedback and constructive feedback. Opportunities to develop these skills arise through lessons, workshops, practical team building activities, work experience, volunteering, Voluntary Service programme, clubs and activities, team games.

Knowledge

Practical use of Maths – able to represent, analyse and interpret a situation using maths including use of calculating, estimating quantities, relating numbers in a business context and applying formulae. Opportunities for development provided through workshops and competitions, tutorials and lessons highlighting the practical use of maths in the working world.

Practical use of ICT – Use of a range of ICT systems to find, select, develop and present and communicate information including use of word processing, spread sheet packages, the internet, file management, telephones and mobile devices. Opportunities for development include workshops, tutorials, use of ICT suite, production of coursework, tutorials and lessons highlighting the practical use of ICT in the working world.

Communication and Literacy - communication skills including oral presentation, verbal understanding, following instructions, writing accurately, comprehension, writing clearly, presenting facts orderly and questioning. Opportunities for development include workshops, tutorials, team working activities, guest speaker and network meetings, preparation for employment workshops and briefing for students/parents, clubs and activities, team games, enterprise events, careers fairs (internal and external), CV workshops and 1:1 sessions, interview skills workshops and mock interviews, work shadowing, work experience, insight days, volunteering, Voluntary Service Programme, Your Life Fair, production of coursework, tutorials and lessons highlighting the practical use of literacy in the working world.

Business Awareness – understanding the key drivers for business success such as profit, recognising needs of customer, customer service. Opportunities provided through guest speaker events, workshops, careers events lessons, enterprise activities, preparation for employment workshops and briefing for students/parents.

Experience – Students have the opportunity to improve their attitudes, skills and knowledge through experience gained by participating in:

- Competitions
- Enterprise events
- Guest Speaker Programmes
- Lessons highlighting numeracy/literacy and employability skills
- Trips and visits
- Independent Volunteering opportunities (regular on-site presence of local volunteering agency)
- College Voluntary Service Programme
- Course related work experience programmes including 2 week placements/ one day per week placements/ ½ day placements/ holiday work experience programmes/ paid work during summer holiday period.
- Part-time jobs
- Internal and external Careers events
- Independent work experience opportunities
- Employability skills workshops
- Guided tutorials
- Team working events
- Preparation for employment workshops and briefing for students/parents
- Work shadowing and insight days
- Mentoring programmes
- Employer recruitment presentations and workshops

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Appendix 4

Minutes of the Meeting of the Supporting Pathways into Work for Young People Review Panel held on 27 August 2015 at 7.00 pm

Present:	Councillors James Halden, Steve Liddiard and Graham Snell
In attendance:	Sonny Tipping, Representative of the Youth Cabinet
	Sophie Bourne, Representative of the Youth Cabinet
	Georgina Contreras, Representative of the Youth Cabinet
	Patrick Kielty, Participation Officer
	Michele Lucas, Learning & Skills Manager
	Kenna-Victoria Martin, Senior Democratic Services Officer

Before the start of the Meeting, all present were advised that the meeting may be filmed and was being recorded, with the audio recording to be made available on the Council's website.

1. Minutes

The Minutes of the Supporting Pathways into Work for Young People Review, held on 24 February 2015, were approved as a correct record; subject to the correction of a typographical error.

2. Items of Urgent Business

There were no items of urgent business

Councillor Halden informed the Panel that although they had received feedback from the Schools they had send correspondence too; the Panel had not received feedback from the businesses within the borough. He continued by asking the Panel if they felt it would be necessary to have comments from the business.

It was commented by Councillor Snell that he felt it was important to hear back from businesses and for them to contribute to the Panel as young people undertaking work experience were the future employees of local businesses.

The Panel agreed to contact the four businesses again to seek their feedback as to what skills they look for when taking on students for work placements. Members of the panel also agreed to contact different business personally to enquire how they support work placements and what they look for when employing students for work experience.

3. Declarations of Interest

There were no declarations of interest.

4. Feedback from Educators

The Chair of the Review Panel opened the item for debate and comments from those present, by asking for clarification on what was meant by “We do not currently have students participating in work experience due to the rise in the age that students can take up paid employment and the pressure to ensure all students achieve the best GCSE grades possible” from the feedback received from Grays Convent.

The Learning & Skills Manager explained that the government had commissioned Professor Alison Wolfe to look in to work placements. A report was realised which stated that work experience was better suited for post 16year olds and did not truly benefit young people prior to 16 years old. However there were a range of schools within the borough who encouraged their students to embark on work experience.

RESOLVED:

That the feedback from both Grays Convent and Palmers Sixth Form College be included within the report from the Review Panel.

5. Discussion with Youth Cabinet

The Review Panel began discussions by enquiring as to whether it was felt that work experience or placements being offered were relevant for what young people wanted to do.

A representative of the Youth Cabinet started by informing the panel that she had not been offered to complete work experience as yet and she had recently finish year 10. She stated that having GCSEs even if they were all A* were not necessarily going to assist young people when looking for employment as they were asked what if any, experience they had.

It was discussed that young people completing work experience were given the opportunity not only to put their skills they had learnt at school into practice but

also to learn life skills such as professionalism, time keeping skills and working with adults; by learning these skills would assist with boosting confidence within young people.

The Learning & Skills Manager informed the panel that Thurrock Council worked hard with different employers and as an employer to get the most out of work experience for young people.

Councillor Halden suggested that it may be an idea to include the types of work experience schools offered as part of their admission criteria. This would give parents the option to take work experience into account when looking at secondary school places.

Representatives of the Youth Cabinet highlighted to those present that work experience also taught young people independence; as they didn't have their peers with them. It was explained that at school it was easy seek advice from friends and to ask them for the answers, were as during a work placement you would have to use your own incisive when working on a project.

Councillor Liddiard enquired as to whether young people were inspired to work in the city, as London was only a half an hour train journey away from the borough. He continued by stating that the type of work experience on offer would be different from what was offered locally. Representatives of the Youth Cabinet notified Members that within schools young people were being asked why they would want to work away from Thurrock when there was so much going on to promote the borough.

The panel were advised that it would be helpful for students to be informed of other areas around the borough for example Southend-On-Sea; as this could them to make an informed decision and assist when making the decision of where to complete any work placements.

The Chair of the review panel, sought as to whether it would be possible to include awards for those who completed work placements to an exceptional standard with the Educational Award or if Thurrock Council could hold awards for young people as well as local businesses should they secure apprenticeships or work from completing their work placement.

During discussions it was debated as to if schools set students a project at the beginning of year 10 to find their own work experience with steps to follow; whether it would encourage young people to take responsibly for their work placements. The Learning & Skills Manager contributed to the discussion by informing those present that some schools already encourage their young people to seek their own work placements; this was usually through parents or family friends.

The Youth Cabinet Representatives indicted that setting a project for students to find their own work experience had the potential to work as students were used to working to deadlines for coursework. It was further highlighted that it would be useful for young people if they had someone to talk to who could inspire them as they would have already completed work experience themselves.

The Review Panel were notified that the Learning & Skills, School Improvement team travelled all over the borough and London completing Health and Safety checks of all work experience placements and a lot of the schools were also involved in Thurrock next top boss.

Representatives of the Youth Cabinet agreed that however a package of work placements were organised, all schools should provide the same opportunities to young people; instead of their being a mix of school that do or do not carry out work placements.

RESOLVED:

That the suggestions following the Review Panels discussion be included within the report which is taken back to the Children's Services Overview and Scrutiny Committee.

6. Next Steps

Councillor Halden suggested that following the Review Panels discussions the points highlighted should be considered as recommendations for the main report:

- That Schools work experience programmes be included as criteria at an Admission stage;
- That awards be given at the Education Awards for Schools and businesses who offer work experience and for supporting students throughout the process;
- That Thurrock Council seek to organise a scholarship to support young people undertaking work placements.

It was agreed by Members that the report of the Review Panel be scrutinised by the Youth Cabinet prior to it being presented at the October meeting of the Children's Services Overview and Scrutiny Committee.

RESOLVED:

That the report of the Review Panel be considered at by the Youth Cabinet at their meeting on Wednesday 7 October prior to it being presented to the Children's Services Overview and Scrutiny Committee.

The meeting finished at 8.13 pm

Approved as a true and correct record

CHAIR

DATE

Any queries regarding these Minutes, please contact

Democratic Services at Direct.Democracy@thurrock.gov.uk

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13 January 2016	ITEM: 12 (Decision 01104340)

Cabinet

Determination of The Collection Fund Balance 2015/16 and Setting of the Council Tax Base for 2016/17.

Wards and communities affected:	Key Decision:
All	Key

Report of: Councillor John Kent, Leader

Accountable Head of Service: Sean Clark, Head of Corporate Finance

Accountable Director: Lyn Carpenter, Chief Executive

This report is Public

Executive Summary:

The Collection Fund regulations require a local authority to estimate the balance on its Collection Fund as at 31 March each year. Any such balance relating to Council Tax is to be distributed to/borne by the Council and the Essex Police and Fire Authorities in proportion to the value of their respective precepts.

Any such balance relating to Business Rates is to be distributed to/borne by the Council, Central Government and Fire Authority in proportion to the agreed split under regulations.

This report also sets out the number of properties within Thurrock that are chargeable for Council tax and classifies them into Band D equivalents for budget setting purposes.

1. Recommendation(s)

1.1 (a) Determines the estimated 31 March 2016 balance of the Council Tax Collection Fund to be a surplus of £1,199,312 (before distribution to major precepting authorities).

(b) Allocates the surplus to the three main precepting bodies in proportion to their precepts for 2015/16 as follows:

i) Thurrock Council £1,007,909;
ii) Essex Police Authority £131,877; and
iii) Essex Fire Authority £59,526.

1.2 That the Cabinet recommend to Council that it:

(a) Determines the estimated 31 March 2016 balance of the Business Rate Collection Fund to be a deficit of £5,761,084 (before distribution to Central Government and Essex Fire Authority).

(b) Allocates the deficit to the three main precepting bodies in the proportion set out in legislation:

(i) Thurrock Council £2,822,931;
(ii) Central Government £2,880,542; and
(iii) Essex Fire Authority £57,611.

1.3 To recommend that Council set the Council Tax base for 2016/17 by approving the following resolutions:

(a) that the report of the Head of Corporate Finance for the calculation of the Council's Tax Base for the year 2016/17 be approved; and

(b) that pursuant to the Head of Corporate Finance report and in accordance with the relevant regulations, the amount calculated by Thurrock Council as its Council Tax Base for the year 2016/17 shall be 48,856.

2. Introduction and Background

Determination of Collection Fund Balances

2.1 This report sets out the information required for Cabinet to recommend to Council:

- the determination of the estimated balance of the Council Tax Collection Fund that will be apportioned between the Council and the major precepting authorities (the Police and Fire Authorities); and

- the determination of the estimated balance of the Business Rate Collection Fund that is apportioned between the Council, Central Government and the Fire Authority in accordance with regulations.

The Council's Constitution does not delegate this determination to Cabinet or any officer and so requires a decision from Council.

2.2 Each billing authority is required to maintain a separate Collection Fund which shows its transactions in relation to business rates and council tax and illustrates the way that these have been distributed to preceptors and the General Fund.

2.3 The key reasons for balances arising on the Collection Fund are:

- The estimated Council Tax Base will differ from the actual position throughout the year. The Council Tax Base comprises of the number of properties, the number of voids and the various discounts and exemptions awarded, it is inevitable that these will change and that a difference will arise;

- The Business Rates estimated at the start of the year and any predicted growth in those rates may differ from the actual amounts collectable from business rate payers, mainly as a result of growth and business closures; and

  The Collection Fund also includes contributions to the bad debt provisions for Council Tax and Business Rates which are reassessed each year.

2.4 Council Tax billing authorities are required by the Local Authorities (Funds) (England) Regulations 1992 to estimate any surplus or deficit on their Council Tax Collection Fund for the year as at 15 January every year and, at the same time, apportion such amount between themselves and the major precepting authorities.

2.5 Billing authorities are required by the Local Government Finance Act 2012 to estimate any surplus or deficit on their Business Rate Collection Fund for the year as at 15 January every year and, at the same time, apportion such amount between themselves and the major precepting authorities in accordance with regulations. This is then notified to central government through the NNDR 1 form which will be issued in due course. This will be populated using the data supporting the position included in this report and will form the calculation of available resources to be included in the final budget proposals.

2.6 Based on the latest forecasts of collections and write offs the Council Tax Collection Fund is estimated to be a surplus of £1,199,312 as at 31 March 2016. This is apportioned to the major preceptors as follows:

Major Precepting Authority	**£**
Thurrock Council	1,007,909
Essex Police Authority	131,877
Essex Fire Authority	59,526
Total Allocated	1,199,312

2.7 The Council's share of the balance is a surplus of £1,007,909 which needs to be taken account of in the budget for 2016/17 and has been included in the MTFS.

2.8 Based on the latest forecasts of collections and write offs the Business Rates Collection Fund is estimated to have a deficit of £5,761,084 as at 31 March 2016. This is apportioned under regulations as follows:

Major Precepting Authority	£
Thurrock Council	2,822,931
Central Government	2,880,542
Essex Fire Authority	57,611
Total Allocated	5,761,084

2.9 The Council's share of the balance is a deficit of £2,822,931 which needs to be taken account of in the budget for 2016/17 and has been included in the MTFS.

2.10 The cause of the ongoing deficit on the fund was the provision for the impact of appeals lodged with the Valuation Office. The impact of specific appeals on the Council's resources is a one off charge linked to the refund of backdated appeals and then an annual reduction going forwards. The Council's share of these charges is 49% with the remaining share split between Central Government (50%) and Essex Fire Authority (1%). The reduction in business rates income in the Collection Fund was £14.8m between 1 April 2013 and 31 March 2015. This reduced Council income by £7.3m in this period.

2.11 There is a specific emerging issue in regard to the treatment of purpose built GP surgeries. A legal ruling meant further provision has been made for appeals received in respect of these properties. This could result in a backdated one off charge to the Collection Fund of up to £2.1m with an ongoing cost of up to £0.36m per annum. The impact on the Council would be a one-off charge of up to £1.03m with an ongoing cost of £0.176m.

2.12 This report is also one of the components required for the setting of the 2016/17 budget and Council Tax. It does not fix the Council Tax rate. This will be decided as part of the 2016/17 Budget reports, which will be considered in February 2016. The Council's Constitution does not delegate this determination to Cabinet or any officer and so requires a decision from Council.

The Council Tax Base Calculation

2.13 The Valuation Officer of the Inland Revenue (called the Listing Officer for Council Tax purposes), places each property in the Borough in one of eight valuation bands. Each band relates to the estimated capital value of the property as at 1st April 1991. Examples are that the lowest band (A) covers properties that were then up to a value of £40,000 whereas the highest band (H) covers all properties which then exceeded £320,000 in value.

2.14 Having done this, the Listing Officer produces a Valuation List, which shows the band allocated to each property. The individual properties are then added together to produce the total number of properties in each band and the total of all properties in the Borough. The current list for this Authority gives the following results

BAND	NUMBER OF PROPERTIES
A	7,360
B	13,142
C	26,366
D	11,481
E	4,440
F	2,079
G	784
H	41
Total	**65,693**

2.15 From this it can be seen that 71.3% of Thurrock properties are in Bands A-C.

2.16 Each band will be charged a different amount of tax. The proportion payable by each band is laid down by statute. A Band D property was taken as the national average and occupants of these properties will therefore pay the base rate of tax. Lower banded properties pay less (Band A properties pay two thirds of the Band D rate) while higher banded properties pay more (Band H properties pay twice the Band D rate).

2.17 As required, the full calculation of the tax base is set out in Appendix 1 to this report.

The Final Calculation

2.18 2013/14 saw the introduction of the Local Council Tax Scheme (LCTS) that required those of working age that were in receipt of Council Tax Benefit to now have to pay a minimum of 25% of the annual charge. As this applies to the more vulnerable sections of the community, it is not surprising to see lower rates of collection from this group. On non LCTS bills, the Council is collecting circa 99%. Adjusting for LCTS, it is prudent to set an overall collection rate of 98.75% and so account for a lower collection rate for this group. After this and other adjustments have been made, the final tax base would look as follows:

BAND	NUMBER OF PROPERTIES
A*	4
A	2,902
B	7,474
C	19,311
D	10,139
E	4,971
F	2,815
G	1,211
H	29
Total	**48,856**

A* is Band A properties entitled to Disabled Relief reduction.

3. Issues, Options and Analysis of Options

3.1 A key issue in this report is the accounting for the levels of business rate appeals that are with the Valuation Office. The calculation includes a provision for an increase in business rates of an additional £0.43m in 2015/16 bringing the total provision to £15.26m. This is based on the levels of appeals waiting to be heard and an assessment of their likelihood of success. This figure could obviously change significantly and any variation would be accounted for in the setting of the 2016/17 budget.

3.3 The Council Tax base represents the Council's total taxable resources. A brief explanation of the method of calculation is given in this report. The full Council is required to make this calculation and, because it is also used by the Police and Fire Authorities to calculate the precept payable, the precepting bodies must be notified of the result before 31st January in each year.

4. Reasons for Recommendation

4.1 There is a legal requirement to agree the collection fund balance calculations and to include it within the budget setting process.

4.2 The Council Tax base must be set in accordance with legal requirements.

5. Consultation (including Overview and Scrutiny, if applicable)

5.1 There has been no consultation on this report.

6. Impact on corporate policies, priorities, performance and community impact

6.1 There is no direct impact from the content of this report that is not already being considered as part of the budget consultation.

7. Implications

7.1 Financial

Implications verified by: **Sean Clark**

Head of Corporate Finance

The Council's share of the Council Tax Collection Fund surplus is £1,007,909 and the share of the Business Rates Collection Fund deficit is £3,508,931. This has been considered in setting both the budget and MTFS.

A council tax base of 48,856 is an increase 967 over the 2015/16 council tax base of 47,889 that, at the level of the 2015/16 council tax, would raise an additional £1.09m. This increase has already been factored into the MTFS.

7.2 Legal

Implications verified by: **David Lawson**

Deputy Head of Legal and Governance

Council Tax billing authorities are required by the Local Authorities (Funds) (England) regulations 1992 to estimate any surplus or deficit on their Council Tax Collection Fund as at 15 January every year.

Business Rate billing authorities are required under the Local Government Finance Act 2012 to estimate any surplus or deficit on their Business Rate Collection Fund at 15 January every year.

The Council Tax base must be calculated in accordance with the Local Authorities (Calculation of Tax Base) Regulations 2003 and Section 33 of the Local Government Finance Act 1992.

7.3 Diversity and Equality

Implications verified by: **Natalie Warren**

Community Development and Equalities Manager

There are no equalities issues arising from this report.

7.4 **Other implications** (where significant) – i.e. Staff, Health, Sustainability, Crime and Disorder)

In terms of risk, the estimated Council Tax Base includes prudent assumptions about the Tax Base and changes in exemptions, voids, discounts and the provision for bad debts.

The assumptions underpinning the amounts of business rate collectable and any associated bad debt provision are also considered to be prudent.

8. Background papers used in preparing the report (including their location on the Council's website or identification whether any are exempt or protected by copyright):

- Statement of Accounts 2014/15
- Working papers retained by Corporate Finance

9. Appendices to the report

- Appendix 1 – Detailed calculation of the 2015/16 Council Tax Base

Report Author:

Sean Clark

Head of Corporate Finance

Corporate Finance

COUNCIL TAX BASE Year 2016/17

1	2	3	4	5	6	7	8	9	10	11	12	13	**14**
Band	Total Properties	No. of Discounts	Exempt Properties	Net Disabled Relief	LCTS	LT Premiums	Changes in Year			Sub Total	Total Band "D" Equiv	Adj for collection rate	**Tax Base (Rounded)**
							Estimated Discounts	New Properties	Demolitions				
		(-)	(-)	(+) or (-)	(-)	(+)	(-)	(+)	(-)			1.25%	
A *	0	1	0	9	1		0	0	0	7	4	0	**4**
A	7,360	1,056	132	17	1,842	9	0	53	1	4,407	2,938	37	**2,902**
B	13,142	1,367	160	84	2,072	11	0	94	1	9,732	7,569	95	**7,474**
C	26,366	1,839	239	-37	2,451	14	0	189	2	22,000	19,556	244	**19,311**
D	11,481	668	99	-39	495	6	0	82	1	10,267	10,267	128	**10,139**
E	4,440	201	39	-10	105	2	0	32	0	4,119	5,034	63	**4,971**
F	2,079	63	9	-13	36	1	0	15	0	1,974	2,851	36	**2,815**
G	784	41	4	1	12	2	0	6	0	736	1,226	15	**1,211**
H	41	13	1	-12	0	0	0	0	0	15	30	0	**29**
TOTALS	**65,693**	**5,248**	**683**	**0**	**7,016**	**43**	**0**	**472**	**6**	**53,256**	**49,474**	**618**	**48,856**

note A* is band A properties entitled to disabled relief reduction.

Column Key

1 Property Bandings
2 Total Number of Properties as per VO list
3 Ratio of properties receiving discounts relating to Single Persons and 1st disregard at 25% and Second Disregards at 50%, Class A at 50% and Class C at 100%
4 Number of Exempt properties by band inc. exemption classes B,D,E,F,G,H,I,J,L,N,R,S,T,V,W
5 Banding adjustments for Disabled relief
6 Ratio of Properties receiving CTS
7 Ratio of Properties charged 50% premium for long term empties
8 Forecast for increase/ decrease in discounts next year
9 Net estimate of new properties (Full year equivelants)
10 Net estimate of demolitions

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13 January 2016	ITEM: 13 (Decision 01104341)

Cabinet

Complaints Report – April 2015 to September 2015

Wards and communities affected:	Key Decision:
All	Non-key

Report of: Councillor Holloway, Portfolio Holder for Central

Accountable Head of Service: Jackie Hinchliffe , Head of HR, OD & Transformation

Accountable Director: Lyn Carpenter, Chief Executive

This report is: Public

Executive Summary

Corporate complaints:

- A total of 942 complaints have been received within the reporting period. For the same period last year this figure was 790.
- A total of 1353 concerns have been received in the reporting period. For the same period last year this figure was 1126.
- The combined total of complaints and concerns received for the reporting period is 2295. This period has seen an increase compared to last year, which had a combined total of 1916.
- The increase in complaints and concerns may be attributed to action the council have taken to improve customer access channels, in particular social media including Twitter. In addition to this the Complaints Team continues to promote in-house the need to ensure all types of customer feedback are recorded in line with process.
- Some services, by virtue of the nature of the type of service provided, receive the highest volume of concerns/complaints. For the reporting period, the top four expressions of dissatisfaction relate to the following services:
    - Housing repairs
    - Council Tax
    - Estate Management

- Missed Bins

- Detailed feedback on common types of complaints/trends is attached for each Directorate (as Appendix 1). This includes data on complaint outcomes and the learning which has been identified by either the service or the Corporate Complaints Team. A summary of Appendix 1 is shown below and work is on-going to undertake additional root cause analysis regarding these points:

    - Non-return of bins – There has been an increase in concerns received at the mid-year point for 2015/16 compared with full year volumes for 2014/15.
    - Environment (Customer Relations) – At the mid-year point for 2015/16, stage 2 complaint volumes are similar to the total received for 2014/15.
    - Repairs - 22% of concerns have escalated to a complaint.
    - Estate Management - A high % of stage 1 complaints are upheld.
    - Voids - At the mid-year point for 2015/16, the volume of concerns received are similar to the total received for 2014/15.
    - Voids - At the mid-year point for 2015/16, stage 1 complaint volumes are similar to the total received for 2014/15. Total concerns/complaints received in the reporting period (57) represents 16% against the number of voids completed (353).
    - Housing Benefits – A high % of stage 1 complaints are upheld.
    - Sundry Debtors - There has been a significant increase in stage 2 staff complaints received at the mid-year point for 2015/16, compared with full year volumes for 2014/15.
    - Appendix 1 also highlights the following:
        - Transforming Homes – A high % of stage 1 and stage 2 complaints are upheld, however the total number of concerns/complaints received in the period (66), represents 0.8% of the total contacts required (7775) to complete these works.
        - Repairs – A high % of complaints are upheld at stages 1 and 2. However, the total number of concerns/complaints received in the period (366) represents 1.8% of the number of repairs undertaken (20,294).
        - During 2014 Environment implemented the use of “Love my Street” and “My Account” as a mechanism for residents to use to report service requests and other types of customer feedback. Since April 2015, approximately 7000 service requests have been recorded via these channels. Due to this, there may be a significant number of concerns that have been reported via these channels of which the Corporate Complaints Team are not aware of. Environment are currently working with the Corporate Complaints Team to establish a

process of ensuring that all concerns/complaints reported via these channels are included within complaints reports going forward.

- Missed Bins - The concerns stage shows fewer complaints formally escalating which indicates they are being dealt with swiftly within the 5 calendar day timeline.
- Estate Management – The report highlights a significant reduction in concerns received compared with 2014/15.
- Repairs - The report highlights a significant reduction in concerns received compared with 2014/15.
- Repairs - The report highlights a reduction in stage 1 complaints received compared with 2014/15.
- Data quality – A reporting error (due to human error) has been identified regarding repairs complaints that were reported in the 2014/15 annual complaints report. The 2014/15 annual report highlighted that 580 repairs complaints had been received. This figure should have been 460.

- During the reporting period, 45% of complaints have been upheld. This is an increase compared with the same period last year which identified 42% of complaints as being upheld. A breakdown of upheld complaints at each stage is shown below and further root cause analysis will be undertaken on this with service areas:
    - Stage 1 - 53%
    - Stage 2 - 41%
    - Stage 3 – 19%

- For the reporting period, 98% of complaints were responded to in timeframe. This performance is encouraging when considered against the backdrop of the national austerity measures and the impact of reduced resources council-wide.

- A total of 208 MP/MEP enquiries were received (8 MEP), of which 97% were responded to within timeframe.

- A total of 1670 Members enquiries were received, of which 98% were responded to within timeframe. The average time taken to respond to members enquiries across all Directorates was 6 calendar days.

1. Recommendations

1.1 To note the statistics and performance for the reporting period.

1.2 To note that further work is on-going with a number of service areas to establish the root cause for concerns/complaints received, reasons for complaint escalation and reasons why complaints are upheld.

2. Introduction and Background

2.1 Back in September 2015, Cabinet requested a complaints report for consideration. This report sets out the council's complaints statistics for the first six months of 2015/16.

2.2 Adult's and Children's Social Care have separate statutory complaints procedures which are managed by the respective Directorates. However mid-year analysis for these areas is included within 2.9 and 2.10 below.

2.3 Directorate analysis of complaints has been produced and is attached as Appendix 1. This provides a high level summary of the top expressions of dissatisfaction and levels of escalation within the Directorates. Further work is on-going with a number of service areas to establish the root cause for concerns/complaints received, reasons for complaint escalation and reasons why complaints are upheld

2.4 Monthly cumulative reporting is issued to senior officers within Environment, Planning & Transportation and Housing Directorates in order for more detailed analysis to take place. The aim of which is to enable Directorates to identify any root causes and/or common themes, and to enable proactive steps to be implemented to improve the customer experience.

2.5 Ombudsman Enquiries

2.5.1 The table below provides a summary of formal enquiries where either the Local Government Ombudsman or the Housing Ombudsman has reached a formal decision on cases with the reporting period. Findings and recommendations from all enquiries are shared with respective Heads of Service.

Directorate	Issue Nature	Ombudsman findings	Financial remedy
Environment (LGO)	Noise Abatement	No maladministration	N/A
Housing (LGO)	Neighbour dispute re feeding of wildlife	Discontinue investigation	N/A
Environment (LGO)	Grass cutting in South Ockendon	Closed after initial enquiries	N/A
Housing (LGO)	Eligibility to join the Housing Register	Discontinue investigation	N/A
Environment (LGO)	Damage to possessions by the Council when working at neighbouring property	Outside jurisdiction	N/A
Democratic Services (LGO)	School Admissions appeal	Closed after initial enquiries	N/A
Environment (LGO)	Actions of waste and recycling crew. This related to frequent	Maladministration and Injustice	£100.00

	missed bin collections and not returning bins to correct location.		

2.6 MP and Member Enquiries

2.6.1 During the reporting period enquiries were received as follows:

- 1670 member enquiries were received, with 98% responded to within timeframe. The average time taken to respond to members enquiries across all Directorates was 6 calendar days.
- A total of 208 MP/MEP enquiries were received (8 MEP), of which 97% were responded to within timeframe.

2.6.2 MP enquiry trends and common themes are outlined below:

Directorate	Enquiry Type	Volume
Housing	Repairs	42
Housing	Homeless Service	26
Planning & Transportation	Planning Decision/ Advice	12
Children's Services	Primary Schools	11

2.6.3 Councillor enquiry trends and common themes are outlined below:

Directorate	Enquiry Type	Volume
Housing	Housing Transformation	62
Housing	Repairs	361
Housing	Tenancy Services Management	62
Housing	Anti-social behaviour	52
Environment	Waste & Recycling	31
Environment	Environmental Health & Trading Standards	49

2.7 Learning lessons from complaints

2.7.1 The most important aspect of any complaints management framework is the ability to demonstrate that the council can show evidence that it is learning from complaints received. Appendix 1 includes a high level summary of learning from upheld complaints which has been identified by the Directorates. Case studies showing learning from complaints are also uploaded onto the councils website.

2.7.2 Cumulative Management Information (MI) is submitted to senior performance officers where requested to enable more detailed analysis to take place on the types of feedback received and address any common themes and trends. However the Corporate Complaints Team will continue to analyse data and lead to address any performance issues with Directorates. The team will also

continue to provide management information to services as and when requested.

2.8 Compensation

2.8.1 Records confirm that within the reporting period financial compensation payments have been extended as outlined below:

Directorate	Complaint Stage	Financial remedy
Environment	LGO	100.00
Housing	Stage 3	500.00
[redacted]		**600.00**

2.9 Children's Social Care

2.9.1 The department recorded 154 representations under the Children's Statutory Social Care complaints procedure. 37 stage 1 complaints were received for this period. In addition, 4 stage 2 complaint investigations were started and 2 complaints progressed to stage 3. The department also addressed 2 Ombudsman enquiries, 7 MP enquiries and 7 member enquiries as well as 27 concerns. The department recorded 68 compliments.

2.9.2 In relation to the stage 1 complaints, 19 were not upheld, 3 were upheld, 6 were partially upheld and 9 are in progress. 11 complaints exceeded the 20 day timescale and in many cases this is due to the complex nature of the complaint requiring more time, however the complainant is kept informed of the progress of their complaint.

2.9.3 Three stage 2 complaints are at investigation stage and one was in the process of being arranged.

2.9.4 For the 2 Ombudsman cases, one case was a request for information and closed and the second case is currently at investigation stage.

2.9.5 One complaint was reviewed at stage 3 and the complaint was partially upheld. Learning is always addressed and disseminated to staff through action plans and quarterly reports to Senior Management Team. A full complaints and representations report is produced annually as a public document, which is a statutory requirement.

2.10 Adult Social Care

2.10.1 A total of 149 representations were recorded as received for this reporting period which included 18 complaints, 2 Ombudsman enquiries, 11 concerns, 9 MP enquiries and 22 Member enquiries. The department recorded 87 compliments.

2.10.2 In relation to the 18 complaints: 5 were upheld, 3 were partially upheld, 3 not upheld, 6 are in progress and in 1 case there was no finding. 5 complaints

exceeded the 20 working day timescale however these were as a result of the complaints requiring in-depth investigation and these complaints were **not** outside the statutory timescale for adult social care complaint responses.

2.10.3 In relation to the 2 Ombudsman cases, one case was concluded with no maladministration and the second case is currently with the investigator.

2.10.4 The service aims to successfully resolve issues and concerns at the point they are raised and promotes the same approach from commissioned providers. This approach means that more matters are being appropriately dealt with before they are escalated into the statutory complaints process. A full complaints and representations report is produced annually as a public document, which is a statutory requirement.

3. Issues, Options and Analysis of Options

3.1 There are no options associated with this paper.

4 Reasons for recommendations

4.1 This report is for noting purposes. There are no recommendations requiring approval.

5 Consultation (including Overview and Scrutiny, if applicable)

5.1 This report was sent to Performance Board and Director's Board.

6 Impact on corporate policies, priorities, performance and community impact

6.1 Complaints impact on the council's priority of delivering excellence and achieving value for money.

6.2 The complaints process seeks to create a culture of corporate learning from best practice from listening to our customers and by acting on complaints. All complaints received must have learning applied if the complaint outcome is upheld.

6.3 The complaints process aims to improve customers' and users' experience of accessing council services. This will support our customer services strategy.

7 Implications

7.1 Financial

Implications verified by: **Mike Jones**
Management Accountant

There are no direct financial implications with this report.

7.2 Legal

Implications verified by: **David Lawson**
Monitoring Officer & Deputy Head of Legal

Both the Courts and the Local Government Ombudsman expect complainants to show that they have exhausted local complaints / appeal procedures before commencing external action.

The implementation of our learning from complaints and listening to our residents should lead to a reduction of complaints received and a reduction in those going to the Ombudsman or the Courts.

Social Care for Adult and Children are required to follow a separate procedure stipulated by the Department of Health (DOH) and Department for Education & Skills (DFES).

7.3 Diversity and Equality

Implications verified by: **Natalie Warren**
Community Development and Equalities Manager

The Information Management Team will ensure that the Community Development and Equalities Manager are aware of all complaints that has an equality related expression of dissatisfaction.

7.4 Other implications

None

8 Background papers used in preparing the report

- Information has been obtained from the council's complaints system.

9. Appendices to the report

- Appendix 1 – Directorate performance data analysis and learning outcomes.

Report Authors:

Lee Henley/Tina Martin (Information Manager/Senior Corporate Complaints & Information Governance Officer).

Stephanie Case, Corporate Complaints & Information Governance Officer (Data Extraction).

APPENDIX 1

DIRECTORATE COMPLAINTS SUMMARY: APRIL TO SEPTEMBER 2015/16

DIRECTORATE: Chief Executive's Delivery Unit

Summary:

Expressions of dissatisfaction relate to:

- Strategy and Communications:
  - Issues with registering for 'My Account' online
  - Unhappy with procurement decision of a contract that was awarded
- Regeneration – Lack of action to vacant/un-used facilities.

Issue	Concerns rec'd	Concerns escalated	S1 rec'd	% upheld	S1 escalated	S2 rec'd	% upheld	S2 escalated	S3 rec'd	% upheld
Strategy and Communications	5 (18)	1 (1)	1 (1)	100% (100%)	0 (1)	1 (1)	0% (0%)	1 (0)	1 (0)	0% (0%)
Regeneration	0 (2)	0 (0)	1 (2)	100% (0%)	0 (1)	0 (1)	0% (100%)	0 (0)	0 (0)	0% (0%)

*Last year's fully year figures are shown in brackets

Learning from complaints as identified by the service includes:

- Strategy and Communications - A review of the answers to the security question will be carried out to ensure it covers all customer situations.
- Regeneration - Ensure residents are communicated to in a timely manner.

DIRECTORATE COMPLAINTS SUMMARY: APRIL TO SEPTEMBER 2015/16

DIRECTORATE: Chief Executive's Office

Summary:

Expressions of dissatisfaction relate to:

- Corporate Finance (Insurance related):
  - Unhappy with the outcome of a compensation claim.
  - Would like to claim for damages caused by pothole and lack of treatment to damp and mould.
- Democratic & Electoral Services:
  - Letter from electoral services was sent to the wrong address.
  - Concerns with the size of election posters.
- Complaints – Lack of contact to a complaint.
- Legal Services – False information given and lack of response.

Issue	Concerns rec'd	Concerns escalated	S1 rec'd	% upheld	S1 escalated	S2 rec'd	% upheld	S2 escalated	S3 rec'd	% upheld
Corporate Finance	3 (8)	0 (3)	1 (4)	0% (25%)	0 (1)	1 (1)	0% (0%)	1 (0)	2 (1)	0% (100%)
Democratic & Electoral Services	4 (1)	0 (0)	1 (0)	0% (0%)	1 (0)	2 (0)	0% (0%)	0 (0)	0 (0)	0% (0%)
Complaints	2 (0)	0 (0)	0 (0)	0% (0%)	0 (0)	0 (2)	0% (0%)	0 (0)	0 (0)	0% (0%)
Legal Services	0 (2)	0 (0)	1 (2)	0% (0%)	0 (1)	1 (2)	0% (50%)	1 (1)	1 (1)	0% (0%)

*Last year's full year figures are shown in brackets

Learning from complaints as identified by the service includes:

There is no learning as there were no upheld complaints.

DIRECTORATE COMPLAINTS SUMMARY: APRIL TO SEPTEMBER 2015/16

DIRECTORATE: Children's Services

Summary:

Top expressions of dissatisfaction relate to:

- Admissions - Issues with the online admissions, unhappy with school place offered for child
- Special Educational Needs (SEN) - Delays in recommendations of SEN annual reviews

Issue	Concerns rec'd	Concerns escalated	S1 rec'd	% upheld	S1 escalated	S2 rec'd	% upheld	S2 escalated	S3 rec'd	% upheld
Admissions	2 (10)	1 (1)	5 (3)	0% (66%)	1 (1)	1 (5)	0% (0%)	0 (3)	0 (3)	0% (33%)
SEN	4 (3)	0 (0)	2 (0)	0% (0)	0 (0)	0 (2)	0% (50%)	0 (1)	0 (1)	0% (0%)

Last year's full year figures are shown in brackets.

Learning from complaints as identified by the service includes:

As there were no upheld complaints there has been no learning identified

Points to note:

- Admissions – There has been a reduction in concerns received.
- Admissions – There has been an increase in complaints received, however the numbers are relatively low.
- SEN - There has been an increase in concerns and complaints received, however the numbers are relatively low.

DIRECTORATE COMPLAINTS SUMMARY: APRIL TO SEPTEMBER 2015/16

DIRECTORATE: Environment

Summary:

Top expressions of dissatisfaction relate to Missed bin collections, Non-return of bins, Environmental Health & Trading Standards, and Customer relations and include:

- Missed Bins - Bins not being collected on collection day.
- Non-return of bins - Bins not being put back in the correct place in relation to assisted collections.
- Env Health - Issues with animal welfare (horses), attitude of staff and noise nuisance.
- Customer Relations - Attitude and conduct of Waste and Recycling staff.

Issue	Concerns rec'd	Concerns escalated	S1 rec'd	% upheld	S1 escalated	S2 rec'd	% upheld	S2 escalated	S3 rec'd	% upheld
Missed bin collections	146 (247)	2 (21)	26 (47)	58% (85%)	4 (11)	9 (23)	66% (78%)	1 (3)	1 (4)	0% (50%)
Non return of bins	48 (44)	3 (8)	7 (12)	57% (83%)	2 (2)	3 (4)	33% (100%)	1 (0)	1 (0)	100% (0%)
Env Health & Trading Standards	27 (50)	1 (2)	4 (7)	0% (0%)	1 (1)	2 (6)	0% (0%)	0 (0)	0 (0)	0% (0%)
Customer Relations	3 (0)	1 (0)	1 (0)	100% (0)	0 (0)	28 (30)	85% (835)	2 (1)	2 (1)	0% (0%)

*Last year's full year figures are shown in brackets.

Learning from complaints as identified by the service includes:

- Missed Bins - Staff have been reminded of the service standards they must adhere to.
- Non-return of bins - Staff members have been reminded of their responsibilities for assisted collections.
- Env Health – No learning as there were no upheld complaints.

- Customer Relations - Collections are being monitored and internal HR investigations completed.

Points to Note:

- Missed Bins - The concerns stage shows fewer complaints formally escalating which indicates they are being dealt with swiftly within the 5 calendar day timeline.
- Non-return of bins – There has been an increase in concerns received at the mid-year point for 2015/16 compared with full year volumes for 2014/15. Due to this further analysis will be undertaken to establish the root cause, however early indications are that this may be as a result of rationalisation of the rounds which has taken place.
- Customer Relations – At the mid-year point for 2015/16, stage 2 complaint volumes are similar to the total received for 2014/15. Due to this further analysis will be undertaken to establish the root case.
- During 2014 Environment implemented the use of “Love my Street” and “My Account” as a mechanism for residents to use to report service requests and other types of customer feedback. Since April 2015, approximately 7000 service requests have been recorded via these channels. Due to this, there may be a significant number of concerns that have been reported via these channels of which the Corporate Complaints Team are not aware of. Environment are currently working with the Corporate Complaints Team to establish a process of ensuring that all concerns/complaints reported via these channels are included within complaints reports going forward.

DIRECTORATE COMPLAINTS SUMMARY: APRIL TO SEPTEMBER 2015/16

DIRECTORATE: Housing

Summary:

Top expressions of dissatisfaction relate to Transforming Homes, Repairs, Housing Solutions, Estate Management and Voids:

- Transforming Homes - Lack of communication from contractors and dissatisfaction with the quality of works
- Repairs - Issues with damp and mould, fencing and no updates concerning work being completed.
- Housing Solutions - Attitude of Housing Solution Officers, and non-return of telephone calls
- Estate Management - No response from Estate Officers
- Voids - Unhappy with the condition of property when let, void works still not complete

Issue	Concerns rec'd	Concerns escalated	S1 rec'd	% upheld	S1 escalated	S2 rec'd	% upheld	S2 escalated	S3 rec'd	% upheld
Transforming Homes	25 (90)	5 (28)	27 (48)	70% (45%)	7 (18)	9 (26)	66% (80%)	2 (7)	5 (7)	40% (71%)
Repairs	174 (473)	38 (101)	123 (301)	68% (56%)	35 (100)	54 (121)	61% (55%)	13 (31)	15 (38)	20% (10%)
Housing Solutions	38 (102)	5 (17)	20 (43)	10% (18%)	7 (11)	30 (32)	23% (6%)	1 (1)	1 (4)	100% (0%)
Estate Management	94 (258)	9 (44)	40 (90)	50% (32%)	7 (26)	18 (58)	11% (29%)	4 (14)	5 (16)	20% (18%)
Voids	28 (29)	7 (5)	15 (17)	47% (41%)	8 (6)	9 (7)	33% (14%)	4 (3)	5 (3)	0% (66%)

*Last year's full year figures are shown in brackets.

Learning from complaints as identified by the service includes:

- Transforming Homes - Contractors reminded of the service standards expected of them
- Repairs - Staff reminded of the importance of making contact when a commitment to do so has been given.
- Housing Solutions - Staff members have been spoken to, to ensure calls are returned within the time given.

- Estate Management – Staff reminded of the call back procedures to be followed.
- Voids - Ensure follow on void works are completed.

Points to note:

- Transforming Homes – The report identifies that a high % of Stage 1 and Stage 2 complaints are upheld. However in the period April to September, 582 council homes had works carried out under the Transforming Homes programme. Customer Satisfaction for the period is 76% which is based on good and excellent responses assessed against a 5 point scale.

  67% (391) of the properties receiving work under Transforming Homes in this period had two or more types of works completed. The works could include full replacement of a kitchen, bathroom, rewiring or new heating. These works require on average 15 contact visits per home (5865 in total). The remaining 33% (191 properties) had just one element completed which would require on average 10 contact visits (1910). Therefore the total number of concerns/complaints received in the period (66) represents 0.8% of the total contacts required to complete these works (7775).

- Repairs - 22% of concerns have escalated to a complaint. Additional analysis will be undertaken regarding this.
- Repairs – A high % of complaints are upheld at stage 1 and 2. However it should be noted that:
  - The total number of concerns/complaints for the period (366) represent 1.8% of the number of repairs undertaken which totalled 20,294.
  - Customer satisfaction for the period is 88% based on good and excellent responses assessed against a 5 point scale.
- Repairs - The report highlights a significant reduction in concerns received compared with 2014/15.
- Repairs - The report highlights a reduction in stage 1 complaints received compared with 2014/15.
- Estate Management – The report highlights a significant reduction in concerns received compared with 2014/15.
- Estate Management - A high % of Stage 1 complaints are upheld. Analysis is scheduled to complete at the end of Quarter 3 with the Senior Corporate Complaints Officer and Estates Team Manager in this respect.
- Voids - At the mid-year point for 2015/16, the volume of concerns received are similar to the total received for 2014/15. Additional analysis will be undertaken regarding this.
- Voids - At the mid-year point for 2015/16, stage 1 complaint volumes are similar to the total received for 2014/15. The volumes of voids undertaken in the period is 2.3% higher than in 2014/15 with 353 voids in period. Total concerns/complaints received (57) represent 16% against the number of voids completed.

- Following an assessment of stage 3 complaints, 27 cases were referred back to the Directorate to further address. This negated the need for formal investigations to take place at the final stage of the complaints procedure.

Data Quality:

- Repairs – Within the 2014/15 annual complaints report, 580 complaints were reported for repairs. This figure was incorrect and should have been 460. The error was caused due to Transforming Homes complaints being incorporated within the 580 figure along with a number of complaints for 2015/16.

DIRECTORATE COMPLAINTS SUMMARY: APRIL TO SEPTEMBER 2015/16

DIRECTORATE: Planning & Transportation

Summary:

Top expressions of dissatisfaction relate to: Potholes, Parking, and Planning Advice and Decisions

- Potholes - Delays in responding to conditions of roads and attitude from staff during telephone calls.
- Parking - Disputes over actions taken by staff in terms of issuing penalties
- Planning Advice - Lack of communication to enquiries, difficulty getting through to members of staff
- Planning Decisions - Disputes over Planning application decisions, delays with processing applications

Issue	Concerns rec'd	Concerns escalated	S1 rec'd	% upheld	S1 escalated	S2 rec'd	% upheld	S2 escalated	S3 rec'd	% upheld
Potholes	22	1	8	62%	1	2	50%	0	0	0%
	(54)	(2)	(11)	(27)	(2)	(2)	(0%)	(0)	(1)	(100%)
Parking	48	4	9	11%	1	3	33%	1	2	0%
	(78)	(7)	(23)	(9%)	(5)	(14)	(29%)	(3)	(3)	(0%)
Planning Advice	11	1	7	57%	2	3	33%	1	1	0%
	(17)	(3)	(9)	(11%)	(2)	(3)	(0%)	1	1	(0%)
Planning Decisions	5	3	9	33%	4	4	50%	0	0	0%
	(16)	(3)	(9)	(11%)	(3)	(6)	(33%)	(3)	(4)	(0%)

Last year's full year figures are shown in brackets.

Learning from complaints as identified by the service includes:

- Potholes - Staff reminded to respond to emails in a timely manner
- Parking - Staff reminded of the service standards they must adhere to
- Planning - Call groups have been updated to prevent difficulties in getting through to the department
- Planning Decisions - Changes to work distribution to ensure there are no further delays

Points to note:

- Planning Advice – At the mid-year point for 2015/16, stage 1 complaint volumes are similar to the total received for 2014/1, however numbers remain relatively low.

- Planning Decision - At the mid-year point for 2015/16, stage 1 complaint volumes are the same as the total received for 2014/15, however numbers remain relatively low.

- Following an assessment of stage 3 complaints, 1 case was referred back to the Directorate to further address. This negated the need for a formal investigation at the final stage of the complaints procedure.

DIRECTORATE COMPLAINTS SUMMARY: APRIL TO SEPTEMBER 2015/16

DIRECTORATE: SERCO

Summary:

Top expressions of dissatisfaction relate to Contact Centre, Council Tax, Housing Benefit, Sundry Debtors and include:

- Contact Centre - Incorrect advice given by contact centre staff, calls being cut off, delays in getting through to the council
- Council Tax - Disputes over council tax billing, actions of enforcement officers, attitude of staff
- Housing Benefit - Delays in processing benefit claims and making adjustments to claims, miscalculations in benefit claim
- Debtors - Conflicting advice on payments owed to the council, enforcement letters sent to incorrect property, attitude of staff

Issue	Concerns rec'd	Concerns escalated	S1 rec'd	% upheld	S1 escalated	S2 rec'd	% upheld	S2 escalated	S3 rec'd	% upheld
Contact Centre	13 (48)	0 (6)	4 (9)	50% (11%)	2 (0)	2 (8)	50% (12.5%)	0 (1)	0 (1)	- (0%)
Council Tax	84 (167)	7 (24)	29 (59)	24% (20%)	5 (13)	19 (78)	14% (10.3%)	1 (6)	1 (7)	0% (0%)
Housing Benefit	66 (109)	9 (15)	23 (44)	55% (32%)	5 (14)	10 (21)	30% (29%)	3 (2)	3 (3)	33% (0%)
Sundry Debtors	15 (13)	2 (0)	12 (10)	33% (30%)	0 (1)	35 (19)	23% (10.5%)	5 (3)	5 (3)	0% (0%)

Last year's full year figures are shown in brackets.

Learning from complaints as identified by the service includes:

- Contact Centre - Staff have reminded of processes they must follow
- Council Tax - Staff members have been spoken to regarding alleged attitude and reminded of required approach
- Housing Benefit - Staff to ensure data is correctly entered in relation to claims. In terms of addressing the delays in processing claims, this will be further analysed by the service and the Corporate Complaints Team.
- Debtors - Staff have been reminded of the procedures they must follow and the service standards expected of them.

Points to note:

- Housing Benefits – A high % of Stage 1 complaints are upheld. Additional analysis will be undertaken regarding this as initial indicators point to length of time taken to assess claims.

- Debtors - There has been a significant increase in stage 2 staff complaints received at the mid-year point for 2015/16, compared with full year volumes for 2014/15. Due to this further analysis will be undertaken to establish the root cause; however initial indicators are that some complaints should not be attributed to Debtors. For example, complaints about recharges on void properties, if upheld, need to be reassigned to Housing as investigations have highlighted that Housing have not been able to sufficiently evidence charges which are then chased up by Sundry Debtors.

- Following an assessment of stage 3 complaints, 2 cases were referred back to the Directorate to further address. This negated the need for a formal investigation.

13 January 2016	ITEM: 14 (Decision 01104342)

Cabinet

To Request Agreement to an Extension for the Day Opportunities Contract

Wards and communities affected: All	Key Decision: Key
Report of: Councillor Barbara Rice – Portfolio Holder Adult Social Care and Health	
Accountable Head of Service: N/A	
Accountable Director: Roger Harris – Director Adults, Health and Commissioning	

Executive Summary

The purpose of this report is to ensure that Cabinet is aware of the proposals regarding Day Opportunity Services for adults with learning disabilities provided currently by Thurrock Lifestyle Solutions Community Interest Company, together with seeking agreement to an extension to the current contract to facilitate further work on the proposals.

The contract has been in place for 3 years and the service has developed into one which provides many opportunities for disabled adults to gain skills and to become full members of their own communities. From the start of the contract the whole ethos of Thurrock Lifestyle Solutions has been to offer choice and support individuals to have as much control over their daily lives as possible. Detailed planning with individuals and imaginative ways of working, outside of a traditional working week model has meant that people have been able to direct their own support.

The next step in this work is to facilitate the development of the use of Direct Payments and Personal Budgets to ensure that those who use the services are aware of the amount of money they have available to buy what they need and have choice about how that money is spent. Thurrock Lifestyle Solutions has always been supportive and a leader in this way of working and to facilitate this happening Thurrock Council and Thurrock Lifestyle Solutions will be working in partnership to implement more fully a direct payment and personal budget approach.

It is proposed that the contract will be extended for 14 months to ensure that it finishes at the end of the financial year in March 2017 giving the maximum amount of time possible for the new approach to be developed and aligning the contract with the financial cycle to support budget management and value for money.

1. Recommendation(s)

That Cabinet approve:

1.1 The extension of the current contract for a period of 14 months from 1st February 2016 until 31st March 2017.

1.2 A further annual reduction to the contract price from £1,481,858 to £1,381,858 for the period of the 14 month extension. The saving on the current contract will be £116,678.30 during this period.

2. Introduction and Background

2.1 In February 2013 a block contract for Learning Disabilities Day Opportunities was agreed under a 'single source' tender for three years, being awarded to Thurrock Lifestyle Solutions (TLS). TLS was established in 2007 as a Community Interest Company to develop and support activities which benefit the community and in particular to assist disabled people to become integral members of the community in which they live.

2.2 The purpose of the service is to support adults with a Learning Disability to gain new skills, achieve their personal outcomes and reduce isolation; also supporting carers to have a break. The current provider utilises four Thurrock Council buildings as bases from which to deliver the service. As part of the service and under the terms of the contract TLS delivers a maximum of 2500 hours of support per week. With people also using their Direct Payment to receive support from TLS for Day Opportunities, this equates to one provider supporting over 70% of the total number of people with learning disabilities utilising Day Opportunities support hours.

2.3 The current contract is due to end on the 31st January 2016. The Care Act 2014 directs that people should have choice over the services they receive and how they receive them. Every person who receives support from Social Care will have a Personal Budget, which means they will know how much their support costs. Each person will be encouraged and supported to take this money as a Direct Payment therefore managing their own support and care. However if they do not take this as a direct payment there is still a duty placed on Local Authorities to ensure that each person knows how much their service costs and understands how the money is spent this is a Personal Budget allocation. From July 2015 each person has been able to have a clear figure for their individual budget and it is hoped as this progresses, more people will choose to take up the option of having this as a direct payment. This will mean as time progresses that the individual will become the commissioner of their own support and therefore commissioning and organising support and care will be carried out predominantly between providers and the individual rather than providers and the local authority.

2.4 Thurrock Council's vision is to have a diverse market that enables individuals to attain their own goals and aspirations through choice. Adult Social Care in

partnership with Health and Housing has produced a Market Position Statement outlining planning assumptions based on the future needs of local people. As a result, work is being carried out to “grow” the market of providers who can respond to service users commissioning their own services through Direct Payments, this work is ongoing. The extension period gives considerable opportunity to develop the market, supporting new and existing providers to be able to meet the demand for day opportunities offering choice and tailored support to meet individual’s needs. The wider strategic view regarding direct payments and personal budgets is that over the next year further development will take place of the process including training for individuals receiving services, staff and providers. The work stream will also ensure that a strong infrastructure internally to the Council, including social work, finance and monitoring systems is further developed. Also that externally direct payment support is available to assist with recruiting carers, accessing services and paying for those services together with positive advocacy for people to understand and manage the processes will be further developed Every eligible person will be given the opportunity and supported to receive a direct payment and purchase their own support . The work stream will explore other ways of delivering more choice and control including Individual Service Funds (ISF’s) which is money held by the provider but monitored with the full involvement of the person receiving services this will offer a further level of security for both providers and service users. Individuals who use services, families and carers will be integral to the shaping of the Day Opportunities offer and meaningful engagement will be continued.

2.5 As part of the current contract it was agreed that a 2.5% efficiency reduction would be made each year, as such the contract value has reduced over the 3 years from £1,558,825 per annum in 2012/2013 to £1,481,858 in 2014/2015. The contract value for 2016 /2017 will be £1,381,858 per annum; a further £0.100m reduction. The proposed extension of 14 months will total £1,612,156

3. Issues, Options and Analysis of Options

3.1 The Council could move over to personal budgets / direct payments at the end of the initial 3 year period or go out to tender for the day opportunities service. Both options are considered to be high risk as they may destabilise TLS who are a valuable local provider and the first in Thurrock to develop a Community Interest Company run by and for disabled people. A 14 month extension will allow officers of the Council to work more closely with TLS to ensure the company is ready for the move to a system where day services will be fully funded and supported through personal budgets.

3.2 For the financial year 2017/18 officers are of the view that a framework agreement offers the best way to deliver choice and encourage more providers into the market. This will be the subject of further discussions with

TLS and other providers and will be brought back to Cabinet with firm proposals.

4. Reasons for Recommendation

4.1 It is recommended that a 14 month extension to the TLS Day Opportunities contract be agreed to allow for development of the Market and to support the current provider, ensuring that they are able to continue to thrive and develop their service to prepare as fully as possible for the implementation of personal budgets.

5. Consultation (including Overview and Scrutiny, if applicable)

5.1 Discussions have been held internally with social care staff to review current provision. Information has been received from regional colleagues in respect of services being offered within the Eastern region. A range of providers locally and within the surrounding area have been spoken with to ascertain what opportunities might be available to support an offer within Thurrock to also gauge the likely responses to any proposed Framework. Officers are meeting regularly with TLS around their day opportunities offer going forward and how this will be delivered. Further discussions with service users are required, especially those going through the transition from children to adult services

6. Impact on corporate policies, priorities, performance and community impact

6.1 Improve Health and Wellbeing

The social interaction, inclusion and activities people are involved in have a direct effect on their health and wellbeing. More choice in the market will allow individuals to meet their outcomes in a more personalised way.

6.2 Create a great place for learning and opportunity

People with disabilities and autism aspire to be able to work or to learn new meaningful skills so they require good levels of support to attain their individual goals. Through a Personal Budget, an individual will be able purchase a service from a wider range of resources, which could include support with training, further education or work.

7. Implications

7.1 Financial

Implications verified by: **Mike Jones**
Financial Accountant

The savings associated with the reduction in the value contract have been factored into short and medium term financial planning of the service.

7.2 Legal

Implications verified by: **Paul O'Reilly**
Projects Lawyer

Under legal and procurement principles and good practice the contract is capable of the proposed extension, particularly in view of (a) the intended length of the extension and (b) the relative values of the extended portion of the contract when compared to the overall contract value. The fact of savings being generated also supports the Council's achievement of best value objectives

7.3 Diversity and Equality

Implications verified by: **Rebecca Price**
Community Development Officer

The work to be undertaken with TLS and the wider market must ensure that equality of opportunity is afforded to all people with Learning Disabilities. The proposals to offer and support more choice and control within day opportunities, the processes to introduce a wider range of services and changes to commissioning arrangements must deliver the statutory duty set out in the Equality Act 2010. This Statutory Duty is to promote equality of opportunity in the provision of services and employment, ensuring that all services are delivered in a non-discriminatory way, promoting equality.
An Equality Impact Assessment should be undertaken as the work progresses to inform any decisions regarding suggested options

7.4 Other implications (where significant) – i.e. Staff, Health, Sustainability, Crime and Disorder)

N/A

8. Background papers used in preparing the report (including their location on the Council's website or identification whether any are exempt or protected by copyright):

- N/A

9. Appendices to the report

- N/A

Report Author:

Kelly Jenkins
Commissioning Officer for Learning Disabilities and Mental Health

Adults, Health and Commissioning

13 January 2015	ITEM: 15 (Decision 01104343)

Cabinet

Highways and Transportation Works Programme and Policies Update

Wards and communities affected:	Key Decision:
All	Key

Report of: Cllr. Oliver Gerrish, Portfolio Holder for Highways and Transportation

Accountable Head of Service: Ann Osola, Head of Transportation and Highways

Accountable Director: David Bull, Director of Planning and Transportation

This report is Public

Executive Summary

This report seeks Cabinet approval of a number of interim Works Programme Outputs within the Highways and Transportation portfolio. Specifically, it seeks:

1) The endorsement of the prioritisation principles which will be used to determine the schemes put forward for delivery within the Maintenance Block of the 2016/17 Highways & Transportation Capital Programme;
2) Agreement to progress, with partners, a Considerate Contractor Scheme to reducing the inconvenience resulting from works on the highway.
3) The endorsement of a programme of cycle network improvements to support the aspirations for cycling set out in the 2013 - 2016 Thurrock Transport Strategy;
4) Approval to consult on the introduction of a pilot project similar to a lower emission zone which will:
   i) manage heavy goods vehicles,
   ii) improve air quality,
   iii) make it easier and safer to walk and cycle in residential areas unsuitable for HGVs and
   iv) support improved health of local people.

1. Recommendation(s)

That Cabinet:

1.1 Agrees planned maintenance prioritisation criteria in line with Government guidance on cost-effective asset management as set out in Appendix 1.

1.2 Approves the development, for future approval, of a considerate contractor scheme to improve traffic management within the Borough and reduce the inconvenience to businesses and residents resulting from works on the highway;

1.3 Agrees the programme of cycling network improvements contained in Appendix 2 as the basis for the Business Case for the draw-down of Local Growth Funding from the South East Local Enterprise Partnership (SELEP) in April 2016, and delegates authority to the Director of Planning and Transportation, in consultation with the Cabinet Member and Chief Executive, to agree the final business case for SELEP approval.

1.4 Gives approval to consult on a pilot project to provide more effective management of HGV movements in sensitive areas, as a means of improving air quality and reducing conflict caused by freight vehicles in residential areas.

2. Introduction and Background

2.1 This report seeks approval of number of policy updates and work programme outputs to progress the 2015/16 Transportation and Highways service delivery programme including annual capital programme, Considerate Contractor Scheme, cycle infrastructure delivery plan and air quality improvement pilot project.

3. Highways Asset Maintenance

3.1 Thurrock Council, as a Local Highways Authority has a statutory obligation under 1980 Highways Act to maintain the highway network as a public asset Thurrock's highway network includes:

- 560km of carriageway;
- 1000km of footway;
- 133 structures;
- 168 roundabouts;
- 50 traffic signals;
- 17,500 lighting columns;
- 3,500 illuminated signs;
- 1,500 illuminated bollards;
- 30,000 signs; and
- 20,000 gullies

3.2 All of the above are used by Thurrock's residents, businesses and visitors. As Thurrock grows and evolves it is important to continue to maintain its existing highway assets as well as new infrastructure to accommodate new developments.

3.3 In 2011 the Council published the Transport Asset Management Plan which set out how the Council prioritises planned maintenance investment in line with a whole life approach to asset category maintenance. Guidance issued by the Department for Transport (DfT) states that a Local Authority's asset management policy should be reviewed bi-annually. Appendix 1 sets out the core principles for prioritisation for each of the blocks within the annual Highways &Transportation capital programme. Cabinet is asked to endorse these principles as the basis for the 2016/17 delivery programme which will go forward for approval to the full Council in March 2016.

4. Highways Network Management

4.1 Under 2004 Traffic Management Act, Thurrock Council as Local Highways Authority has a statutory responsibility to manage its local road network to support free movement of traffic both on Thurrock roads and on the roads of neighbouring Authorities.

4.2 A particular challenge in recent months has been the need to reconcile the requirement of utility companies, building and civil engineering contractors to undertake emergency repairs and infrastructure improvements with the needs of road users seeking to access local businesses and amenities.

4.3 The 1991 New Roads and Street Works Act and its associated Code of Practice for the Co-ordination of Street Works and Works for Road Purposes and Related Matters places statutory obligations on all parties undertaking works on the highway to reinforce public safety, and ensure that undertakers consider the needs of other road users. However, a number of Local Authorities (including London) have established Considerate Contractor Schemes to encourage utility companies and other contractors on the highway to 'go the extra mile' to accommodate the needs of other road users, and of local businesses and residents in the way that they conduct their works. For example, the Code requires works on the highway to have information boards providing contact details for the entity undertaking the works and the anticipated duration of the disruption. This does not apply to works of an emergency or temporary nature. However, in London Boroughs, entities undertaking works use generic boards to identify themselves, with slots in the sign where site specific information can be added, and these are used for all works undertaken.

4.4 Cabinet is therefore asked to endorse the development of a Thurrock Considerate Contractor Scheme. This would be developed in collaboration with statutory undertakers and others conducting works on the highway for the purpose of reducing negative impacts of road works to road users, local businesses and residents. This scheme would then be brought back to Cabinet for approval in summer 2016.

5. Transport and Health

5.1 Thurrock's Community Priorities include a commitment to improving health and well-being within the Borough. The Highways and Transportation Work Programme supports this priority in a number of ways. This report will focus on the work which is being undertaken to support and encourage cycling as part of a healthy lifestyle, and on the development of measures to mitigate the contribution of traffic, and particularly heavy goods vehicles (HGVs) to air quality.

Cycle Infrastructure Delivery Plan

5.2 The 2013-26 Thurrock Transport Strategy sets out the Council's commitment to support and encourage higher levels of cycling in Thurrock as a means of improving accessibility, reducing congestion and pollution and encouraging healthy lifestyles. The programme of initiatives to deliver this commitment includes the development of a Thurrock Cycle Network which connects communities with key work, education and leisure destinations and which helps make better use of the Thames riverside and other cultural attractions across the Borough.

5.3 In summer 2014, the Government announced its allocation of funding for the first round of Local Growth Fund bids. This included a list of named schemes within the South East Local Enterprise Partnership (SELEP) area which have been provisionally allocated capital funding for delivery in the period 2015-2019. This included an allocation of £5M for Cycling Infrastructure Development in Thurrock for commencement in 2016.

5.4 Over the last few months, work has been undertaken to develop the programme of works which will be delivered with this funding. A cycle audit was undertaken to review the existing routes and identify missing links and barriers to cycling, as well as new routes that would lead to increased uptake in cycling. Partners were contacted to seek their views and aspirations for the development of Thurrock's cycle network. Schemes were prioritised based on their potential to bring about modal shift in more congested areas, particularly on the home to work or school journey and focussed in areas where access to housing, jobs and future growth is vitally important.

5.5 The result of this audit has fed into the production of a Cycle Infrastructure Delivery Plan as set out in Appendix 2.

5.6 The next steps to progressing the plan are to develop the first tranche of schemes to detailed design stage, and set out the details of the schemes to be delivered, along with a quantification of the benefits of delivering them in a report which will be submitted to the SELEP Accountability Board in March 2016, so as to allow funds to be drawn down from April 2016 onwards.

5.7 Cabinet is asked to endorse the work to date, and delegate authority to the Director of Planning and Transportation, in collaboration with the Chief

Executive and the Cabinet Member for Highways and Transportation to agree the final business case submission for the SELEP Accountability Board.

Air Quality

5.8 In June 2015, Thurrock's Health and Wellbeing Board received a report on the Health Impacts of Air Pollution in Thurrock. The report noted that poor air quality has significant adverse impacts on public health and that, within Thurrock's 16 Air Quality Management Areas, traffic movements, and in particular the movements of heavy goods vehicles, are a significant contributor to the problem. The Transportation and Highways Service has an ongoing work programme to identify and evaluate potential initiatives to improve the situation, and a comprehensive report on this subject will be brought to Cabinet in due course. However, it has become clear that there are particular problems when large number of heavy goods vehicles use unsuitable routes through residential areas. This has been an ongoing problem in a number of areas across the Borough, and the Council has introduced weight restrictions in an attempt to address it. However, to date, weight restrictions (i.e. lorry bans) rely on police officers for enforcement. With rising demands on limited police manpower, it is desirable that an alternative arrangement be explored.

5.9 It is therefore proposed that a pilot project, similar to a lower emission zone, is undertaken which uses camera enforcement to control freight on unsuitable routes. A number of possibilities will be explored:

- Camera enforcement of existing width restrictions with bus bypass facilities at London Road/Askews Farm Lane and High Road, North Stifford;
- Introduction of new width restrictions with bus bypasses with camera enforcement in Aveley High Street/Stifford Road;
- Investigation of spot HGV camera enforcement (with bus exemptions but excluding other 'except for access' rights) at London Road, west bound from its junction with Devonshire Road, London Road/Motherwell Way, South Road in South Ockendon, and Rectory Road/Towers Road.

5.10 This report seeks the approval of Cabinet to explore these options, in consultation with local residents, Essex Police, local businesses and the Safer Essex Roads Partnership and delegate authority to the Director of Planning and Transportation, in consultation with the Chief Executive and the Cabinet Member for Highways and Transportation, to progress a pilot initiative. The results of the pilot would be reported to Planning, Transportation and Regeneration Overview and Scrutiny Committee for consideration and comment, to inform decisions on larger scale initiatives across the Borough.

6. Reasons for Recommendation

6.1 The recommendations of this report support the delivery of community priorities, statutory obligations and the draw-down of grant funding.

7. Consultation (including Overview and Scrutiny, if applicable)

7.1 The prioritisation methods for Highways and Transportation Maintenance Programme have been discussed at Transportation, Planning and Regeneration Scrutiny Committee.

7.2 Strategic Partners (e.g. DP World, Sustrans, local cycling groups) have been consulted during the identification of schemes for the Cycling Infrastructure Implementation Plan.

7.3 The Considerate Contractor Scheme and Lower Emission Zone freight initiative will be the subject to extensive further stakeholder consultation as they are developed.

8. Impact on corporate policies, priorities, performance and community impact

8.1 This report is consistent with all five corporate priorities:

- **Create** a great place for learning and opportunity
- **Encourage** and promote job creation and economic prosperity
- **Build** pride, responsibility and respect
- **Improve** health and well-being
- **Promote** and protect our clean and green environment

9. Implications

9.1 Financial

Implications verified by: **Jo Freeman**

Management Accountant

The Highways and Transportation Capital Programme will be subject to a separate report to Full Council.

The Full Business Case on Cycling Infrastructure will be subject to S151 Officer sign-off.

The revenue costs of the development of a Considerate Contractor Scheme and Lower Emission Zone Pilot proposal would be met within existing Service budgets.

9.2 **Legal**

Implications verified by: **Vivien Williams**

Planning & Regeneration Solicitor

More effective engagement with third parties undertaking works on the highway will support the Council in the delivery of its statutory obligations under the 2004 Traffic Management Act and minimise disruption to highway users.

All cycle-ways will be subject to statutory consultation and creation of orders to legalise the use of bicycles on the pavement. The Council will ensure that the necessary orders are in place before construction works are completed on any routes. Any 'Shared Use Routes for Pedestrians and Cyclists' will be established in accordance with Department for Transport Local Transport Note 1/12 of that name dated September 2012.

The legal implications of a Thurrock Considerate Contractor Scheme and a Lower Emission Pilot will be evaluated once detailed plans have been agreed with partners.

9.3 **Diversity and Equality**

Implications verified by: **Rebecca Price**

Community Development Officer

Cycling provides an affordable and accessible mode of transport, providing significant environmental, health and well-being benefits. It is not envisaged that particular diversity or equality issues will be raised through the implementation of the cycle plan; however, further consultation with the diversity and equality team will be undertaken if the funding bid is successful, to identify and mitigate any risks as appropriate.

9.4 **Other implications** (where significant) – i.e. Staff, Health, Sustainability, Crime and Disorder)

Initiatives to improve air quality and accessibility will have a positive impact on public health

10. Background papers used in preparing the report (including their location on the Council's website or identification whether any are exempt or protected by copyright):

- Cabinet 17 December 2014 Highways Maintenance Efficiency Programme – Strategic Review and Recommendations for Improvement
- Council 11 March 2015 Cabinet Member Report – Highways and Transportation Capital Programme 2015/16
- Thurrock Transport Strategy 2013 - 2026
- Health and Wellbeing Board 15 June 2015 Health Impacts of Air Pollution in Thurrock Council
- Planning, Transportation, Regeneration Overview and Scrutiny Committee 4 November Highways Maintenance Update

11. Appendices to the report

- Appendix 1 – Highways Maintenance Prioritisation Principles
- Appendix 2 – Cycle Infrastructure Delivery Plan Scheme and Scoring Matrix

Report Author:

Ann Osola

Head of Service

Transportation & Highways

Appendix 1 – Highways Maintenance Capital Prioritisation Principles	
Scheme Type	**Method of prioritisation**
LTP Maintenance - Bridges	In accordance with the results of the bridge Inspections, prioritisation based on safety/risk.
LTP Maintenance - Principal Maintenance (Resurfacing / Reconstruction)	Results of the annual scanner machine surveys that are undertaken on Classified Roads, are processed to give the overall condition of each carriageway. Results obtained are of defects present and measured against set criteria, such as cracking, rutting, chip loss. The scores from the condition surveys give a prioritised list based on the condition of the carriageways. The scoring for individual schemes is weighted in relation to safety, economic significance (i.e. HGV route), accessibility (i.e. bus route), environmental sensitivity and public acceptance. Works to manage the asset condition through whole life cost optimisation will be included.
LTP Maintenance - Other Classified Road Maintenance (Resurfacing / Reconstruction)	
Unclassified (resurfacing / reconstruction)	Unclassified roads undertake a similar process with the exception that the surveys are of visual nature undertaken by independent accredited surveyors. 25% of roads inspected annually (i.e. a 4 year cycle).
LTP Maintenance - Footway & Cycleway Maintenance	Heavily used footways surveyed by Essex detailed visual inspections (DVIs) Produces BV187 Prioritised list by Inspectors' reports

LTP Maintenance – Street lighting	In accordance with the reports received as a result of the electrical tesing carried out every 6 years.
LTP Maintenance - (drainage)	Prioritised according to safety/risk associated and nature of the problems caused, in conjunction with the Flood Risk Manager.
LTP Maintenance - Other infrastructure (e.g. Safety Barriers road markings	Prioritised by safety risk posed to all road users.
Traffic Signals	Signal Upgrade Programme prioritised on road classification and according to the level of queue/congestion problems.
Rights of Way	In conjunction with walking/rambling associations and demand for routes to be provided/improved.
Road Safety Engineering - Traffic Management	AIP programme - Accident prioritisation 4 accidents in 50m over previous 3 years survey data
Safer Routes to Schools	a) TRACCS accessibility planning modelling b) Travel Plan objectives from Mode Shift STARS
Parking	a) Prioritised by Safety, free flow of traffic movement and accessibility b) HGV parking in accordance with the HGV Action Plan
Integrated Transport - Congestion	a) Transport Impact Assessments b) Traffic Master Data
Integrated Transport - Area Traffic Management	a) Cyclic area based review of service requests b) Cyclic area based review of existing traffic calming and sign clutter

Integrated Transport -Freight Management	In accordance with the HGV Action Plan
Integrated Transport - Accessibility	a) TRACCS accessibility planning modelling b) Major development Travel Plan objectives
Public Transport Infrastructure	a) TRACCS accessibility planning modelling b) Major development Travel Plan objectives
Walking & Cycling	a) TRACCS accessibility planning modelling b) Cycle Infrastructure Delivery Programme
Air Quality Management Areas	In accordance with the AQ Strategy

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Appendix 2 Programme of Cycling Network Improvements

Tranche 1 - High Priority							
Delivery Timescale	**Scheme**	**Area**	**Primary Ward**	**Secondary Ward**	**Road**	**Description**	**Median Estimate Cost £**
Year 1 2016-17	West Thurrock Way: Shared path and toucan crossings	Lakeside Basin	West Thurrock and South Stifford		B186 West Thurrock Way	Convert 3 x crossings to Toucans and remove guardrailings Convert southern footway to Shared Use, and de-clutter where appropriate	750,000
	South Ockendon: Advisory cycle lanes	South Ockendon	Belhus		Daiglen Drive	New on-road cycle lanes between Stifford Road and Arisdale Avenue by removing unnecessary large area of central hatching	175,000
	Devonshire Road: New shared path	Chafford Hundred	Chafford and North Stifford		Devonshire Road	New shared path on north side of Devonshire Road	175,000
	Purfleet bypass - New shared path	Purfleet	West Thurrock and South Stifford		Purfleet By-pass	New shared path on north side of the Purfleet By-pass, eastwards to the roundabout junction with London Road and A1090 Provide shared path signage and directional signage on newly constructed path	175,000
	Purfleet bypass - Toucan crossings	Purfleet	West Thurrock and South Stifford		A1306 Arterial Road Purfleet / A1090 / London Road Roundabout	Provide 2 x toucan crossings on roundabout entry / exits	375,000
	South Ockendon: New shared path and crossing	South Ockendon	Belhus		Daiglen Drive / Arisdale Avenue	New cycle-friendly crossing on Daiglen Drive to allow access to route across park linking to Arisdale Avenue Provide off-road link across park to new path funded through S.106 and complete path at northern end of Arisdale Avenue	100,000
	Chafford Hundred: New Toucan crossings	Chafford Hundred	Chafford and North Stifford		A1012 Elizabeth Road / Hogg Lane Roundabout	2 x new toucan crossings on south and west roundabout arms	175,000
	Lakeside Basin: New toucan crossing	Lakeside Basin	West Thurrock and South Stifford		Cygnet View	New Toucan crossing, and conversion of existing zebra crossing on West Thurrock Way to Shared Use	100,000
	Purfleet: New shared path	Purfleet	Aveley and Uplands		A1306 Arterial Road Purfleet	New shared path on southern side of A1306 between the Purfleet by-pass roundabout and Armor Road	175,000
	Aveley: New shared path	Aveley	Aveley and Uplands		Stifford Road	Exisitng sub-standard shared path on southern side of Stifford Road to be widened to 2.5m+	100,000
	Purfleet: Relocation of sign	Purfleet	Aveley and Uplands		A1306 Arterial Road Purfleet	Relocate large sign away from the cycle path	20,000
	Purfleet: New toucan crossings	Purfleet	Aveley and Uplands		A1306 Arterial Road Purfleet	Provide 2 x toucan crossings in place of existing uncontrolled crossings of roundabout	155,000
						Tranche 1 Sub-total	**2,475,000**
Reserve schemes to be implemented if/when funding becomes available	Grays: New off road cycle link	Grays	Tilbury Riverside and Thurrock Park	Grays Thurrock	A126 / A1089	New off-road link from Dock Road under A1089 Rail Bridge, alongside Uniserve to Thurrock Park Way. This will link to the proposed new path from Thurrock Park Way to Manor Road via the marsh area	750,000
	Chafford Hundred: New Toucan crossings	Chafford Hundred	Chafford and North Stifford	South Chafford	A1306 / B146 / B186 Roundabout (signals removed)	Convert crossing on eastern arm to standalone toucan crossing New toucan crossing Convert existing pedestrian island to toucan crossing	375,000
	South Ockendon: New toucan crossing and de-cluttering	South Ockendon	Belhus		Stifford Road / Daiglen Drive	Convert existing pedestrian crossing at junction to toucan and remove unnecessary guardrail	175,000
	Chadwell St Mary: New shared path	Chadwell St Mary	Chadwell St. Mary		Chadwell Recreation Ground	New Shared Use track on north side of recreation ground	100,000

Tranche 2 - High Priority but requires consultation, orders or agreements							
Delivery Timescale	**Scheme**	**Area**	**Primary Ward**	**Secondary Ward**	**Road**	**Description**	**Median Estimate Cost £**
Year 2 2017-18	West Tilbury Marshes: Conversion to shared use	West Tilbury Marshes	East Tilbury	Tilbury Riverside and Thurrock Park	Footpath 146	Convert to Shared Use (+signing) Includes upgrade of access bridge.	875,000
	South Ockendon: New shared path	South Ockendon	Belhus		B186 South Road	Convert existing footpath and wide verge on west side of South Road to shared path between Stifford Road and Tamarisk Road Upgrade existing pedestrian path linking South Road with Tamarisk Road to shared path.	375,000
	West Thurrock: Shared path and toucan crossing	West Thurrock	West Thurrock and South Stifford		London Road	Widen existing footway on southern side to provide shared path between A1090 Roundabout and St Clements	375,000
	Stanford-Le-Hope: New advisory cycle lanes	Stanford-le-Hope	Stanford-le-Hope West		London Road	New advisory lanes (+ remove centre markings)	100,000
	North Stifford: New shared path	North Stifford	Chafford and North Stifford		Pilgrims Lane (B186)	New shared path on west side of South Road linking to new crossing to be provided across A1306 (item 47)	175,000
	West Thurrock: New shared path	West Thurrock	West Thurrock and South Stifford		A1306 Arterial Road West Thurrock	Widen existing shared path on south side into verge	175,000
	Purfleet: New shared path	Purfleet	West Thurrock and South Stifford	Aveley and Uplands	A1090 Stonehouse Lane	New shared path on western side	175,000
	Thames Riverside: New shared path	West Thurrock Marshes	West Thurrock and South Stifford		Footpath 141	Convert footpath to Shared Use (+Signing)	175,000
	Thames Riverside: New shared path	West Thurrock Marshes	West Thurrock and South Stifford		Footpath 141	Convert footpath to Shared Use (+Signing)	175,000
	Aveley: New shared path	Aveley	Aveley and Uplands		B1335	Provide new shared path on north side of the B1335, providing a link to the existing cycle network in Aveley	375,000
						Tranche 2 Sub-total	**2,100,000**
Reserve scheme	South Ockendon: New shared path	South Ockendon	Belhus		Tamarisk Road	Convert existing wide path on west side adjacent to railway line to shared path. Some local widening required and removal of trees	175,000

Tranche 3 - Lower Priority and / or More Delivery Risk							
Delivery Timescale	**Scheme**	**Area**	**Primary Ward**	**Secondary Ward**	**Road**	**Description**	**Median Estimate Cost £**
Year 2 2017-18	Grays: New shared path and crossing	Grays	Little Thurrock Rectory		A126	New section of Shared Use track and Zebra Crossing to connect Route 5	175,000
	Heron Way: New shared path and toucan crossing	Lakeside Basin	West Thurrock and South Stifford		Heron Way	Convert western footway to Shared Use New Toucan Crossing to connect existing Shared Use tracks	175,000
	Lakeside Basin: New toucan crosisng	Lakeside Basin	West Thurrock and South Stifford		Service Area SE	New Toucan Crossing to tie-in with existing and proposed Shared Footways	100,000
	South Ockendon: Cycle access bridge and shared path	South Ockendon	Belhus		Afton Drive / Barle Gardens	Convert existing wide footpath to shared Allow cycling on bridge over railway line. Minor physical alterations required to ensure safety	100,000
	Tilbury: New shared path	Tilbury	Tilbury Riverside and Thurrock Park		A126 Calcutta Road	Widen existing footway, and create new Shared Use track on north side	100,000
	Tilbury: Widen existing advisory cycle lanes	Tilbury	Tilbury Riverside and Thurrock Park	Tilbury St. Chads	Civic Square	Widen+Re-align cycle lanes through Civic Square	100,000
	Tilbury: Widen existing advisory cycle lanes	Tilbury	Tilbury Riverside and Thurrock Park	Tilbury St. Chads	Brennan Road	Widen cycle lanes (+remove centre line markings)	100,000

Continued on next page

Tranche 3 - Lower Priority and / or More Delivery Risk Continued from last page							
	Scheme	**Area**	**Primary Ward**	**Secondary Ward**	**Road**	**Description**	**Median Estimate Cost £**
	Chadwell St Mary: New shared path	Chadwell St Mary	Chadwell St. Mary		Brentwood Road	Convert eastern footway to Shared Use from junction with River View to Claudian Way. Change to western footway up to	100,000
	Purfleet: New toucan crossing	Purfleet	Aveley and Uplands		A1090/A1306 & A1306 Arterial Road Purfleet	Upgrade existing pelican crossing to toucan crossing and associated widening of central island. Improved alignment of shared cycle path on existing tight corner. Removal of guardrailing where it is not required	175,000
	North Stifford: New shared path	North Stifford	Stifford Clays		Blackshots Lane	New shared path on verge	100,000
	North Stifford: New toucan crossing	North Stifford	Chafford and North Stifford		B186 South Road	New toucan crossing across the B186 linking several shared paths and providing continuity as cycle route switches from one side of the road to the other	100,000
	Little Thurrock: New crossing facility	Little Thurrock	Little Thurrock Blackshots		Stanford Road / Lodge Lane Roundabout	Enhanced crossing facility	100,000
						Tranche 3 Sub-total	**1,425,000**
Reserve scheme	Aveley: New shared path	Aveley	Aveley and Uplands		Aveley By-pass	New shared path on southern side of Aveley By-pass linking to cycling facilities provided as part of the new housing development	175,000
	Stifford: New shared path	North Stifford	Stifford Clays		Stifford Clays Road	New shared path on east side	175,000

Tranche 4 - On Hold							
Delivery Timescale	**Scheme**	**Area**	**Primary Ward**	**Secondary Ward**	**Road**	**Description**	**Median Estimate Cost £**
Reserve schemes to be implemented if/when funding becomes available	South Ockendon: Widen shared path	South Ockendon	Belhus		Stifford Road	Widen existing shared path on south side into verge	375,000
	Corringham: New shared path	Corringham	Stanford East and Corringham Town		Central Avenue	New cycle path route from Lampits Hill through Central Avenue, on the Frost Estate, to Springhouse Road and the Corringham Town centre	175,000
	Thames Riverside: St Clements Road	West Thurrock Marshes	West Thurrock and South Stifford		St. Clement's Road	Re-open cycle access from St. Clement's Road to riverside	175,000
	Corringham: New advisory cycle lanes / shared paths	Corringham	Corringham and Fobbing		Giffords Cross Avenue / Lampits Hill Avenue	New cycle path on Giffords Cross Avenue north to Lampits Hill Avenue to join existing made up roads and pathways to Gable Hall School. At the southern end the route would turn into Chase Road and then right to join the existing cycle paths on the Manorway	375,000
	Tranche 4 Sub-total						1,100,000

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13 January 2016	ITEM: 16 (Decision 01104344)
Cabinet	
Thurrock Local Flood Risk Management Strategy	
Wards and communities affected: All	**Key Decision:** Key
Report of: Councillor Gerard Rice, Portfolio Holder for Environment	
Accountable Head of Service: Ann Osola, Head of Transportation and Highways	
Accountable Director: David Bull, Director of Planning and Transportation	
This report is Public	

Executive Summary

Thurrock has suffered the consequences of flooding in recent years, and it has been estimated that there are more than 8,000 properties across the Borough at risk of flooding from surface water runoff. The key aim of the Local Flood Risk Management Strategy is to reduce the likelihood and detrimental consequences of flooding.

The predicted consequences of flooding to property, businesses and infrastructure have been analysed and those areas identified to be at more significant risk have been delineated into Areas of Critical Drainage (AoCD). Fourteen AoCDs have been identified in Thurrock; they are spread across the Borough, but largely concentrate on urban centres.

An Action Plan has been developed alongside the Strategy with measures identified to tackle surface water flood risk across Thurrock and in specific AoCD. Actions include establishment of policy positions on restricting surface water runoff in new developments and increasing residents' ability to protect themselves in times of flood. The Council is also working on designs for flood storage areas on the edge of Stanford le Hope to reduce the risk of flooding to around 300 properties and has allocated £300k of capital funding over the next 3 years to implement the measures. A project is also underway in Tilbury to produce a computer model of the drainage system, providing evidence of flood risk to support future bids for funding for measures to improve drainage infrastructure, addressing the effects of future climate change.

1. Recommendation(s)

1.1 To approve the Thurrock Local Flood Risk Management Strategy for the period 2016-2021.

1.2 To endorse the prioritised measures and interventions for implementation outlined in the Strategy Action Plan (Appendix 1 A).

2. Introduction and Background

2.1 Based on surface water mapping provided by the Environment Agency, it is estimated that more than 8,000 properties in Thurrock are anticipated to be at risk of surface water flooding during an extreme rainfall event. To meet the Council's statutory obligation as Lead Local Flood Authority as well as to improve our understanding and management of this risk, the Council has prepared this Local Flood Risk Management Strategy.

2.2 Flooding is likely to become a more frequent event due to climate change, and the scale of flood events may also increase in the future. The cause of the increase in flood events would be wetter weather throughout the year contributing to surface water flooding through the overloading of the existing drainage systems, as well as river flooding through increased catchment runoff.

2.3 The Flood & Water Management Act 2010 has assigned new responsibilities to local authorities, so that the council now works in partnership with the Environment Agency (EA), water companies and others to manage various aspects of flood risk. The Strategy has been developed to integrate with the existing strategic and operational roles of the Council and its Partners, as defined in published strategies and plans.

2.4 The Strategy also aims to clarify the roles of the key Partners, and improve cooperative working between them through the sharing and communication of information. Flood management solutions can therefore be developed to provide multiple benefits to improve the natural and social environment, in keeping with existing strategies.

3. Issues, Options and Analysis of Options

3.1 A range of options have been identified to improve management of surface water flood risk across Thurrock. The options have been developed from a review of previous studies, Multi-Criteria Analysis (MCA) of individual measures, site inspection, detailed modelling and consultation with project partners and stakeholder organisations.

3.2 19 options (see Action Plan in Appendix 1 A) have been identified for generic implementation across Thurrock, most likely through the introduction or amendment of Council policy, such as introduction of a risk based

maintenance regime, awareness raising and changes to planning policies prioritising sustainable solutions.

3.3 The location specific options (outlined in Appendix 1 A) for potential implementation within Thurrock are unlikely to bring about wholesale sustainable management of surface water on their own. Instead, the overall philosophy is for incremental change which takes advantage of opportunities as they arise to implement options which cumulatively have the effect of better managing flood risk.

3.4 **Stanford Le Hope Flood Surface Water Flood Alleviation Schemes**

Surface water modelling identified the urban area of SLH as being at highest risk of surface water flooding, with over 3,500 properties found to be at risk. Investigations have been undertaken to determine options to reduce runoff into the town, resulting in the potential introduction of up to 4 flood storage areas on the edge of the town, providing increased protection to nearly 300 properties. Further flood modelling and design work is being undertaken to refine the options, with the aim of submitting applications for funding to the Environment Agency in 2016. The Council has reserved £300k of match funding to contribute to the schemes over the next 3 years.

3.5 **Tilbury Integrated Urban Drainage Model**

Tilbury is a very flat, low lying urban area that is heavily reliant upon existing drainage infrastructure. It has a history of surface water flooding incidents and is expected to be at greater risk with predicted rises in sea level, making discharge of rainwater from drainage systems more difficult in the future. A project is underway to produce a computer model to accurately identify the potential options for reducing this risk and provide evidence for funding bids to finance potential mitigation in the future.

4. Reasons for Recommendation

4.1 According to climate change predictions the frequency and intensity of storms is expected to increase, resulting in an increased risk of flooding across Thurrock. Even if all existing flood management assets are maintained and replaced to their original specification and all new development takes flood risk and climate change into account, there will be an increased risk of flooding. Implementation of the recommendations within the Strategy provides a sustainable approach to incrementally manage flood risk.

5. Consultation (including Overview and Scrutiny, if applicable)

5.1 The Strategy has been produced in collaboration with Partner Risk Management Authorities (RMAs) including Anglian Water, Environment Agency and Essex County Fire and Rescue Service. The scope of the Strategy was approved by representatives of these agencies at the Thurrock

Flood Partnership; individual Partner meetings and consultations on draft versions of the Strategy were undertaken as part of its development.

5.2 Public engagement into the Strategy started with the development of the Preliminary Flood Risk Assessment in 2011. The public, Partners and Members were invited to provide information on flood events as part of this exercise. This was followed up by development of the Council's Surface Water Management Plan in 2013/14, which involved extensive consultation to seek confirmation of flood extents and acceptance of mitigation options.

5.3 A further survey was conducted at the beginning of the year to determine residents' understanding of flood risk, roles and responsibilities as well as their views and expectations of the Council and its Partners in managing local flood risk. This information was invaluable in the development of the Strategy.

5.3 Councillors and wider stakeholders were first invited to input into the Strategy development in March 2015 in response to the Strategic Environmental Assessment (SEA) scoping report, which asked for comments on the Strategy's aims and objectives. The Strategy was subsequently developed and culminated in a public consultation between July and September 2015. The consultation was conducted through the Council's website, with paper copies made available in all public libraries. It was promoted through local media and all Members were written to in advance of the start of the consultation inviting their further involvement.

6. Impact on corporate policies, priorities, performance and community impact

6.1 Better management of flood risk in Thurrock plays a very important part in meeting the Council's priorities; from ensuring the community is safe by raising awareness of flood risk and personal responsibility of householders to protect their own property, to reducing flood risk where possible through interventions such as flood storage areas or improvements to drainage. Through the introduction of Sustainable Drainage Systems (SuDS) in new developments flood risk will be reduced whilst at the same time improving habitat, biodiversity and public amenity, all helping to protect Thurrock's clean and green environment.

6.2 The option of 'do nothing' or 'do minimum' to tackle flood risk in Thurrock could mean potentially more properties will flood and for those already at risk of flooding they will potentially flood to a greater depth and/or more frequently. These options in the short term may save money by not having to invest in flood mitigation measures. However, the potential costs in terms of flood damages and impact on communities, the environment and infrastructure far outweigh any investment in mitigation measures.

7. Implications

7.1 Financial

Implications verified by: **Michael Jones**

Corporate Finance Officer

7.2 Funding for flood defence and coastal protection projects comes from four sources:

- Central Government – Flood Defence Grant in Aid (FDGiA)
- Local Levy – a levy issued by the Environment Agency on the recommendation of the Regional Flood and Coastal Committee and voted for by the LLFA members of the committee
- Contributions from other sources, including beneficiaries, local communities and others
- Un-ring-fenced Local Support Services Grant

7.3 FDGiA is allocated to projects on a competitive basis through a system known as Partnership Funding. In practice, projects will not achieve funding until they have been developed sufficiently to have business case approval. They may be fully or partially funded by FDGiA depending on the outcomes delivered relative to costs. Funding from other sources is therefore essential, such as the local levy, to pump-prime schemes through to business case approval so they can be eligible for national FDGiA.

7.4 The Strategy highlights areas in Thurrock with susceptibility to local sources of flooding and identifies a number of options to reduce this risk. By identifying these options this could raise expectation on the Council to fund mitigation measures. The options identified through the Action Plan will be further developed for submission towards FDGiA allocation, however, these schemes are unlikely to be fully funded and therefore contributions from others will be investigated so that they can be implemented.

7.5 Legal

Implications verified by: **Vivien Williams**

Planning and Regeneration Solicitor

7.6 The statutory power to undertake proposals to manage flood and erosion risks are held by Thurrock Borough Council under the Land Drainage Act 1991 and the Flood and Water Management Act 2010, although these are permissive powers only. The production of the Local Flood Risk Management Strategy ensures that the Council has satisfied its requirement as a Lead Local Flood Authority under the Flood and Water Management Act 2010 to produce a local strategy setting out significant local flood risks affecting its area and how it intends to address them.

7.7 **Diversity and Equality**

Implications verified by: **Becky Price**

Community Development Officer

7.8 The Strategy will be targeting flood risk management measures according to probability and impact, as highlighted in the Action Plan. The plan has not highlighted any specific diversity and equality issues, but during the implementation of the individual measures in the action plan, such as communication of flood risk and investigation of flood alleviation projects, further consultation with the Council's communications and diversity teams will be undertaken. This will ensure that further issues are understood and addressed as necessary.

7.9 **Other implications** (where significant) – i.e. Staff, Health, Sustainability, Crime and Disorder)

Not applicable

8. Background papers used in preparing the report (including their location on the Council's website or identification whether any are exempt or protected by copyright):

- Thurrock Surface Water Management Plan Final Report: www.thurrock.gov.uk/flood

9. Appendices to the report

- Appendix 1: Thurrock Local Flood Risk Management Strategy and Appendices A - H

Report Author:

Lee Stevens

Flood Risk Manager

Transport Development

Thurrock Local Flood Risk Management Strategy

Final

December 2015

Version

Version	Date	Amendments
Draft v1.0	June 2015	
Draft v2.0	July 2015	Minor text amendments
Draft v3.0	December 2015	Amendments following consultation
Final v1.0	December 2015	Updated property counts and mapping

Foreword

The development of this first Local Flood Risk Management Strategy for Thurrock shows we are better prepared than ever to tackle the threats and impacts of flooding here.

Although most people will consider Thurrock is mainly if not only at risk from river flooding – especially from the Thames – we are in fact at risk from intense rainfall overwhelming our drainage systems and sewers; from other rivers bursting their banks; and from high tides and even stormy seas.

With an aging infrastructure and pressures such as housing and other developments increasing our vulnerability, it is more important than ever we implement this strategy to increase our resistance, resilience and preparedness.

Although Thurrock has not suffered the effects of flooding to the same extent as other parts of the country in recent years, we do have a history that many will remember and evidence suggests the severity and frequency of flooding events is likely to increase so we must not be complacent.

This strategy has been developed together with other partners responsible for flood risk across the region and I welcome this approach of working together.

I trust you find the information in this strategy reassuring and understand how Thurrock Council and its partners are taking a collaborative and pro-active approach to minimising the risks to our residents, their homes, their businesses and our valuable natural environment.

Cllr Gerard Rice, portfolio holder for Environment.

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Glossary

AEP (Annual exceedance probability)	The percentage chance of a flood occurring in any one year. For example, a flood event with a 1% AEP has a 1% chance of occurring in any one year.
AoCD (Area of Critical Drainage)	A discrete geographic area where multiple and/or interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones during severe weather thereby affecting people, property or local infrastructure.
Asset Register	A database of flood risk assets for use by RMAs. It includes information on each asset and ownership.
Register of flooded properties	A water-company held register of properties which have experienced sewer flooding due to hydraulic overload, or properties which are 'at risk' of sewer flooding more frequently than once in 20 years.
Fluvial Flooding	Flooding resulting from water levels exceeding the bank level of a watercourse
Groundwater	All water which is below the surface of the ground and in direct contact with the ground and subsoil.
Habitats Regulations Assessment	Required by Article 6 of the EC Habitats Directive 1992 (92/44/EEC) and Regulation 48 of the Conservation (Natural Habitats) Regulations 1994, to assess the potential impact of implementing a plan or programmes objectives and measures against European Designated Sites.
IDB (Internal Drainage Board)	A local public authority established in areas of special drainage need in England and Wales. They have permissive powers to manage water levels within their respective drainage districts and undertake work to reduce flood risk to people and property.
Local Flood Risk	Risk of flooding from surface water, ordinary watercourses and groundwater.
Main River	A watercourse shown as such on the Main River Map, and for which the Environment Agency has regulatory responsibilities and permissive powers.
Ordinary Watercourse	All watercourses that are not designated Main River. Local Authorities or, where they exist, IDBs have similar permissive powers as the Environment Agency in relation to flood risk management. However, the riparian owner has the responsibility of maintenance.
Pluvial (surface water) flooding	Flooding as a result of high intensity rainfall when water is ponding or flowing over the ground surface (surface runoff) before it enters the underground drainage network or watercourse, or cannot enter it because the network is full to capacity.
Resilience Measures	Measures designed to reduce the impact of water that enters property and businesses; could include measures such as raising electrical appliances.
Resistance Measures	Measures designed to keep flood water out of properties and businesses; could include flood guards for example.

Riparian owner	A landowner whose land lies on or adjacent to a watercourse.
Risk	In flood risk management, risk is defined as a product of the probability or likelihood of a flood occurring and the consequence of the flood.
Risk Management Authorities (RMAs)	Defined in Section 6(13) of the Flood and Water Management Act 2010 as District and Borough Councils, Lead Local Flood Authorities, the Environment Agency, Water Companies, Highways Authorities and Internal Drainage Boards
Return Period	An estimate of the interval of time between events of a certain intensity or size, in this instance it refers to flood events. It is a statistical measurement denoting the average recurrence interval over an extended period of time. It should be remembered that the chance of experiencing a flood with a given Return Period is the same for each and every year and is not the actual interval between flood events (see also Annual Exceedance Probability – AEP).
Sewer flooding	Flooding caused by a blockage or overflowing in a sewer or urban drainage system.
SoP	Standard of Protection - Defences are provided to reduce the risk of flooding from a river and within the flood and defence field standards are usually described in terms of a flood event return period. For example, a flood embankment could be described as providing a standard of protection against a 1% AEP flood.
Stakeholder	A person or organisation affected by the problem or solution, or interested in the problem or solution. They can be individuals or organisations, includes the public and communities.
Strategic Environmental Assessment	Required to assess how a plan or programme might impact or contribute to the achievement of wider environmental objectives (SEA Directive) alongside the Conservation of Habitats and Species Regulations 2010 (HRA) and Water Framework Directive (WFD).
SuDS	Sustainable Drainage System - Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques
Surface water (pluvial) flooding	Flooding as a result of high intensity rainfall when water is ponding or flowing over the ground surface (surface runoff) before it enters the underground drainage network or watercourse, or cannot enter it because the network is full to capacity.
SWMP	Surface Water Management Plan - The SWMP plan should outline the preferred surface water management strategy and identify the actions, timescales and responsibilities of each partner. It is the principal output from the SWMP study.
Tide locked	The difference in relative water levels of watercourses and tides impacts on drainage assets such as flaps and non-return valves. It causes fluvial flows on tributaries to be prevented from entering the estuary. The effect of high tide levels results in raised water levels in the tributaries which can cause localised flooding.

Acronyms

AEP	Annual Exceedance Probability (AEP)
AIMS	Environment Agency's Asset Information Management System
CFMP	Catchment Flood Management Plan
CIRIA	Construction Industry Research and Information Association
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EU	European Union
FRA	Flood Risk Assessment
FRM	Flood Risk Management
FRMP	Flood Risk Management Plan (Risk Regulations, 2009)
FWMA	Flood and Water Management Act 2010
GiA	Grant in Aid
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
PFRA	Preliminary Flood Risk Assessment
SFRA	Strategic Flood Risk Assessment
uFMfSW	Updated Flood Map for Surface Water

Using this document

Hyperlinks

Hyperlinks have been provided where there are useful reference points. These are shown as **green bold text.**

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1 Introduction

1.1 Background

Following severe flooding in 2007 the Government commissioned a review (The Pitt Review, 2008) to learn from what had happened and to set out what should be done in the future to reduce the risk and impacts of flooding on communities. The review contained 92 recommendations, of which many have now been translated into primary legislation through the enactment of the Flood and Water Management Act 2010 (FWMA).

One of the recommendations (14) was that

'*local authorities should lead on the management of local flood risk, with the support of the relevant organisations*.'

This particular requirement of the FWMA has established Thurrock Council as a Lead Local Flood Authority (LLFA) with responsibility for:

- Developing, maintaining, applying and monitoring a Local Flood Risk Management Strategy (LFRMS) that encompasses all localised sources of flooding.

Flooding from ordinary watercourses, surface water and groundwater are called 'local sources' of flood risk and these were investigated in 2011 during the preparation of the Thurrock Preliminary Flood Risk Assessment (PFRA). The PFRA was prepared to meet the requirements of the Flood Risk Regulations, 2009, which transposed the EU 'Floods Directive' 2007 into English and Welsh Law. The Local Flood Risk Management Strategy is able to make good use of the results obtained in the PFRA.

1.2 What is a Local Flood Risk Management Strategy?

This document is the Local Flood Risk Management Strategy (hereinafter referred to as the Flood Strategy) for Thurrock and aims to provide a framework for how we will manage local flood risk. This Local Strategy sets out how we, as the LLFA, alongside other Risk Management Authorities (RMAs), are responding to the flood risk identified in Thurrock.

Our Strategy specifies:

i. the RMAs in Thurrock;

ii. the flood and coastal erosion risk management functions that may be exercised by the RMAs in relation to Thurrock;

iii. the objectives for managing local flood risk;

iv. the measures proposed to achieve those objectives;

v. how the measures are expected to be implemented;

vi. the timeframe for implementing the measures;

vii. the costs and benefits of the measures, and how they will be paid for;

viii. how and when the Strategy is to be reviewed; and

ix. how the Flood Strategy contributes to the achievement of wider environmental objectives.

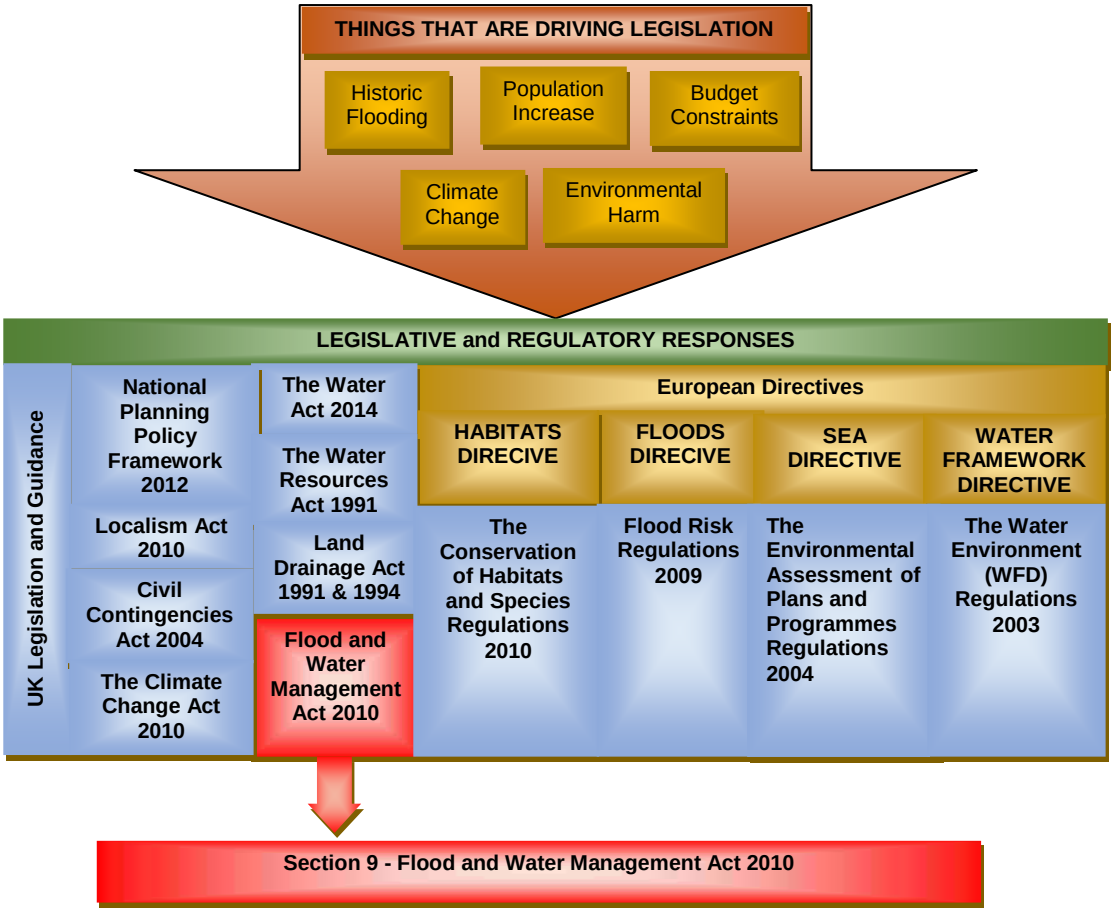
1.3 Legislative context

Some of the key legislation that provides the current context to the Flood Strategy is detailed in Table E-2 in Appendix E. Legislation on flood risk sits alongside other legislation pertaining to the water environment and has largely been prepared in response to:

- Historic flooding (such as that described in 2007).
- Increasing population and the need for new housing and infrastructure.
- The effects of climate change (more severe and frequent events that could cause flooding).
- The requirement to protect the environment from harm and where appropriate to make provision for long term improvements.
- A need to identify affordable responses and measures in circumstances where the budget is constrained.

Figure 1-1 shows the drivers, regulatory responses and legislation influencing the Flood Strategy. Summary descriptions of the legislation and guidance can be found in Appendix E. It should also be noted that the Health and Safety at Work Act 1974 and subordinate regulations such as Construction Design and Management 2015 apply to many aspects of the Flood Strategy.

Figure 1-1 Outline Figure showing other legislation affecting the Flood Strategy

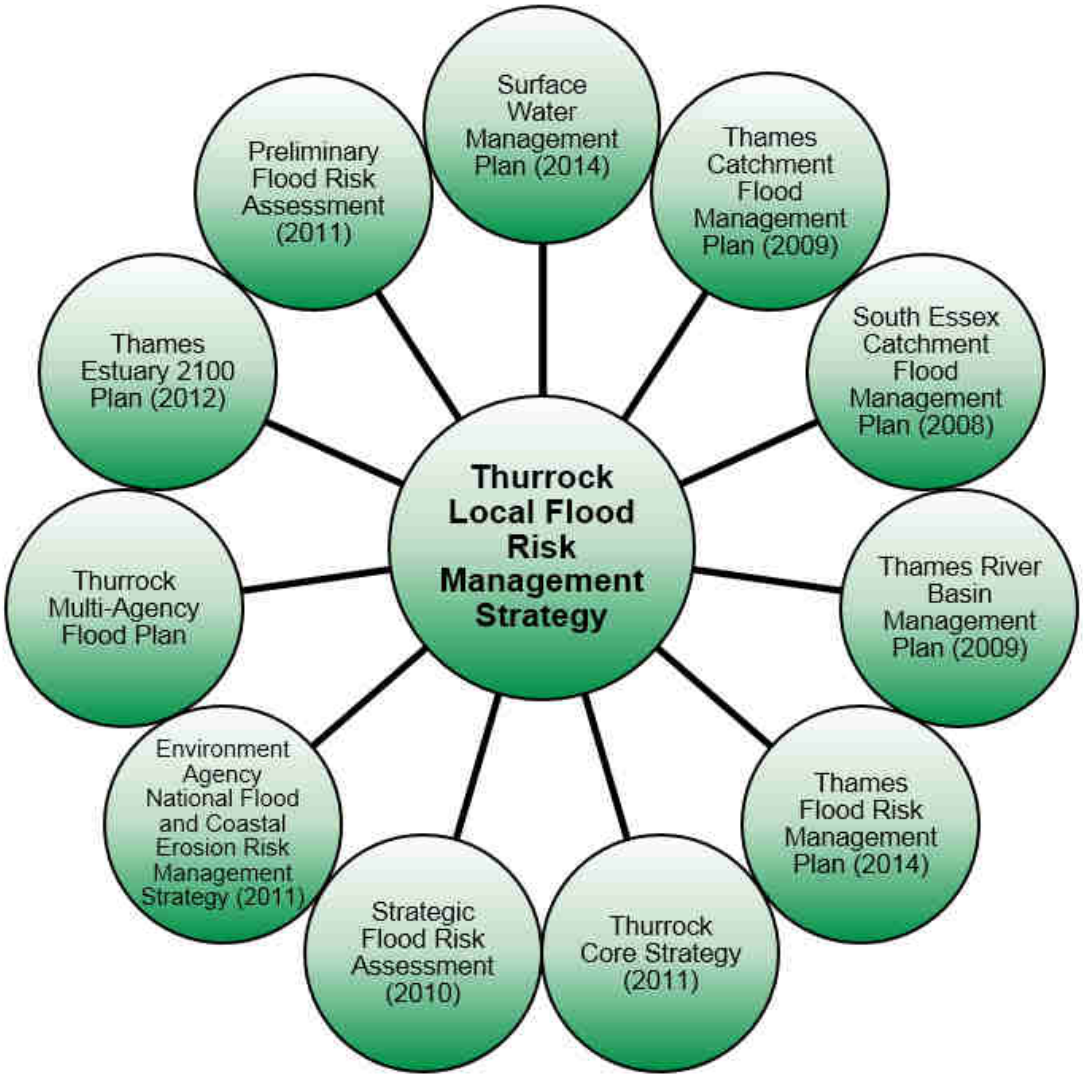


1.4 Related documents

Figure 1-2 illustrates a number of different documents that should be considered in conjunction with the Flood Strategy. The list is far from exhaustive and focuses on documents most often used by the LLFA.

These documents contain policies, plans and strategies for the strategic management of flooding and coastal erosion risk at catchment and coastal cell levels. The existing policies in these plans and strategies have been taken into consideration during the preparation of our Flood Strategy to help set the strategic direction of flood risk management within Thurrock, with particular influential policies being described in the AoCD reviews in Appendix B. We will work closely with our partner RMAs to ensure consistency with flood risk management aspirations within Thurrock.

Figure 1-2 Studies and plans informing the Strategy



Preliminary Flood Risk Assessment (PFRA): The Flood Risk Regulations required Thurrock Council (as the LLFA) to prepare and publish a Preliminary Flood Risk Assessment (PFRA) on past and future flood risk from local sources of flooding. The PFRA does not report flooding from Main Rivers and Reservoirs, which are covered by the Environment Agency, and sub-standard performance of the adopted sewer network (covered under the remit of Anglian Water). The information provided within the PFRA has helped identify areas within Thurrock considered to be at higher risk of flooding which may require actions to manage the risk. The level of local flood risk is below the threshold used to define 'Significant' flood risk and thus there is no requirement under the regulations to prepare a Flood Risk Management Plan for Local Flood Risk.

Thames Estuary 2100 Plan (TE2100): TE2100 sets out the Environment Agency's recommendations for flood risk management for London and the Thames Estuary through to the end of the century and beyond. The plan primarily looks at tidal flooding. TE2100 advocates the following policies for policy units within Thurrock:

Action Zone 5 (Middle Estuary) which includes the Swanscombe, Northfleet & Purfleet and Grays & Tilbury policy units: Policy P4 – take further action to keep up with climate change and land use change so that flood risk does not increase.

Action Zone 6 (Lower Estuary Marshes) which includes the East Tilbury & Mucking Marshes policy unit: Policy P3 – continue with existing or alternative actions to manage flood risk, accepting the likelihood of flooding will increase in the future due to climate change.

Action Zone 7 (Lower Estuary, Urban/industrial and Marshland) which includes the Shell Haven & Fobbing Marshes Policy unit: Policy P3 - continue with existing or alternative actions to manage flood risk, accepting the likelihood of flooding will increase in the future due to climate change (with secondary defence arrangements at key sites).

Our Flood Strategy has taken the TE2100 policies into account during its preparation which include setting out proposed actions in our Programme and Strategic Investment Plan to investigate and improve drainage systems in the Purfleet, West Thurrock and Tilbury areas. As we develop these actions during the Strategy period we will undertake local consultation and appraisal and identify and work with potential project partners to ensure they are consistent with the TE2100 policies.

Catchment Flood Management Plans (CFMPs): Catchment Flood Management Plans are high-level strategic plans providing an overview of flood risk across each river catchment. The Environment Agency use CFMPs to work with other key-decision makers to identify and agree long-term policies for sustainable flood risk management.

There are six pre-defined national policies provided in the CFMP guidance and these are applied to specific locations through the identification of 'Policy Units'. These policies are intended to cover the full range of long-term flood risk management options that can be applied to different locations in the catchment.

The Thames and the South Essex CFMPs have assigned a Policy 4 to the policy units covering the Thurrock area. Policy 4 applies to areas of "low, moderate or high flood risk where we [the Environment Agency and other RMAs] are already managing the flood risk effectively but where we may need to take further action to keep pace with climate change".

When developing the actions set out in the Programme and Strategic Investment Plan we will assess them against the CFMP policies to ensure a holistic, catchment approach, seeking opportunities to work in close collaboration with partner RMAs to ensure consistency in strategic flood risk management across Thurrock and neighbouring areas.

Thames River Basin Management Plan (RBMP): RBMPs identify the pressures facing the water environment in a River Basin District and the actions that will address them. The Thames RBMP sets out the current quality of water bodies in the Borough and describes the objectives for making further improvements to the ecological and

chemical quality. Thurrock lies in the South West Essex catchment of the RBMP.

As we develop the actions set out in our Flood Strategy we will seek to encompass compliance with wider environmental objectives and targets (e.g. those set out by Water Framework Directive and the RBMP) by considering whether water bodies and protected areas are suitably protected and that the implementation of any scheme where feasible enhances existing waterbodies. Further detail on how we have taken the WFD and RBMP into consideration is provided in Section 6.3.3.

Thames Flood Risk Management Plan (FRMP): FRMPs are required under the provisions of the EU Floods Directive. They identify the risk from flooding on a catchment scale and set out objectives and measures for managing that risk. They aggregate information about all sources of flooding (and coastal erosion where applicable) to better inform prioritisation, decision making and work programming. Thurrock falls within the South Essex Catchment in the FRMP. The FRMP sets out a series of overarching social, economic and environmental objectives for the South Essex Catchment, including:

- Reduce the risk of flooding to communities, where possible
- Raise community awareness and understanding of all sources of flooding
- Enhance recreation and general amenity across the catchment
- Ensure development and redevelopment in areas at risk of flooding is appropriate, does not increase flood risk and reduces risk where possible
- Promote the use of sustainable drainage systems in development to help reduce pressure on existing drainage networks
- Protect and enhance biodiversity through flood risk management schemes
- Restore naturally functioning river systems where possible
- Promote sustainable land use management to land owners across the catchment to achieve reductions in flood risk

The actions identified during the action planning process have the potential to contribute to the achievement of a number of the FRMP objectives. As we work through the Flood Strategy programme and develop our actions, we will continue to ensure our plans are consistent with the wider objectives set out in the FRMP and will work with partner RMAs to ensure a holistic, catchment approach to managing flood risk. At the time of preparation of the LFRMS the draft version of the FRMP has been through public consultation.

National Flood and Coastal Erosion Risk Management Strategy: The overall aim of the National Flood and Coastal Erosion Risk Management Strategy for England is to make provision for the

coordinated management of the risk of flooding and coastal erosion. The National Strategy sets out five National Objectives for the management of flood and coastal erosion.

The Local Objectives set out in the Flood Strategy were formulated by the Thurrock Flood Partnership with due consideration of the National Objectives, so that the objectives and actions in our Local Strategy are consistent with the National Objectives. Many of our objectives are consistent with multiple National Objectives. More detail is provided in Section 4.

Thurrock Surface Water Management Plan: Surface Water Management Plans (SWMPs) outline the preferred surface water management strategy in a given location. SWMPs are undertaken, when required, by LLFAs in consultation with key local partners who are responsible for surface water management and drainage in their area. SWMPs establish a long-term action plan to manage surface water in a particular area and are intended to influence future capital investment, drainage maintenance, public engagement and understanding, land-use planning, emergency planning and future developments. The modelling undertaken for the SWMP has been used to assess surface water flood risk in Thurrock and identify Areas of Critical Drainage (AoCD). The action plan from the SWMP has been used as the basis for the Flood Strategy Programme and Strategic Investment Plan.

Thurrock Core Strategy: The Thurrock Core Strategy and Policies for Management of Development was adopted by Thurrock Council in 2011; it set out the spatial vision, strategy and planning policies for Thurrock up to and beyond 2026. In February 2014 it was agreed a new Local Plan for Thurrock will be prepared, replacing the 2011 Core Strategy. Actions have been included within our Flood Strategy and Programme and Strategic Investment Plan to work with planning colleagues to ensure policies are in place in the new Local Plan to ensure future development does not have a detrimental impact on flooding or the wider environment, in Thurrock and neighbouring areas.

Thurrock Strategic Flood Risk Assessment (SFRA): SFRAs provide a strategic assessment of flood risk across an area. Their primary objective is to support a local planning authority undertake the Sequential Test in line with the National Planning Policy Framework and to provide an evidence base for Local Plans. It assists with the development of sustainable development policies and integrating flood risk management into the spatial planning of the area.

Thurrock Multi-Agency Flood Plan: Multi-agency flood plans are designed to aid responders in delivering an effective and coordinated response to flooding. They set out arrangements and provide information for a multi-agency response to a flood event. In addition to the actions within our Programme and Strategic Investment Plan specifically aimed at working with emergency planners and other partners to facilitate emergency planning, other actions will also contribute to emergency planning within Thurrock, through improving

understanding of flood risk as well as closer working, data sharing and cooperation between partners.

1.5 How the Local Strategy is set out

Chapter	Title / Description
2	**How will we work together to manage flood risk** *Sets out the roles and responsibilities of RMAs and non RMAs regarding flood risk, as well as the governance and scrutiny of the document.*
3	**Local flood risk** *Describes the sources of local flood risk in Thurrock and sets out how this may change in the future*
4	**Objectives and measures** *Sets out the LFRMS objectives as well as the Environment Agency's national objectives*
5	**Funding** *Details the different potential sources of funding for flood risk management*
6	**Delivery** *Describes how the Flood Strategy will be delivered over the Strategy period. Summarises borough-wide actions as well as Area of Critical Drainage specific actions. Includes some examples of where we have already carried out some of the actions.*
7	**Reviewing the Local Strategy** *Sets out how the Local Strategy will be reviewed throughout the Flood Strategy period*
8	**Environmental Assessment** *Sets out the Environmental Assessment process and summarises the key documents produced.*
Appendix A	**Annual Action Plan** *To be updated annually*
Appendix B	**Flood risk maps** *Series of flood risk maps for different sources of flooding.* *Summaries of the Areas of Critical Drainage*
Appendix C	**Communication and engagement** *Summarises the communication and engagement undertaken for the Local Strategy including questionnaire responses.*
Appendix D	**Strategic Environmental Assessment** *SEA Reports*
Appendix E	**Legislative context** *Summarises the legislation relevant to the Local Strategy*

Chapter	Title / Description
Appendix F	Ordinary watercourse enforcement protocol
Appendix G	Sustainable Drainage Systems Guidance
Appendix H	LFRMS Programme and Strategic Investment Plan

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2 How will we work together to manage flood risk

2.1 Introduction

The roles and responsibilities of Risk Management Authorities are clearly set out in the relevant legislative documents and guidance provided in Appendix E.

This chapter provides an overview of these roles and responsibilities, as well as information on how we will work with other organisations to sustainably manage flood risk, both now and into the future.

2.2 Roles and responsibilities

2.2.1 Thurrock Council

Our role in managing flood risk was extended with the introduction of the Flood and Water Management Act 2010, when we became an LLFA. The new duties for us as an LLFA include:

- Local Flood Risk Management Strategy: We must develop, maintain, apply and monitor a Flood Strategy (this document) to outline how we will manage flood risk, identify areas vulnerable to flooding and target resources where they are needed most.
- Flood Investigations: When appropriate and necessary we must investigate and report on flooding incidents in Thurrock.
- Register of Flood Risk Features: We must establish and maintain a register of structures or features which, in our opinion, are likely to have a significant effect on flood risk in Thurrock.
- Designation of Features: We may exercise powers to designate structures and features that affect flood risk, requiring the owner to seek consent from the authority to alter, remove or replace it.
- Consenting: When appropriate we will perform consenting of works on ordinary watercourses.
- Sustainable Drainage Systems (SuDS): We have a statutory consultee role for assessing and commenting on surface water drainage proposals on large developments (developments of 10 properties or more). Guidance on SuDS is provided in Appendix G.

When carrying out our flood risk management role we must co-operate with other relevant authorities and have actively participated in the formation of new partnerships with other RMAs (we lead the Thurrock Flood Partnership and attend the Essex Flood Officers' Group).

The changes also mean we must work more efficiently and effectively, so where necessary all strategies, proposals, policies and actions in Thurrock take consideration of the objectives contained in this Flood Strategy.

In particular, we will coordinate our actions with other departments, including Highways, Development Management and Emergency Planning, as well as other RMAs; to make best use of available resources, prevent inappropriate development and support and inform preparations for flood emergencies, tactical responses and recovery following flood events.

2.2.2 Thurrock Flood Partnership

The Thurrock Flood Partnership was set up in 2014, as a central point where flood risk issues in Thurrock are reviewed and appropriate action agreed. The Partnership is made up of representatives from Council departments as well as key stakeholders such as the Environment Agency, Essex Fire and Rescue, Anglian Water and neighbouring LLFAs.

2.2.3 Environment Agency and flood risk

The Environment Agency has a strategic overview role for the management of flood risk from all sources, as well as responsibilities for the prevention, mitigation and remedying of flood damage for Main Rivers, the Sea and reservoirs.

The EA is responsible for developing, maintaining and monitoring a National Flood and Coastal Erosion Risk Management Strategy and this Flood Strategy has been developed to be consistent with this document.

The EA has permissive powers to work on Main Rivers and the sea to manage flood risk. However, it does not have to maintain or construct new works. It is also unlikely to maintain a watercourse to improve the amenity of a river or to stop erosion that does not affect flood risk.

The EA enforces the Reservoirs Act 1975. Although the responsibility for reservoir safety lies with the reservoir owners (the Act refers to owners as 'undertakers'), the EA is responsible as the Enforcement Authority of reservoirs in England and Wales that are greater than 25,000m^3 and must ensure flood plans are produced for specified reservoirs where the risk to people would be high if there was a problem with the dam.

The EA is also responsible for establishing and maintaining a register of reservoirs. The FWMA introduced the possibility that the regulations applying to reservoirs of 25,000 m^3 capacity or greater could also apply to smaller reservoirs of greater than 10,000 m^3 capacity, but on the basis of the available information Defra decided in February 2015 that it is not possible to make this change without potentially introducing unjustifiable costs[1]. Instead Defra has commissioned further research to determine whether the decision on regulation should be changed in the future.

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/406700/reservoir-safety-201502.pdf

The EA issues flood warnings on sections of Main River and the coast, as well as monitoring and supporting emergency responders when flooding occurs.

Under the Water Resources Act 1991 and through their Land Drainage and Sea Defence Byelaws, the EA is responsible for controlling works which affect Main Rivers and flood defences.

The EA provide advice to Government on flood and coastal erosion risk as well as technical and administrative support to the Regional Flood and Coastal Committees (RFCC).

The EA also provide support to LLFAs by providing data and guidance on assessing, planning and carrying out flood risk management for flooding from ordinary watercourses, surface runoff and groundwater; for example, the updated Flood Map for Surface Water and Areas Susceptible to Groundwater flooding datasets, climate change guidance, and **flood and coastal erosion risk management appraisal guidance**. Further information on guidance documents for LLFAs, other RMAs and local authorities is provided on the **Defra website**.

The Environment Agency has many other functions, in particular with respect to water quality, the environment, climate change and sustainability and which will also involve partnership working with Thurrock.

2.2.4 Water and sewerage undertakers

Anglian Water is responsible for managing the risk of flooding from foul and surface water sewers. These responsibilities may be carried out in partnership with others, for example working with developers or landowners to reduce input into sewers through sustainable drainage. Water and sewerage companies have the following flood risk management responsibilities

- To respond to flooding incidents involving their assets
- To maintain a register of properties at risk of flooding due to overloading of sewerage infrastructure and undertake improvements to alleviate sewer flooding problems
- To provide, maintain and operate public sewer systems
- To cooperate with other RMAs
- Have a duty to adopt private sewers

Essex and Suffolk Water are responsible for flooding from burst water mains in its area. Water and sewerage company businesses are regulated by the Water Services Regulation Authority (OfWAT). OfWAT's role is to monitor and review the performance of the Water and Sewerage companies so they meet customer requirements

2.2.5 Highways Authority

Thurrock Council as Highways Authority is responsible for the provision and management of highways drainage under the Highways Act

(1980). This excludes motorways and trunk roads that are the responsibility of the Highways England.

Owners of land adjoining a highway have a common law duty to maintain ditches.

2.2.6 Infrastructure and utility providers

These may include energy companies, telecommunication companies, Network Rail and Highways England. Although not RMAs, assets owned by these providers may play an important role in flood risk management, for example ownership and maintenance of culverts. Highways England is currently investigating and consulting on options for a new Lower Thames crossing to the east of London. This may have a potential impact on the Thurrock area as well as involving significant investment.

2.2.7 Neighbouring LLFAs

Neighbouring authorities are responsible for carrying out duties under the FWMA within their own authority boundaries. They have a mutual duty to cooperate with neighbouring LLFAs in the undertaking of flood risk management duties and to address cross boundary flood management issues. Neighbouring LLFAs for Thurrock include Havering London Borough Council, Bexley London Borough Council, Medway Borough Council, Kent County Council and Essex County Council.

In addition to working with neighbouring LLFAs through the Thurrock Flood Partnership, Thurrock Council is a member of the Essex Flood Partnership with the aim of contributing to a strategic overview of flooding matters in Essex.

2.2.8 Riparian owners

Owners of land adjoining a watercourse, 'riparian owners', have certain rights and responsibilities including:

- maintaining river beds and banks;
- allowing the flow of water to pass without obstruction; and
- controlling invasive alien species e.g. Japanese knotweed.

More information about riparian owner responsibilities can be found in the Environment Agency publication **'Living on the Edge' (2012)**.

2.2.9 Property owners and residents

Flooding can occur despite all organisations meeting their responsibilities. It is therefore important that householders and businesses who are at risk of flooding take steps to protect their property. This may include ensuring the property is protected from flooding, is resilient to flooding or that preparations have been made in the event of a flood.

A public survey was undertaken in January 2015 to allow residents to provide information on their own experiences of flooding within

Thurrock as well as their thoughts on management of flood risk, flood risk funding and what actions they would consider undertaking to manage flood risk.

Members of the public were also given the opportunity to comment on this Flood Strategy during the public consultation that took place in summer 2015.

2.3 Governance and scrutiny

2.3.1 Thurrock Overview and Scrutiny Committee

The Flood Strategy will be reviewed and approved by Cabinet and subject call-in through the Council's scrutiny procedures. Scrutiny ensures that the decision making process is clear and accessible to the public, allowing members of the community and Councillors to influence policy development and improve public service delivery.

2.3.2 Thurrock Flood Partnership

The Thurrock Flood Partnership meets twice a year where flooding issues in Thurrock are reviewed and appropriate action agreed. The aim of the Partnership is to ensure a long-term sustainable approach to flood management in Thurrock, ensuring appropriate accountability and co-ordination between relevant stakeholders.

2.3.3 Key Stakeholders

The EA, Essex Fire and Rescue Service and Anglian Water have contributed to the Flood Strategy; enhanced partnership working will be important for delivery of the measures identified in the Action Plan (see Appendix A).

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3 Local Flood Risk

3.1 What is flood risk?

A flood as formally defined in the FWMA:

'includes any case where land not normally covered by water becomes covered by water' and can be the result of water emanating from a number of sources.

Flooding can be caused by a range of sources; including heavy rainfall, rivers overflowing or banks being breached, dams overflowing or being breached, tidal waters, or groundwater. A flood does not include water from any part of the sewerage system unless it is wholly or partially caused by an increase in the volume of rainwater (including snow and other precipitation) entering or otherwise affecting the system. Nor does it include flooding caused by a burst water main (since these events are looked after by Essex and Suffolk Water).

In the context of the Flood Strategy, local flooding is from surface runoff, groundwater and ordinary watercourses.

Flood risk

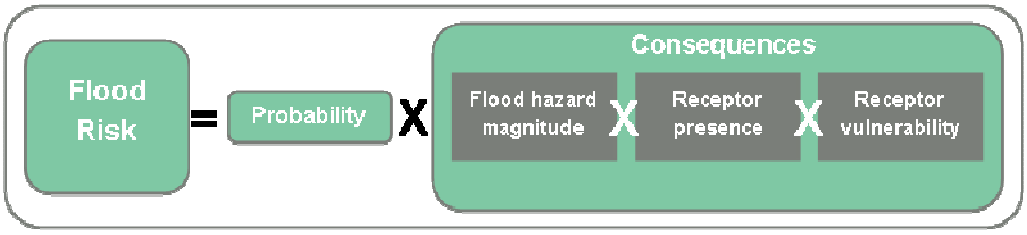
Flood risk can be described as the combination of the chance or probability of a flood occurring (often expressed as a chance in any one year or Annual Exceedance Probability AEP) and the scale of its potential consequences or impact (for example, the effect on people, homes, infrastructure and the environment).

It is possible to define flood risk as:

Flood Risk = (Probability of a flood) x (scale of the consequences)

This definition is illustrated in Figure 3-1.

Figure 3-1 Flood risk definition



Using this definition it is seen that flood risk can be increased by

- Increasing the probability or chance of a flood being experienced
- Increasing the severity of the consequences by
    - Increasing the flood hazard magnitude
    - Increasing the number of receptors affected
    - Increasing the vulnerability of the receptors

3.2 History of flooding in Thurrock

The Thurrock PFRA presents a history of flooding in Thurrock. The South Essex area has suffered two major flood events; in 1928 and 1953. In 1953 a major storm surge coincided with a high spring tide and resulted in wide spread flooding. Flood levels at Tilbury reached six feet above its predicted level and inundation depths were approximately 2-3 metres. Flood defences were improved in response to these major floods, including barriers at Purfleet, Grays, Tilbury, and Tilbury Fort amongst others. Many kilometres of raised walls in both the upper and lower reaches of the Thames Estuary were also erected. Flood warning systems have also been improved.

Other incidents of flooding in Thurrock since 1953 include a period between December 2002 and January 2003, in Bulphan and in Tilbury, and most recently in 2014 in Tilbury.

3.3 What are the local sources of flooding?

Thurrock is affected by flooding from a number of local sources including

- Surface water (overland flow and surface runoff)
- Ordinary watercourses
- Sewer (from pipe, pumping station and manhole systems)
- Groundwater

In addition to these local sources, Thurrock is also at risk from Main River and the sea.

Flooding can occur due to a combination of different sources, so it is important that our Flood Strategy describes all types of flooding.

This section of the Flood Strategy describes the sources of local flooding that result in the most notable risks.

3.3.1 River and Sea flooding

Flooding from rivers (fluvial) and channels happens when they overflow and overtop. This type of flooding often occurs following heavy or prolonged rainfall, which causes river levels to increase and the river channels not having enough capacity to contain the flow. Fluvial flooding can also be the result of blockages or obstructions.

Flood risk in rivers can also be affected by the sea level as this can cause high water levels along rivers that flow into the sea. This effect is called ‘tide locking’ and in Thurrock can be caused by high water levels in the Thames Estuary. High tide levels that increase flood risk can happen when normal tide levels are raised due to the effects of high pressure weather systems and high winds resulting from storms.

Rivers in England and Wales are divided into two categories; Main Rivers or ordinary watercourses.

As LLFA, Thurrock Council is responsible for the management of flood risk from ordinary watercourses whilst the EA is responsible for the management of flood risk from Main Rivers.

The location of recorded ordinary watercourses in Thurrock is shown in Figure 3-2.

'Ordinary Watercourses' are generally smaller rivers, ditches and streams such as Running Water Brook which flows through Belhus Woods Country Park on the western boundary of the Borough. These watercourses tend to form the upper reaches of watercourses before they become Main River; or are small, unnamed watercourses and drains that flow into Main Rivers. In the Borough's marshland they also form an extensive network of channels that provide storage when gravity outfalls are tide locked such as within the Tilbury and Aveley Marshes.

The flood risk from the majority of these ordinary watercourses is not covered by the Environment Agency's flood maps; however, the uFMfSW can give an indication of possible flood extents.

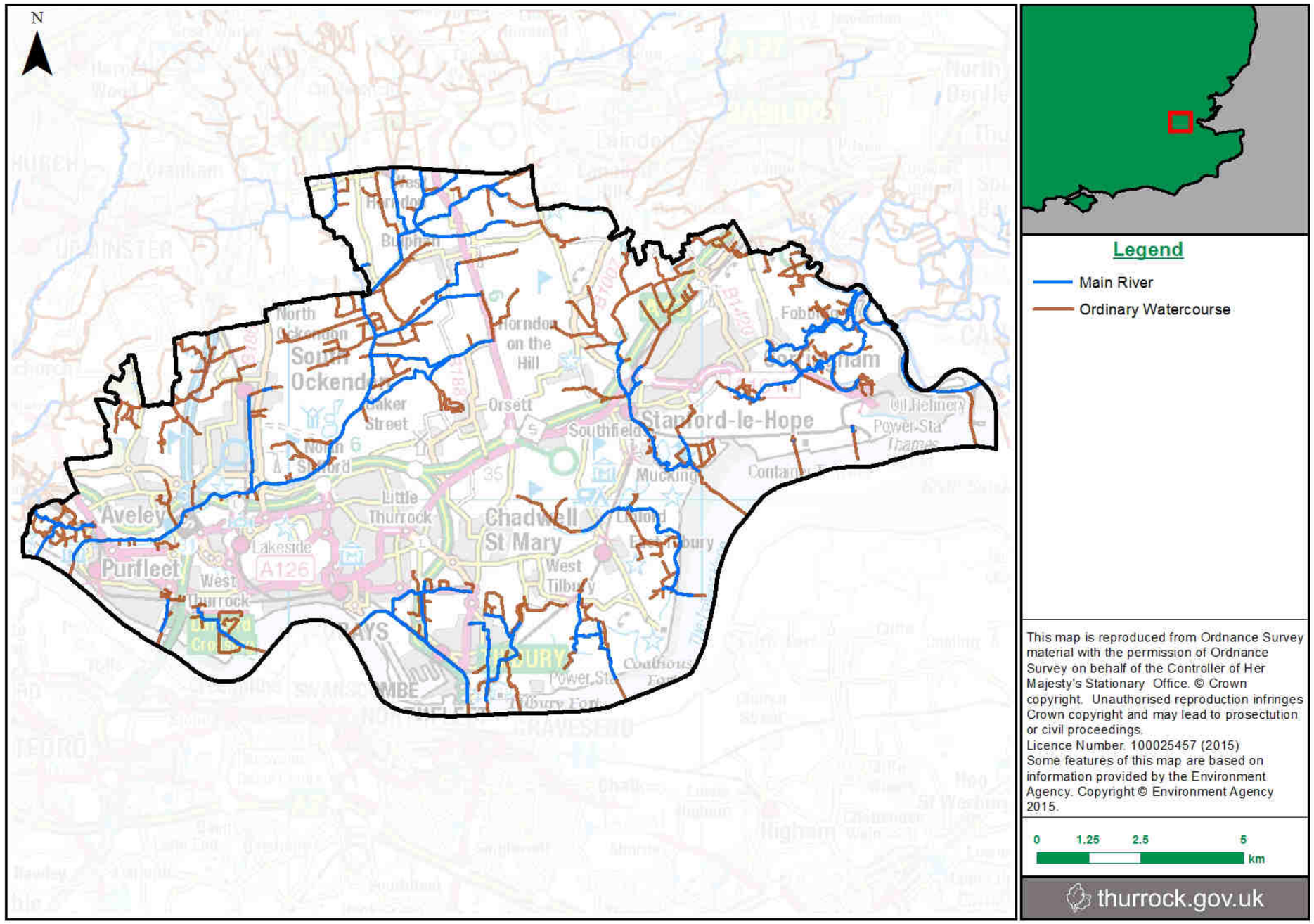
The uFMfSW indicates that the ordinary watercourses which are likely to have the biggest flood extents are primarily located in the Orsett Ward, forming the network of drains in the upper reaches of the Mar Dyke catchment. Also, the Homesteads ward where they flow through the north of Stanford-le-Hope, and in the Corringham and Fobbing Ward where they form a network of drains in the Fobbing Marshes. However, with the exception of Stanford-le-Hope, these wards are less densely populated and hence, fewer properties are likely to be at risk.

The responsibility for maintenance of ordinary watercourses falls to riparian owners who own land on either bank. Thurrock Council is only responsible for ordinary watercourses where land on either bank is in Council ownership or where historical agreements have been made.

Thurrock Council, as the LLFA, has certain permissive powers for enforcement on watercourses that have not been designated as Main River, as well as to undertake flood defence works under the Land Drainage Act 1991 and Public Health Act.

Further information on the Council's ordinary watercourse enforcement protocol is provided in Appendix F.

Figure 3-2 Ordinary watercourse locations in Thurrock



3.3.2 Surface water flooding

Surface water flooding is often referred to as 'pluvial' flooding. This flooding occurs when heavy rainfall exceeds the capacity of local drainage networks, resulting in water flowing across the ground or ponding in low lying areas and localised depressions. Thurrock has experienced localised pluvial flooding, particularly during episodes of summer extreme rainfall in 2007, 2008, 2009 and 2013/14. These events led to pluvial flooding and were a reminder of the fragility of local infrastructure and existing drainage systems to deal with heavy rainfall.

Whilst the Council in its capacity as LLFA has overall responsibility for leading on the management of surface water flood risk, no single organisation has responsibility for all surface water flooding infrastructure. Different aspects of the drainage system are the responsibility of a range of organisations including the Highway Authority (Thurrock Council), Anglian Water, riparian owners and Highways England.

Surface water drainage in the north of the Borough is directed to field and roadside drainage ditches that discharge into local watercourses. The maintenance of these networks falls primarily to riparian owners. Aveley, South Ockendon, Orsett and Horndon on the Hill are served by a separate surface water and foul water system. Bulphan has a formal foul water network.

The surface water system in the south of the Borough is discharged either through World's End Pumping Station (which serves Tilbury) or via gravity outfalls with non-return valves on the seaward side. The West Tilbury Marshes are an extensive system of drainage channels and ditches that temporarily store local surface water runoff prior to discharge through an outfall.

The Environment Agency, in partnership with LLFAs, has produced the updated Flood Map for Surface Water (uFMfSW) which shows the locations where surface water flooding is predicted to occur. This mapping is available to view on the EA's website.

In order to better understand surface water flooding in Thurrock we have undertaken further assessment through an update to the 2014 Surface Water Management Plan (SWMP). The results from the updated SWMP modelling have been used alongside the uFMfSW in our assessments and mapping during the preparation of our Flood Strategy. An overview map of surface water flood risk across the Borough is provided in Figure 3-3.

The mapping shown within this report is intended to identify broad areas which are more likely to be vulnerable to surface water flooding. Working with our partners we are able to undertake more detailed analysis in areas which are most vulnerable to surface water flooding. It should be noted that these maps only show the predicted likelihood of surface water flooding (this includes flooding from drains, small watercourses and ditches that occurs in heavy rainfall in urban areas)

for defined areas. Due to the coarse nature of the source data used, the maps are not detailed enough to define risk for individual addresses. Individual properties therefore may not always face the same chance of flooding as the areas that surround them.

Surface water flood risk is widespread across Thurrock, with the highest risk located in the more urbanised areas of the administrative area, and in areas where water ponds behind railway embankments such as at Balstonia in Stanford-le-Hope and the railway embankment as it runs through Grays Riverside and West Thurrock and South Stifford wards.

The surface water flooding shows a significant amount of transport infrastructure in Thurrock to be at risk from surface water flooding including the A126 (London Road), and the A13

A summary of the number of properties predicted by the modelling to be at risk from surface water flooding in each Thurrock ward is shown in Table 3-3.

Aveley and Uplands ward: surface water flood risk is mainly concentrated around Aveley and Purfleet Industrial Park. Risk of flooding to property is relatively low, in comparison with other wards, with flooding predominantly affecting roads including the A13, Purfleet Road, High Street and Stifford Road, as well as roads around Purfleet Industrial Estate.

Belhus ward: surface water flood risk is mainly concentrated around South Ockendon and the rural area to the east of the ward. Risk of flooding to property is relatively low in the 3.33% AEP and 1% AEP events; however, the number of properties at risk increases considerably in the 0.1% AEP event. In addition to property, surface water also affects roads in this ward including the B1335 (Stifford Road) and South Road as well as numerous residential streets in South Ockendon. The road leading to Arcadia is also at risk of surface water flooding which could lead to this area becoming cut off in a flood event.

Chadwell St Mary ward: surface water flood risk mainly affects property and smaller roads within Chadwell St Mary. The surface water mapping shows Brentwood Road to be at significant risk with flooding potentially affecting much of its length, as is the Chadwell By-Pass. Risk to property is higher in the north and the south east of the ward around residential roads located off of Brentwood Road, Heath Road and Linford Road. Flooding is also shown to affect the industrial estate off of Sandy Lane.

Surface water flooding in Orsett Heath is mainly confined to Parm Road and Gowers Lane.

Chafford and North Stifford ward: surface water flood risk predominantly affects the south of the ward at Chafford Hundred with many smaller roads affected. Properties are at risk throughout Chafford Hundred, with higher concentrations at Catalina Avenue and Bark Burr Road, and Frobisher Gardens and Sachfield Drive.

The A1306 is also affected along some of its length as it passes through this ward, particularly at the roundabout junction with the A1012.

Corringham and Fobbing ward: this ward is predominantly rural; although the mapping shows large areas of surface water flood risk, the majority of the risk is to rural land where there are a few isolated properties. The main urban area within this ward is the eastern areas of Corringham. Surface water flood risk to properties is concentrated around Lampits Hill, Fobbing Road and Giffords Cross Avenue, with other residential streets also affected.

The Stanford-le-Hope by-pass is significantly affected by flooding as it passes through this ward, particularly around the junction with the A176, B1464 and B1420.

East Tilbury: similarly to Corringham and Fobbing ward, this ward is predominantly rural, therefore much of the risk is to rural land and isolated properties. The main urban areas are East Tilbury and Linford, where a number of properties are shown to potentially be at risk. These properties are predominantly located in East Tilbury.

Although main road transport routes are shown to be largely unaffected by surface water flooding, the mapping does show surface water backing up behind the railway embankment in several locations in this ward.

Grays Riverside ward: Grays Riverside ward is shown to be at significant risk of surface water flooding with a large number of properties at risk. Risk of surface water flooding is widespread throughout the ward; however, there is a concentration of risk around London Road and Hathaway Road. The concentration of risk along London Road may potentially be a result of surface water flooding backing up behind the railway embankment.

Grays Thurrock ward: similar to Grays Riverside, the Grays Thurrock ward is also at significant risk of flooding, with surface water risk widespread throughout the ward. There is a noticeable risk to Hathaway Road and properties along its length. An area of surface water is also shown to build up behind the railway embankment near Bridge Road.

Little Thurrock Blackshots ward: the Little Thurrock Blackshots ward is less densely urbanised than the Grays Thurrock and Riverside wards hence less properties are shown to be at risk from surface water flooding. Surface water flooding is concentrated along residential roads. There is also some flooding shown to King Edwards Drive, Blackshots Lane and the A1013. The mapping also shows an area of land north of the Lodge Lane roundabout where surface water flooding ponds.

Little Thurrock Rectory ward: despite the urban nature of this ward the number of properties at risk from surface water flooding is relatively low. There is a band of surface water flood risk through the centre of the ward; however, this affects a relatively low number of properties.

The main areas of risk are areas off of Southend Road in the north of the ward, and Rectory Road in the south of the ward. Of the main transport routes, the B149 and A126 are shown to be affected by surface water flooding along much of their length.

Ockendon ward: the number of properties at risk from surface water flooding in Ockendon ward is relatively low due to the ward being predominantly rural. Much of the surface water risk in this ward is located to the east and west in the rural areas where it is mainly isolated properties at risk. The main urban area at risk is Ockendon where surface water flooding is fairly evenly distributed throughout the area.

Although surface water is not shown to significantly affect the M25, mapping shows ponding of surface water either side of the motorway embankment.

Orsett ward: one of the largest wards in Thurrock, Orsett ward is predominantly rural. The mapping shows surface water flooding is widespread throughout the ward due to the drainage network in the upper reaches of the Mar Dyke catchment. The main urban areas at risk from surface water flooding are Bulphan, Horndon on the Hill, Orsett and Southfields. Transport routes shown to be at risk from surface water flooding include the A128 and the Stanford-le-Hope bypass.

South Chafford ward: although quite densely urbanised, the risk of surface water flooding in this ward is relatively low. The majority of the risk is located in the west and the south of the ward.

Stanford East and Corringham Town ward: much of the surface water flood risk to this ward is located along the ward boundaries, particularly the boundary with The Homesteads ward along the entire length of Southend Road as it runs through the ward. Other areas shown to be at risk from surface water flooding is north of the A1014 by the roundabout junction with The Sorrells and near Gifford Cross.

Stanford-le-Hope West ward: with the exception of Stanford-le-Hope in the north-west, this ward is predominantly rural. The main surface water risk is to Stanhope Industrial Park and the town of Stanford-le-Hope. The surface water flood risk in Stanford-le-Hope is concentrated in the areas either side of the railway embankment where it runs through the town, along the Stanford Brook and areas around Corringham Road. At Stanhope Industrial Park, surface water is shown to build up either side of the railway embankment. The A1014 (The Manorway) is also shown to be at risk from surface water flooding along much of its length in this ward.

Stifford Clays ward: the majority of surface water flood risk to property is located in the south of the ward, south of the A13. North of the A13 is predominantly rural with a few isolated properties. The level of surface water flood risk to property in this ward is relatively low; whilst risk to roads is fairly widespread across the ward, the risk is

largely confined to the roads, with the majority of property risk located in the southern most extent of the ward in side roads off of Long Lane.

The Homesteads ward: the Homesteads ward has the highest number of properties at risk from surface water flooding of all the wards in Thurrock. Mapping shows the risk is concentrated in two bands running north east to south west through the ward. The first band runs along Southend Road, the second band runs from the Stanford-le-Hope bypass, through Balstonia towards the A1014. In addition to the properties at risk, transport routes including the A13 and A1014 are also shown to be at risk. The mapping also shows surface water ponding in a number of locations behind the railway embankment to the south of the A13.

Tilbury Riverside and Thurrock Park ward: Surface water flood risk in this ward is mainly located in Tilbury, Tilbury Docks and Thurrock Park. Tilbury Power Station is also shown to be at slight risk from surface water flooding.

Of the transport networks in the ward, the mapping shows some risk to the railway into Tilbury Docks. The main rail route is largely unaffected, but surface water is shown to pond either side of the railway embankment in a number of places. Dock Road and St Chads Road (A126) are largely unaffected.

Tilbury St Chads ward: despite this ward being quite rural, there is a large number of properties potentially at risk from surface water flooding. These properties are mostly located throughout Tilbury. Dock Road and St Chads Road (A126) are largely unaffected; however, mapping shows Marshfoot Road to be at risk from surface water flooding along the majority of its length.

West Thurrock and South Stifford ward: surface water flood risk in this ward is quite high due to the large number of residential and non-residential properties. Surface water is shown to pond around a number of the industrial units throughout the ward, as well as either side of the railway embankment along much of its length. Although the A282 is shown to be largely unaffected, other main routes including the A1090, A126 and the Purfleet Bypass are shown to be at risk from surface water flooding.

Table 3-1 Number of properties at risk – surface water flooding*

Ward	Surface water risk		
	1 in 30 year	1 in 100 year	1 in 1,000 year†
Aveley and Uplands	36	36	129
Belhus	0	0	221
Chadwell St Mary	174	183	408

Ward	Surface water risk		
	1 in 30 year	1 in 100 year	1 in 1,000 year†
Chafford and North Stifford	87	93	216
Corringham and Fobbing	101	102	294
East Tilbury	118	122	201
Grays Riverside	375	386	818
Grays Thurrock	285	313	623
Little Thurrock Blackshots	29	30	158
Little Thurrock Rectory	197	207	319
Ockendon	0	0	385
Orsett	65	68	503
South Chafford	94	94	209
Stanford-le-Hope West	261	277	476
Stanford East and Corringham Town	107	112	383
Stifford Clays	35	35	128
The Homesteads	256	279	955
Tilbury Riverside and Thurrock Park	147	152	367
Tilbury St Chads	269	284	662
West Thurrock and South Stifford	542	552	901
Total	**3,178**	**3,325**	**8,356**

* property counts are based on results from the updated SWMP modelling. As the updated SWMP modelling did not cover the entire Thurrock area, the uFMfSW was used for property counts in the areas not covered by the SWMP results. Properties were counted based on the following criteria, in line with the property count methodology used with the uFMfSW.

- Flood depths are greater than 150mm and 50% or greater of the wetted perimeter of the property was flooded; or
- Flood depths are greater than 300mm and 25% or greater of the wetted perimeter of the property was flooded.

† The updated SWMP modelling was not undertaken for the 1 in 1,000 year; therefore the results from the uFMfSW were used for this probability event.

14 Areas of Critical Drainage (AoCD) were identified as part of the original SWMP (Figure 3-3).

AoCDs are a discrete geographical area where multiple sources of flood risk may cause flooding during severe weather, affecting people, property or infrastructure. The locations covered by AoCDs in Thurrock include Purfleet, West Purfleet, West Thurrock Lakeside,

Grays, Little Thurrock Marshes, Tilbury, East Tilbury, Stanford-le-Hope, Bulphan, Orsett, South Ockendon, Aveley and West Thurrock. Further details of these AoCD including maps and numbers of properties at risk are provided in Appendix B.

The South Essex CFMP provides details of past surface water flood events. Between December 2002 and January 2003, surface water flooding was recorded to have affected several houses in Bulphan in the upper Mardyke valley, as well as several houses in Tilbury.

Figure 3-3 Surface water flood risk in Thurrock

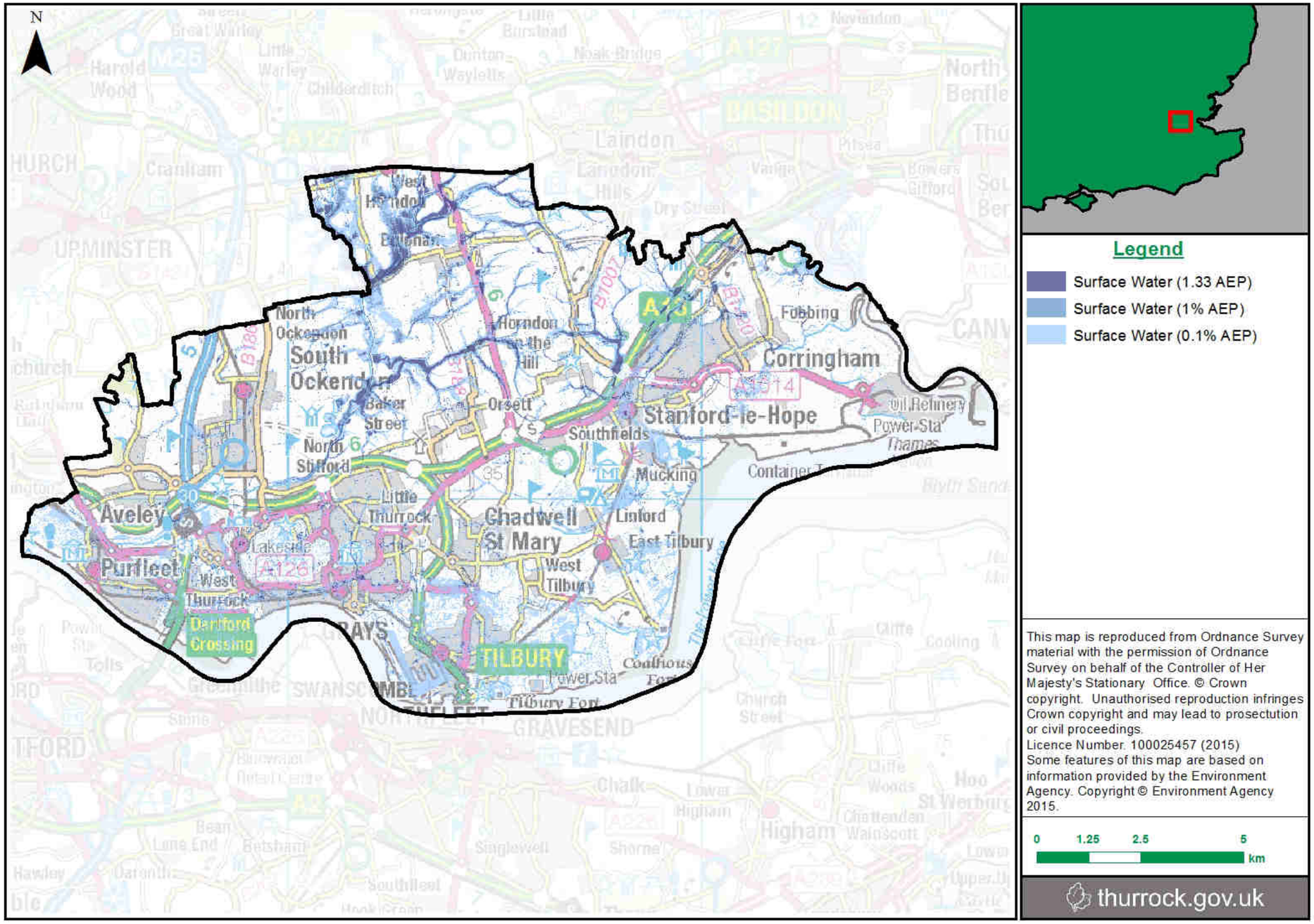


Figure 3-4 Areas of Critical Drainage (AoCD) in Thurrock

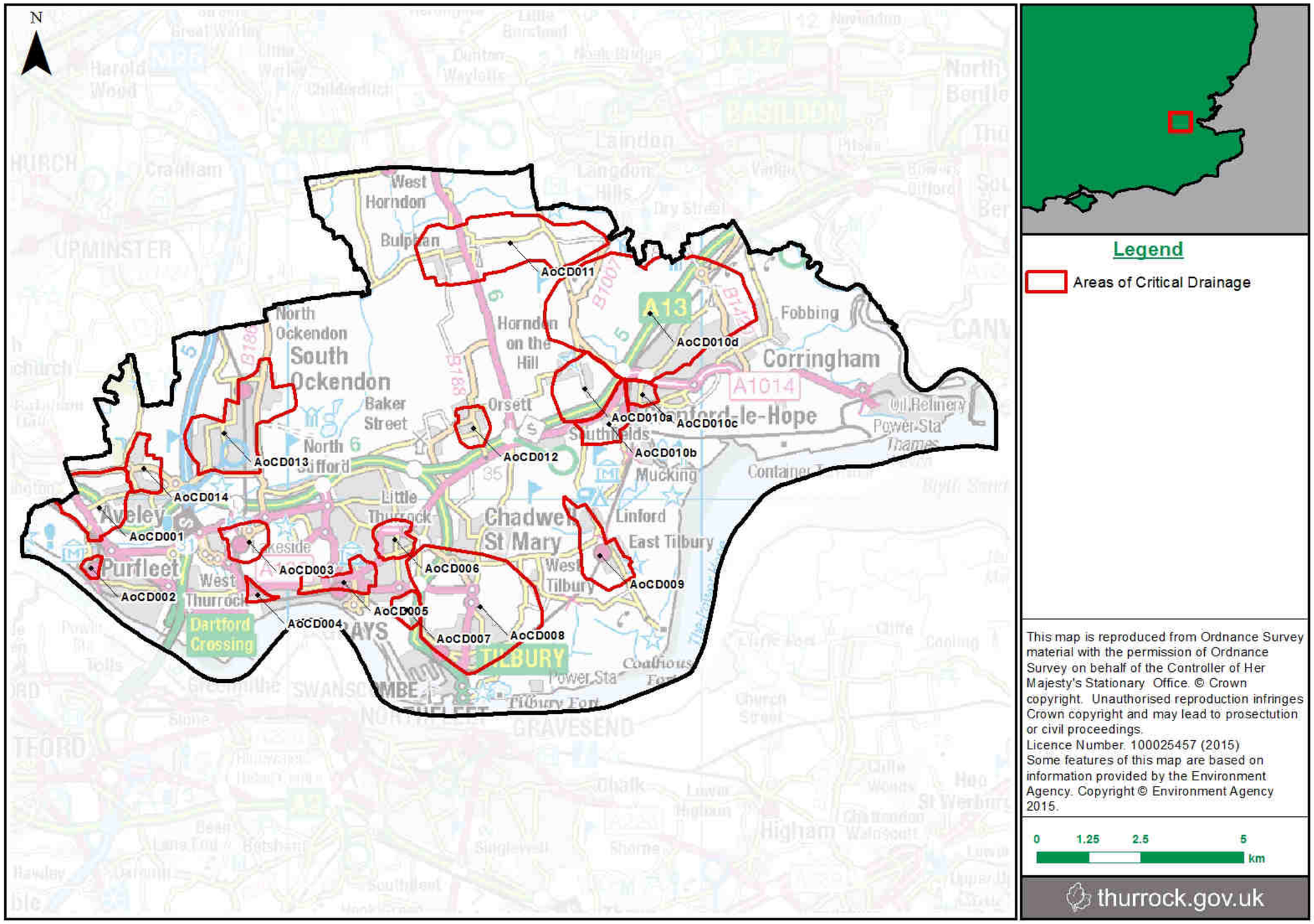
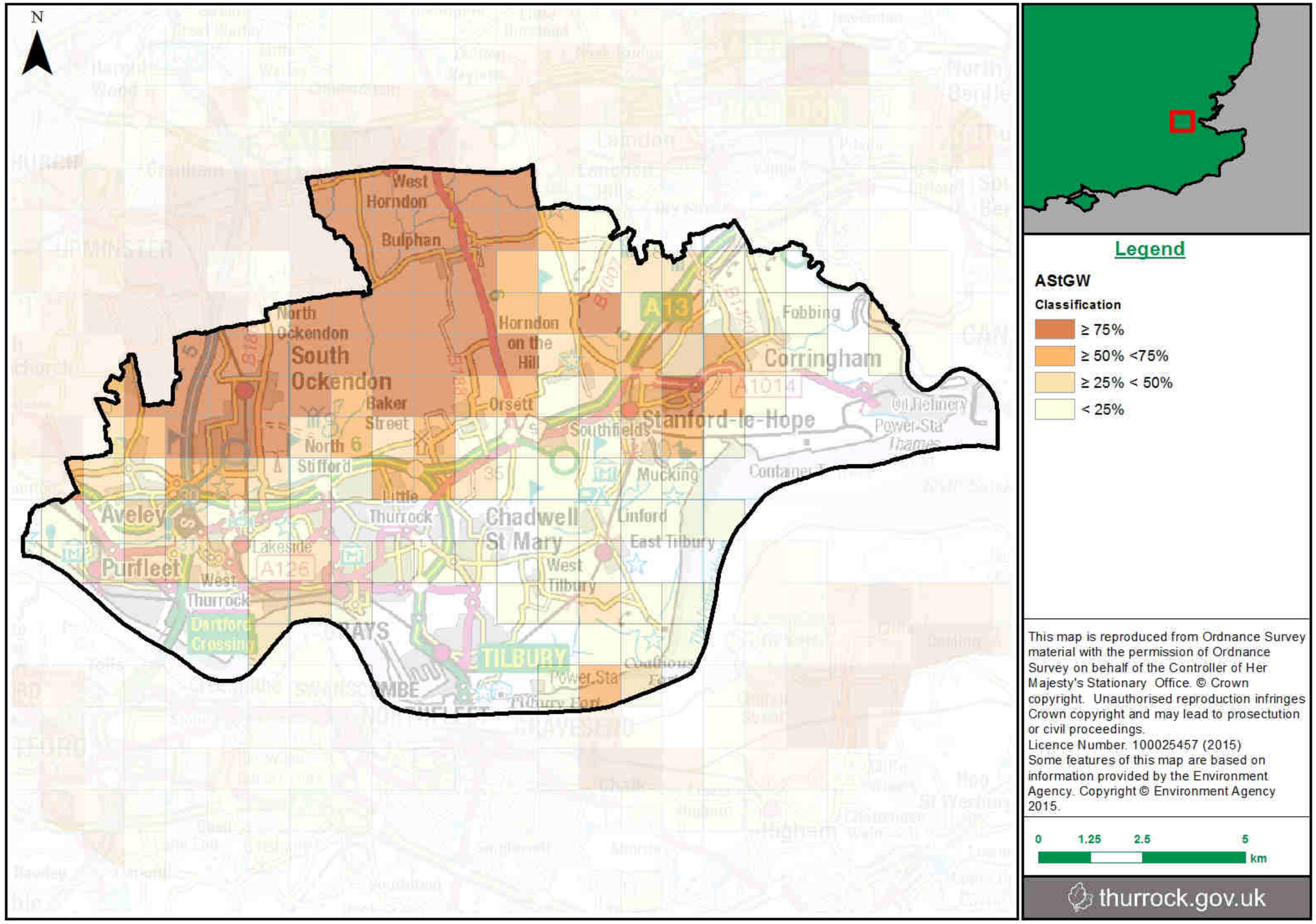


Figure 3-5 Areas Susceptible to Groundwater (AStGW)



3.3.3 Sewer flooding

For the purposes of the Flood Strategy, sewer flooding occurs when there is a lack of capacity in the sewer drainage network and it becomes overwhelmed by the volume and rate of rainfall which results in flooding on the ground.

In very bad weather conditions there is a risk that sewer systems can become overwhelmed and result in sewer flooding. In some instances, flooding from sewers can be a combined issue such as heavy rainfall resulting in surface water flooding that surcharges the underground pipe network. In this circumstance, it is the responsibility of several RMAs working together to resolve the problem. It can also be caused by high groundwater levels increasing the flow of groundwater into sewer systems and so reducing their capacity to discharge wastewater flows from houses and industry.

Sewer flooding can also be the result of blocked or damaged pipes. If these are owned by a water utility company then it is the company's responsibility. Private sewers are the responsibility of the landowner; the ownership and responsibility for surface water sewers, which can sometimes also be classified as Main River or ordinary watercourse (piped in watercourses), can be more complicated and sometimes difficult to determine.

There is also potential within Thurrock for drainage systems to surcharge due to outlets becoming submerged as a result of high river levels and this can also be the result of the effect of high tide levels. When this occurs, water is unable to discharge into the river and backs up along the sewer. Water will overflow onto streets and potentially into houses if the capacity of the sewer system is subsequently exceeded.

The South Essex CFMP highlights sewer flooding as a problem in Stanford-le-Hope, Purfleet and Tilbury due to inadequate maintenance of sewerage infrastructure leading to blockages, or systems being overwhelmed by the quantity of discharge. The Thurrock Water Cycle Study (2010) also identifies Grays and Bulphan as areas that have been affected by sewer flooding in the past.

3.3.4 Groundwater flooding

Groundwater flooding is the result of water rising up from the underlying aquifer or from water flowing from ephemeral springs. It tends to occur following periods of prolonged wet weather when the water table is high; areas most at risk are often low-lying where the water table is more likely to be at a shallow depth.

Groundwater levels may also impact on other types of flooding. Whilst high groundwater levels may not lead to widespread groundwater flooding, they have the potential to exacerbate the risk of pluvial and fluvial flooding by reducing capacity for rainfall infiltration and increasing surface runoff. The naturally high water table in the

reclaimed marshes in Tilbury may intensify flood risk due to the frequently saturated ground resulting in increased runoff.

Groundwater flooding is usually associated with chalk and limestone catchments that allow groundwater to rise to the surface through the permeable subsoil following long periods of wet weather. It can also occur in areas where 'made ground' has been deposited above impermeable subsoils, typically during ground raising or levelling works.

An assessment of areas susceptible to groundwater flooding was undertaken as part of our PFRA. The Areas Susceptible to Groundwater Flooding (AStGWf) map has been used in our assessments during the preparation of our Flood Strategy and is shown in Figure 3-5. The AStGWf map shows the area most likely to be susceptible to groundwater flooding is located in the north west of the catchment and in the area around Stanford-le-Hope, with the susceptibility decreasing moving southwards.

The South Essex CFMP describes the impact of commercial chalk quarrying may have had on groundwater levels in Thurrock. During excavation of the chalk, the quarried areas became de-watered. Since chalk quarrying has come to an end, de-watering activities have ceased and groundwater levels have risen again. Continual increases in groundwater levels could lead to local flooding for development located in close proximity to former quarries where restored ground levels are lower than the natural ground levels.

Responsibility for managing groundwater flood risk lies with LLFAs. No incidences of groundwater flooding have been reported to the Council or the Environment Agency.

3.3.5 Reservoir flooding

Flooding from reservoirs is the result of the partial or complete failure of a reservoir structure. It may be caused by erosion due to seepage; overtopping of the dam beyond its design level; or through accidental damage to the structure.

The responsibility for managing the risk is the reservoir owner (referred to as an 'Undertaker'); this may be a private landowner, the Environment Agency, local authority or Water Company.

Reservoirs shown to pose a risk to Thurrock on the Environment Agency's reservoir flood risk maps are Tilbury Flood Storage Reservoir and Sticking Hill Reservoir. The Tilbury Flood Storage Reservoir flood risk map shows the areas predominantly affected in the event of failure of the reservoir structure is Tilbury, the rural land to the north of Tilbury and some isolated properties. The Sticking Hill Reservoir flood risk map shows the area potentially affected in the event of failure of the reservoir structure is predominantly agricultural with a few isolated properties.

3.4 How flood risk may change in the future

Factors that may increase the probability of flooding in the future include

- Climate change and the effects may include
  - Warmer wetter winters
  - Hotter drier summers
  - Fewer days of ice, frost and snow
  - Higher likelihood of extreme weather events e.g. heatwaves, intense rainfall
- Urban creep (infill development and loss of green space)
- Aging infrastructure (deteriorating condition, increased pressure on drainage systems and other infrastructure)
- Population growth (increasing and/or higher density of populations increasing the number of people at risk of flooding)

This Flood Strategy considers how local flood risk may change in the future. The flood risk management measures we have identified must make allowances for climate change so proposed investment delivers longer term benefits.

3.4.1 Thurrock Climate Change Adaptation Strategy (2009)

Thurrock Council drafted a Climate Change Adaption Action Plan in 2009. In 2013 we updated our Environment Vision and Policy, recommitting to develop a climate change strategy under the Local Government Association (LGA) Climate Local Programme.

Climate Local is an initiative launched by the Local Government Association in 2012 and builds on the Nottingham Declaration on Climate Change. It enables local areas to make a national commitment to climate change whilst setting locally relevant targets.

Thurrock Council signed up to the Nottingham Declaration in 2007 and began work to reduce climate change emissions from 2005 levels both within the Council and across the Borough.

Climate change guidance can be found in the following two documents

- UK Climate Projections (UKCP09)
- Adapting to climate change: Advice for Flood and Coastal Erosion Risk Management Authorities (Environment Agency, 2011)

Climate change scenarios for surface water flooding were modelled as part of our SWMP to provide us with an indication on how the risk from surface water flooding may change in the future.

As we move through the Flood Strategy period and the actions in our Programme and Strategic Investment Plan are developed and taken further, we will assess the measures with regards to climate change, to

ensure they are sustainable and that they are consistent with both national and local policies and targets.

3.5 Other sources of flooding

3.5.1 Main Rivers and tidal (sea) flooding

Main Rivers are generally large rivers such as the Mar Dyke and Stanford Brook.

Mar Dyke: the Mar Dyke flows south and then southwest through the Borough to its confluence with the River Thames at Purfleet. The Mar Dyke has been modified as part of a land drainage scheme, including channel widening and raised banks, by the Environment Agency's predecessor, the Essex River Authority, in the late 1970s. The outlet into the Thames Estuary is controlled by the Mar Dyke Sluices, a set of mitre gates that automatically close when the tide exceeds the river level. This is backed up by a vertical sluice. The Mar Dyke drains a large proportion of the west of Thurrock.

Stanford Brook: the Stanford Brook flows southwards through Stanford-le-Hope and Mucking Marshes into the Thames Estuary. The Stanford Brook drains a small catchment in the east of Thurrock. The Victoria Road Brook joins the Stanford Brook in Stanford-le-Hope.

We have not prepared new mapping for flooding from Main Rivers within our Flood Strategy as the latest information is available from the Environment Agency's website.

The majority of the flood risk to urban areas is to those located along the Thames Estuary. However, the presence of flood defences mean the National Flood Risk Assessment (NaFRA) class for the majority of the urban area at risk is low. Areas of higher risk tend to be located in marshland, for example Aveley Marshes and East Tilbury Marshes or in the upper reaches and tributaries of the Mar Dyke, such as the New Mar Dyke and Stringcock Sewer which flow through Bulphan.

Table 3-2 Number of properties at risk – fluvial and tidal flooding

Ward	NaFRA risk classification		
	High	Medium	Low
Aveley and Uplands	0	3	42
Belhus	0	0	0
Chadwell St Mary	0	0	5
Chafford and North Stifford	1	4	1
Corringham and Fobbing	0	0	4
East Tilbury	5	72	968
Grays Riverside	312	234	1,655

Ward	NaFRA risk classification		
	High	Medium	Low
Grays Thurrock	0	0	34
Little Thurrock Blackshots	0	0	0
Little Thurrock Rectory	0	5	139
Ockendon	0	0	0
Orsett	26	12	45
South Chafford	0	0	0
Stanford East and Corringham Town	0	0	0
Stanford-le-Hope West	18	133	232
Stifford Clays	0	0	0
The Homesteads	16	11	440
Tilbury Riverside and Thurrock Park	96	275	2,197
Tilbury St Chads	82	696	1,522
West Thurrock and South Stifford	349	190	776
Total	905	1635	8060

Table 3-3 NaFRA class definitions

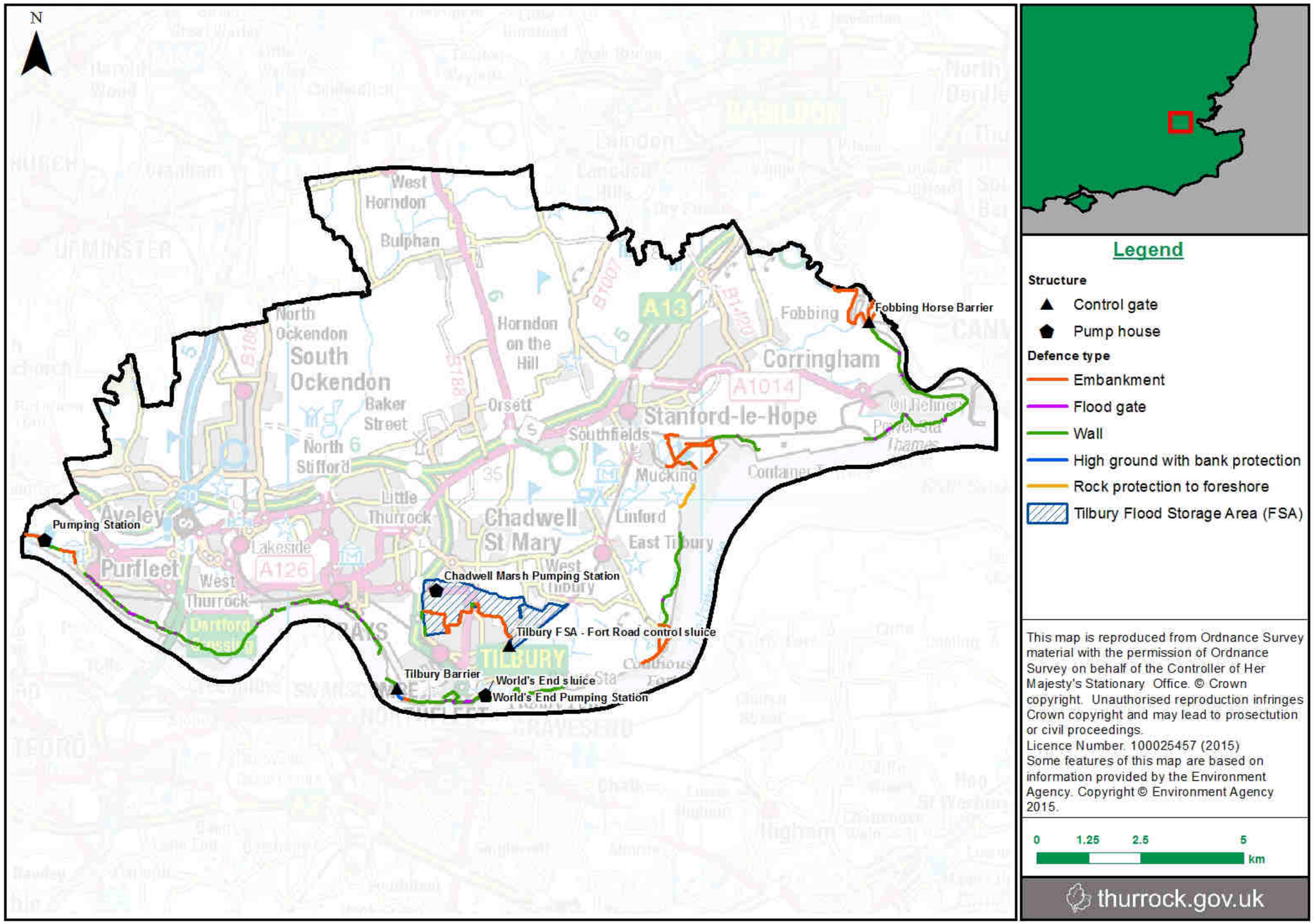
NaFRA Class	Description
Low	These areas have a chance of flooding of between 1 in 1,000 (0.1%) and 1 in 100 (1%).
Medium	These areas have a chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%).
High	These areas have a chance of flooding of greater than 1 in 30 (3.3%).

Flood defences

There are a range of flood defences in Thurrock, both tidal and fluvial. Tidal defences mainly consist of raised reinforced concrete walls, steel walls or earth embankments. Fluvial flood defences includes small watercourse channels that provide protection. The majority of flood defences are Grade 2 or 3 (Grade 1 being the best classification and Grade 5 the worst). Many of the defences that are in very poor condition (Grade 5) are close to Tilbury. Other defences of note are the Tilbury and Fobbing Barriers and Mardyke Sluice, along with the

Tilbury Flood Storage Area. These flood defences are important flood infrastructure reducing the risk of flooding to Thurrock.

Figure 3-6 Flood defences and assets in Thurrock



4 Objectives and Measures

4.1 National Objectives

The National Flood and Coastal Erosion Risk Management Strategy for England (the **National Strategy**) is developed by the Environment Agency who is responsible for its maintenance, application and monitoring in accordance with the requirements of the FWMA 2010. The overall aim of the National Strategy is to ensure the risk of flooding and coastal erosion is properly managed in a coordinated way.

The National Strategy sets out the following national objectives

- **N1: Understanding the risks** of flooding and coastal erosion, working together to put in place long-term plans to manage these risks, and making sure that other plans take account of them (N1)
- **N2: avoiding inappropriate development** in areas of flood and coastal erosion risk, and being careful to manage land elsewhere to avoid increasing risks (N2)
- **N3: reducing risk** by building, maintaining and improving flood and coastal erosion management infrastructure and systems to reduce the likelihood of harm to people and damage to the economy, environment and society (N3)
- **N4: increasing public awareness** of the risk that remains and engaging with people at risk to encourage them to take action to manage the risks that they face and to make their property more resilient (N4)
- **N5: Improved emergency planning and recovery** by improving the detection, forecasting and issue of warnings of flooding, planning for and co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding. (N5)

We have aligned our Flood Strategy and objectives with those outlined by the Environment Agency.

4.2 Our vision and objectives

4.2.1 Our vision (Thurrock Corporate Plan)

The Thurrock Corporate Plan outlines five priorities for Thurrock over 2013-2016. These priorities are:

- create a great place for learning and opportunity;
- encourage and promote job creation and economic prosperity;
- build pride, responsibility and respect;
- improve health and wellbeing; and
- protect and promote our clean and green environment;

These priorities contribute to the following vision for Thurrock:

"Thurrock: A place of opportunity, enterprise and excellence, where individuals, communities and businesses flourish'

4.2.2 Our Flood Strategy objectives

We have set out the following objectives for managing flood risk. These contribute to achieving the priorities set out in the Corporate Plan and are consistent with the objectives and principles of the National Strategy.

OBJECTIVE ONE (L1):

Reduce the likelihood and consequences of flooding, particularly from surface water, groundwater and ordinary watercourses

OBJECTIVE TWO (L2):

Identify any gaps where further studies are required so we can get a better understanding of the causes and effects of local flooding

OBJECTIVE THREE (L3):

Reduce the vulnerability of Thurrock, its residents and visitors to the detrimental effects of flooding

OBJECTIVE FOUR (L4):

Establish clear roles, powers and responsibilities for Thurrock RMAs and ensure RMAs are aware of each other's roles and responsibilities

OBJECTIVE FIVE (L5):

i) Provide improved communication of clear information on local flood risk, appropriate responses and the responsibilities for us and our partners.

ii) State what we and other RMAs cannot take responsibility for, and facilitate engagement of the public and stakeholders to take action

OBJECTIVE SIX (L6):

Improve co-operative working between all RMAs, including across administrative boundaries

OBJECTIVE SEVEN (L7):

Improve natural habitat and the social environment through flood management schemes to provide multiple benefits

OBJECTIVE EIGHT (L8):

Establish a strategic funding plan and programme so we identify priorities, secure funding for measures that are affordable and that wherever possible include provisions for contributions by those who benefit

Table 4-1 shows how our Local objectives align with the National objectives. Many of our Local objectives align with more than one of the National objectives.

Table 4-1 Links between National and Local objectives

National Strategy objectives	Local Strategy Objective							
	L1	L2	L3	L4	L5	L6	L7	L8
N1		✓		✓	✓	✓		
N2	✓		✓	✓				
N3	✓		✓	✓		✓	✓	✓
N4			✓		✓			✓
N5			✓		✓	✓		

The National and Local objectives have been considered during the action planning process; the objectives that each action will work towards meeting have been identified within the Annual Action Plans.

4.3 Measures

A key output from our Flood Strategy is the Programme and Strategic Investment Plan, which covers the full 6 years of the Flood Strategy. Each year the plan is reviewed and an Annual Action Plan prepared to address the identified priorities. The details initially included in our Flood Strategy and Action Plans reflect the resolution of the data available at the time of plan preparation. In the coming years we intend to provide higher resolution information as our understanding and data is improved. The 6 year Flood Strategy and Annual Action Plans set out the actions that we plan on undertaking as we work towards meeting our local objectives.

The measures that have been considered as part of the action planning process can be categorised into the following strategic themes

- Communication & partnerships: actions designed to work with other RMAs and local communities to raise awareness of flood risk management and to develop partnerships to work towards meeting our objectives

- FWMA & Flood Risk Regulations: actions designed to ensure we meet the responsibilities assigned to us, as a LLFA, under the FWMA.
- Investigation, feasibility & design: actions aiming to further our understanding of flooding within the Thurrock area, investigating where flooding may be an issue and the potential solutions to local flooding problems, and implementing solutions once investigation and feasibility has been assessed
- Policy: actions with the aim of developing and strengthening flood risk policy within Thurrock
- Flooding mitigation: actions designed to mitigate against the risk of flooding

In addition to the themes outlined above, many of the options in our Programme and Strategic Investment Plan will also seek to support Water Framework Directive (WFD) objectives. Many of the proposed options are still in their early stages; however, as we develop these options we will seek opportunities to implement River Basin Management Plan measures, as well as focus on achieving wider environmental benefits to develop sustainable flood risk management. Furthermore, during the development of a scheme we will investigate potential for water body improvement or restoration, for example by improving water quality or hydromorphology. We will also ensure that our actions do not result in a deterioration to a water body.

The current Annual Action Plan is provided in Appendix A and the Strategic Investment Plan is provided in Appendix H.

As we progress through the Flood Strategy period the Programme and Strategic Investment Plan and Annual Action Plans will be under review as additional information becomes available. For example, as the feasibility of proposed schemes is investigated, whole life costs and benefits, timeframes for delivery and opportunities for partnership funding will be determined. Additionally, the future sustainability of the schemes will be investigated and the impact of climate change taken into account.

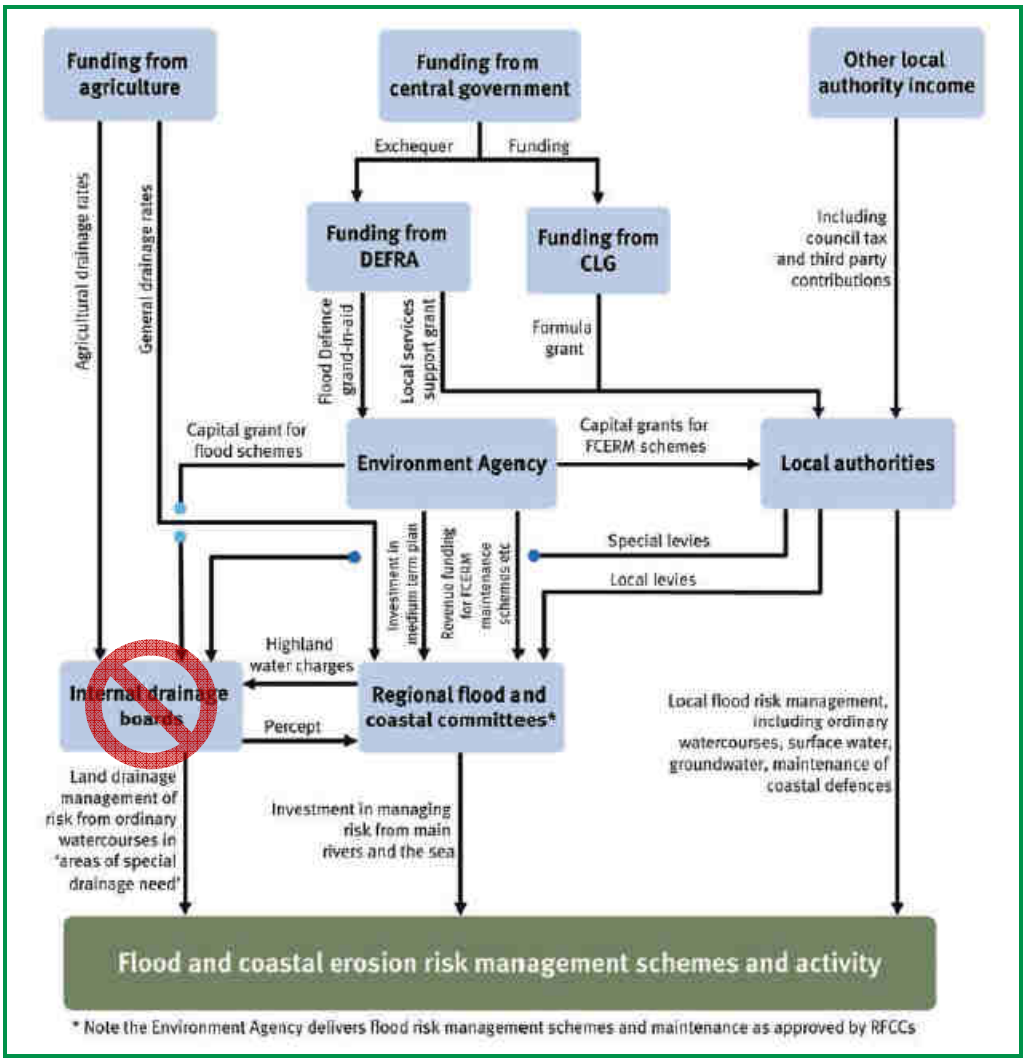
5 Funding

5.1 Funding sources

Figure 5-1 shows the current various sources of funding available to RMAs. These are described in more detail in the following sections. (Note: there are no Internal Drainage Boards within Thurrock, therefore this source of funding is not available and has been crossed out).

At this stage we have only identified possible options for measures. As we continue to investigate the potential for, and feasibility, of the schemes outlined in our Programme and Strategic Investment Plan, we will carry out cost-benefit ratio analysis of the measures, determine whole life costs and identify sources of funding, including opportunities to work with partner RMAs, local industry and business and the public

Figure 5-1 Funding streams for RMAs



Source: Environment Agency National Strategy

A good practice guide has been developed by DEFRA to support LLFAs – ***Partnership funding and collaborative delivery of local flood risk management: a practical resource for LLFAs (March 2012).***

5.1.1 Flood and Coastal Erosion Risk Management Grant in Aid (GiA)

Introduced in 2011, this funding is potentially available to all RMAs to meet the costs, partially or in full, of any scheme with an adjusted Partnership Funding scoring of 100% or greater (a worthwhile scheme). The level of funding that is potentially available for a scheme is based on Outcome Measures (OM) set by Defra for the Flood and Coastal Erosion Risk Management (FCRM) capital programme.

- **OM1 (Economic benefits):** The average benefit cost ratio across the capital programme based upon the present value whole life costs and benefits of projects delivering in the Government spending review period.

  Individual projects will need to estimate and report Present Value Benefits and Present Value Costs.
- **OM2 (Households at flood risk):** the number of households moved out of any flood probability category to a lower category
- **OM2b:** the number of households for which the probability of flooding is reduced from the very significant category to the moderate of low category
- **OM2c:** the number of households in the 20% most deprived areas moved from the very significant or significant flood probability category to the moderate or low category
- **OM3 (Households at erosion risk):** the number of households better protected from coastal erosion
- **OM3b:** the number of households protected against loss from coastal erosion in a 20-year period
- **OM3c:** the number of households in the 20% most deprived areas protected against loss from coastal erosion in a 20-year period
- **OM4a (Water dependent habitat):** the area (in hectares) of water-dependent habitat created or improved to help meet the objectives of the Water Framework Directive, Section 28 of the Wildlife and Countryside Act(1981), and the England Biodiversity Strategy)
- **OM4b (Intertidal habitat):** the area (in hectares) of intertidal habitat created to help meet the objectives of the EU Habitats/Birds Directives, Section 28 of the Wildlife and Countryside Act(1981), and the England Biodiversity Strategy)
- **OM4c (Protected rivers):** the length (in kilometres) of rivers protected under the EU Habitat Directive, EU Birds Directive or

Section 28 of the Wildlife and Countryside Act(1981) improved to meet the objectives of the Water Framework Directive

There are always more schemes proposed in any one year than there is Government funding available. Whilst some schemes may be fully funded, others may only be partly funded by GiA. Any shortfall in the amount of funding will need to be found from elsewhere. Schemes are more likely to receive GiA funding where additional Partnership Funding can be found to support their delivery.

5.1.2 Local Levy

Local Levy funding is available through the Regional Flood and Coastal Committees (RFCCs) and can be used, with the approval of the RFCC, to support flood risk management projects that do not receive full national funding through GiA. Local Levy is raised by RFCCs from within their area of representation. The amount of levy is agreed and approved annually.

5.1.3 Partnerships with other RMAs

By working in partnership with other RMAs schemes can be developed to provide multiple benefits as well as increasing the likelihood of the scheme attracting GiA funding. Potential partners include

- Anglian Water:
- Environment Agency:
- Highways Authority:
- Neighbouring LLFAs:

5.1.4 Council funds

Local authority funding for flooding projects have to compete with a wide range of other Council priorities. Investment that can provide more than one benefit will strengthen the case for funding allocation. By looking, wherever possible, to include or integrate flood risk management projects, or influence the designs to ensure projects or schemes reduce or mitigate flood risk, multiple benefits can be delivered.

5.1.5 Community Infrastructure Level (CIL) and Section 106

Section 106 (S106) of the Town and Country Planning Act allows a local planning authority to enter into an agreement with a developer or landowner in association with granting planning permission. An agreement under S106 is used to address off site and linked issues that are required in order to make a development acceptable.

S106 agreements should be used by local planning authorities to ensure a strong planning policy to ensure any flood risk caused by, or exacerbated by, new development is resolved and funded by the developer.

The Council currently levies a contribution from new development in the borough towards the provision of facilities that can mitigate the

impact of the development or make it locally acceptable. The Council has identified a list of infrastructure improvements across the Borough that could be introduced or funding contributions collected for as highlighted on the Council's **website**.

S106 provides only partial and variable response to capturing funding contributions for infrastructure. As such, the 2008 Planning Act included provision for the Community Infrastructure Levy (CIL).

CIL is levied by local authorities in England and Wales on new developments in their area. The money raised by CIL can be used to support development by funding infrastructure, for example construction of new infrastructure, increase the capacity of existing infrastructure, or repair failing infrastructure. Infrastructure that can be covered by this scheme includes flood defences, transport, schools, hospitals and parks. Flood defences that only affect current development cannot be included in this scheme.

The Council is currently developing its CIL strategy and it is expected that it will supersede the infrastructure requirements identified in the S106 list when it is adopted. This is expected to happen in 2017.

5.1.6 Defra grants

Defra grants are allocated directly to support the introduction of new legislation and practices, or are made available for local authorities to submit grant applications for funding for specific Government schemes.

5.1.7 Private / local funding

Contributions from local communities and business that would benefit from measures delivered through the Local Strategy could increase the likelihood of schemes attracting GiA funding in line with the existing Partnership Funding policy.

5.1.8 Other sources

- European funding – European Regional Development Fund (ERDF)
- The Growing Places Fund
- Green Investment Bank
- The Catchment Restoration Fund
- Business Rate Retention
- Big Lottery Fund (Communities Living Sustainably)
- Heritage Lottery Fund
- Network Rail
- HS1 (Channel Tunnel Rail Link)
- Highways England (Lower Thames Crossing)

6 Delivery

The Actions identified in the Programme and Strategic Investment Plan (Appendix H) have been used to prepare the annual Action Plan, and will also be the basis for future annual Action Plans throughout the Flood Strategy period. The Actions have been prioritised based on the availability of funding, how they contribute to the aims and objectives set out in the Flood Strategy and on the number of additional benefits that they may provide. The prioritisation seeks to capture benefits that can be obtained from committed investment on schemes that potentially deliver multiple outcomes and is not just based on the severity of risk. In this way it is possible to bring forward measures that might otherwise take much longer to deliver.

Areas that have an historical record of flooding have also been prioritised.

The ability to deliver our Action Plan is dependent on the availability of funding. Funding availability is anticipated to change over time and consequently our prioritisation may change to reflect the variability in funding opportunities, as well as any significant flooding events, changes in development pressures and plans, or shifts in local priorities.

Many of our actions are still at the investigation stage, looking at potential options for flood risk management. As we move through the Flood Strategy period, these actions will be developed and assessed in more detail. It is at that stage that we will establish when the measures will be implemented, the costs and benefits of the measures and the timeframe for delivery. To seek to improve the resolution of the information in our Programme and Strategic Investment Plan we will initially review these annually and adjust our Annual Action Plans accordingly.

6.1 Borough-wide actions

Borough-wide actions have been identified with the aim of following the objectives of the Flood Strategy outlined in section 4 as well as the Environment Agency's national objectives. Full details of borough wide actions in the Action Plan are provided in Appendix A

6.1.1 Improving understanding of flood risk

Recording and investigating flood incidents

One of Thurrock Council's responsibilities under the FWMA is to investigate flooding incidents and publish details of the investigation. The aim of flood investigation reports is to collate all useful information relating to the flood together in one place, to provide an understanding of why the situation is the way it is, as well as outline possible causes of flooding and potential solutions.

The investigation report identifies the RMAs that have relevant roles and responsibilities and whether those responsibilities were exercised adequately in the response to the flood.

Although it is not possible to investigate all instances of flooding across the borough, Thurrock Borough Council will undertake a formal investigation if:

- There has been internal flooding of a property on more than one occasion
- There has been internal flooding of five or more properties during a single incident
- The source or responsibility of a flooding incident in uncertain

Note: internal flooding means water entering a habitable building. It does not include the flooding of gardens and garages

Flood investigations are reported on Thurrock Council's **website**.

Quebec Road, Tilbury – Flood Investigation

In November 2013 Thurrock Council published a Section 19 Flood Investigation report into the repeated flooding of properties and roads in and around Quebec Road in Tilbury. The investigation involved a number of partners including Anglian Water, the Environment Agency, Port of Tilbury and Thurrock Council in its capacity as Lead Local Flood and Highways Authority.

The investigation determined that the flooding was being caused by surcharging of sewers on Quebec Road resulting from difficulties with the sewer system discharging to the Main River.

A number of actions were identified to mitigate the flood risk and reduce the frequency and impact of future floods. The Environment Agency undertook extensive vegetation and silt clearance to improve flow and capacity in the Main River resulting in improved discharge from the sewer. This was further improved by culvert clearing works by Thurrock Council and a sewer cleanse in and around Ottawa Road.

Further work is ongoing to establish an Integrated Flood Strategy for Tilbury to identify future priorities for flood risk management.

Surface Water Management Plan

The Thurrock Surface Water Management Plan (**SWMP**) was published in July 2014 to increase knowledge of local flood risk and to support the establishment of feasible measures to mitigate surface water flooding where possible.

Implement a standardised asset register

As an LLFA, Thurrock must establish and maintain a register of assets (physical structures or features e.g. culverts, weirs, and pumps) that, in our opinion, are likely to have an impact on flood risk in Thurrock. We must record information such as ownership and condition about each asset. We are continuing to develop our asset register.

The asset register will also assist us in identifying the ownership and, responsibilities of ordinary watercourses and assets across Thurrock and review maintenance to ensure it is carried out regularly to reduce the likelihood of any adverse impact on flooding.

6.1.2 Regulating works on ordinary watercourses

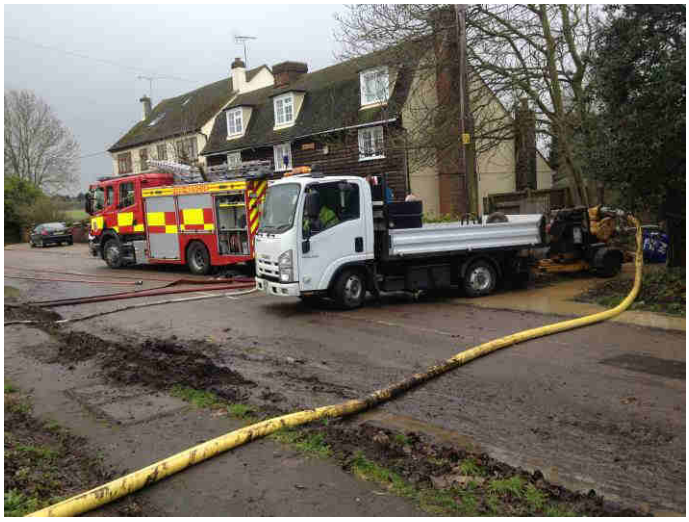
On the 6 April 2012, the powers of ordinary watercourse consent and enforcement were transferred from the Environment Agency to LLFAs. The purpose of ordinary watercourse regulation is to control activities that may have an adverse impact on flooding. Regulation of works includes consenting of works before they are constructed and enforcement actions to remediate or remove unconsented structures or obstructions.

Further information on the consenting process and enforcement is provided in Appendix F.

6.1.3 Improve co-operative working between all RMAs

Thurrock Borough Council is continuing to work with all RMAs through the Thurrock Flood Partnership as well as through sharing of information and collaborative working.

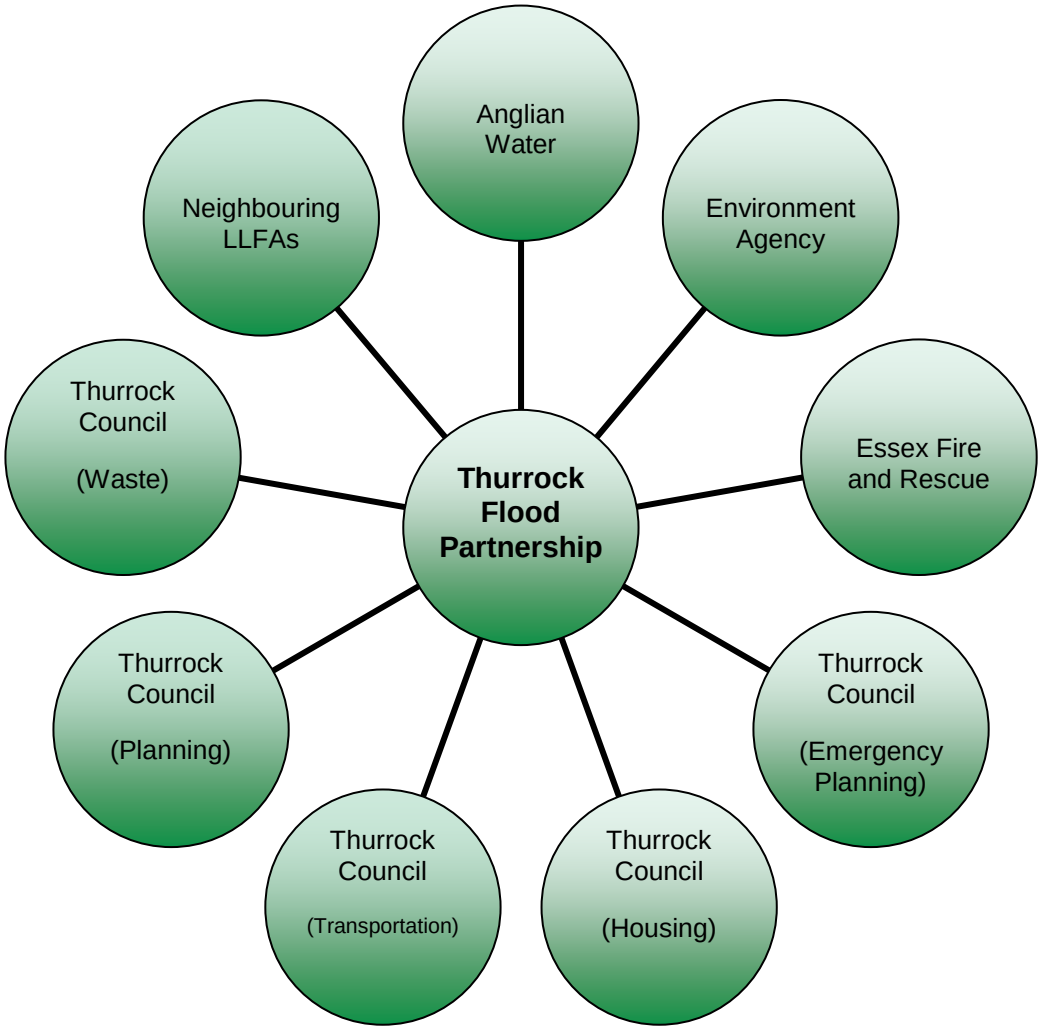
Pump Street, Horndon on the Hill – Flood Alleviation



Flooding of properties on a number of occasions in 2013 and 2014 resulted in a call from the local community for help in identifying solutions to the problem. Through the Council's investigations, it was found that the flooding was primarily being caused by an undersized culvert and lack of maintenance to the watercourse downstream of the properties, preventing water from flowing away.

Working with local landowners, extensive vegetation clearance was undertaken to the watercourse in January 2014 and computer modelling was undertaken to determine potential flood alleviation options. These investigations culminated in a bid to the Environment Agency to replace the existing culvert with a twin 600mm culvert and a flood wall around the properties to provide added protection. The works are due for completion in 2016.

The Thurrock Flood Risk Partnership meets twice a year, providing the means to coordinate flood risk management amongst RMAs. This gives RMAs within Thurrock, as well as neighbouring LLFA's, an opportunity to discuss flood risk issues and discuss potential solutions. It will encourage partnership working between RMAs as well as ensuring a consistent approach to sustainable flood risk management which is consistent with policies in other plans and strategies for Thurrock, such as the Thames RBMP, CFMP and FRMP and the South Essex CFMP. The Thurrock Flood Risk Partnership devised and agreed the local objectives set out in Section 4.2.2 and will have responsibility for review of the Local Strategy and monitoring its progress.



6.1.4 Spatial planning / land use policy

Local planning decisions need to consider flood risk, particularly from surface water, ordinary watercourse and groundwater during the planning process. This is to ensure that inappropriate development is avoided in areas where there is significant local flood risk.

Sustainable drainage systems (SuDS)

On 18 December 2014 a Written Ministerial Statement laid by the Secretary of State for Communities and Local Government set out changes to the planning process that would apply for major development from 6 April 2015. In considering planning applications, local planning authorities should consult the LLFA on the management of surface water, satisfy themselves that the proposed minimum standards of operation are appropriate and ensure, through use of planning conditions or obligations, that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

In March 2015 the LLFA was made a statutory consultee which came into effect on 15 April 2015.

As a result, Thurrock Council in its capacity as LLFA, is to provide technical advice to planners on surface water drainage strategies and designs put forward for new major developments.

Major developments are defined as

- Residential development: 10 dwellings or more, or residential development with a site area of 0.5 hectares or more where the number of dwellings is not yet known
- Non-residential development: provision of a building or buildings where the total floor space to be created is 1,000 square metres or more or, where the floor area is not yet known, a site area of 1 hectare or more.

Thurrock Council has produced a draft SuDS policy (see Appendix G) to be used by developers, consultants and designers to support them in their understanding of Thurrock Borough Council's SuDS design requirements.

Runoff rates for new major developments in AoCD

For all new developments the peak runoff rate for the 1 in 1 year and 1 in 200 year runoff must not exceed the peak greenfield runoff rate for the same event. The runoff volume for the development site in the 1 in 200, 6 hour rainfall event must not exceed the greenfield runoff volume for the same event.

Runoff rates for previously developed sites in AoCD

For previously developed sites the peak runoff rate (1 in 1 and 1 in 100 year) and volumes (1 in 100 year, 6 hour rainfall event) must not exceed the equivalent greenfield rates.

6.1.5 Community awareness and engagement

During the development of our LFRMS we conducted an online questionnaire to get an appreciation of the level of awareness of flood risk within Thurrock. Of the 12 respondents, 90% of respondents had been affected by flooding in some form and only 10% of respondents knew that Thurrock Council was a Lead Local Flood Authority. Over 80% of respondents to the questionnaire would like more information and advice on which organisation to contact during flooding, and over 65% would like more information and advice on flood warning services and how to access them, and on how households can prepare for flooding.

The results of the questionnaire highlight the need to communicate effectively and engage with local communities and members of the public to set realistic and achievable expectations and outcomes for local flood risk management.

A number of measures have been identified in our Programme and Strategic Investment Plan so we work towards improving communication and involvement, including:

- Increasing awareness within communities at risk through newsletters, website, drop-in surgeries etc.
- Highlighting to communities the impact of flytipping on flood risk
- Target communication with riparian landowners and communities to inform them of their responsibilities under the Land Drainage Act (1991) and the importance of good drainage practice and drainage maintenance.

In addition to the measure identified above, we will be consulting with and involving communities with potential responses to flood risk as scheme options in our Action Plan are identified and are being developed.

We have developed a Communications and Engagement Plan (CEP) for use in the delivery of the Flood Strategy so that the community can be appropriately involved during all stages of the planning and implementation process. We will review the CEP during the course of the Local Strategy period so that we engage and communicate appropriately with the local community.

6.2 Area of Critical Drainage (AoCD) specific actions

AoCD specific actions have been identified to achieve the Flood Strategy and national objectives on a local scale in identified locally important flood risk areas. Details of AoCD specific actions in the Action Plan are provided in Appendix A.

AoCD specific actions may include

- Working with RMAs to improve drainage capacity and infrastructure in areas currently shown to be at risk of flooding

- Implementing preferential maintenance regimes to ensure flow enters drainage channels rather than ponding on the surface
- Investigation of potential for storage areas to alleviate the risk of flooding in known risk areas
- Confirmation of ownership and maintenance of specific assets known to be important in flood risk management
- Encouraging implementation of flood resilience measures and property protection schemes for areas known to be at risk of flooding

6.3 Wider environmental benefits

6.3.1 Protected areas

Thurrock supports internationally designated nature conservation sites; there is one Ramsar and SPA site within the Borough and three Ramsar sites and SPAs within 15km of Thurrock's boundary. The borough does not support any SACs but there are three within 15km. The sites within the borough are summarised below:

- Thames Estuary and Marshes SPA
- Thames Estuary and Marshes Ramsar

The sites within 15km of the borough are the following

- Benfleet and Southend Marshes SPA
- Benfleet and Southend Marshes Ramsar
- Medway Estuary and Marshes SPA
- Medway Estuary and Marshes Ramsar
- North Down Woodlands SAC
- Crouch and Roach Estuaries SPA
- Crouch and Roach Estuaries Ramsar
- Essex Estuaries SAC
- Peter's Pit SAC

6.3.2 Water Framework Directive (WFD)

A key objective of the WFD is the requirement to prevent deterioration in the current status of water bodies, whilst Heavily Modified Water Bodies (HMWBs) must achieve good ecological potential within a set deadline. If an activity has the potential to impact on the ecology or morphology of a water body, the risk of causing deterioration in the status must be assessed.

Thurrock is covered by the Thames River Basin Management Plan (RBMP), which identifies the current quality of water bodies in the borough and sets objectives for making further improvements to the ecological and chemical quality.

The Mar Dyke is generally not designated as a HMWB and has an overall status of moderate under the WFD. However, the Mar Dyke (West Tributary) and Mar Dyke (East Tributary) have a poor overall status and poor ecological status, although it is not designated as a HMWB. The Mar Dyke and Fobbing water body is designated as a HMWB and has moderate ecological potential under the WFD.

The section of Thames south of Thurrock extending east to Stanford-le-Hope is classed as the 'Thames Middle' water body, and is designated as a HMWB, with a current overall potential of moderate. The Thames Lower water body runs east from Stanford-le-Hope and is also designated as a HWMB, with an ecological and overall status of moderate.

6.3.3 How we have taken account of protected areas and WFD in the preparation of this Flood Strategy

A Strategic Environmental Assessment (SEA) and a Habitat Regulations Assessment (HRA) have been undertaken alongside the development of the Flood Strategy to ensure environmental consequences are considered during its preparation. Further information on the SEA and HRA are provided in Section 8 and Appendix D.

Actions identified in the Flood Strategy have the potential to balance social, economic and environmental aims and objectives to achieve wider environment benefits.

The implementation of sustainable flood risk management options and measures provides a good opportunity to improve the environment across Thurrock. The Flood Strategy will contribute to the achievement of wider environmental objectives through the following actions:

- As flood risk management projects, schemes and initiatives identified within our Programme and Strategic Investment Plan are developed, we will ensure compliance with wider environmental objectives and targets (e.g. those set out by WFD and the RBMP) by ensuring water bodies and protected areas are suitably protected and that the implementation of any scheme does not cause any deterioration of waterbodies. This will be through use of site-specific environmental assessments. In addition the impacts, both positive and negative, of any actions on the internationally designated conservation sites identified above will be assessed at an early stage to ensure there are no detrimental impacts on the sites. We will also consider the impacts on local designated sites, the historic environment and air quality.
- Enhancement of biodiversity and habitat creation within any future capital schemes. Our Programme and Strategic Investment Plan contains a number of potential options for flood storage areas that we will investigate over the Local Strategy period. As these options are developed further, the

opportunities to enhance biodiversity and habitat creation will be explored and implemented.

- Improvement of water quality through use of source control measures such as SuDS. The Thames RBMP sets out a potential action for local and regional government for the promotion of the use of SuDS. Appendix G sets out our SuDS guidance for Thurrock. Source control measures can help with improve water quality through reducing runoff and, therefore, reducing diffuse pollution entering watercourses and drainage systems, helping to meet WFD targets for water quality within Thurrock.
- Working with key partners to ensure sustainable land use planning and safeguarding green open spaces to help reduce flood risk. This also ensures protection for habitats as well as providing a flood risk management function. Our Flood Strategy includes actions to work with development control and planners to seek opportunities from new and redevelopment. This is in line with the action set out in the Thames RBMP for local and regional government to ensure planning policies and spatial planning documents take into account wider environmental objectives. For example spatial planners can ensure proposed development does not lead to any deterioration of water bodies and that sustainability appraisals and SEAs provide due consideration of the potential impact of the development on water bodies and the wider environment.
- Safeguarding ordinary watercourses from inappropriate works. Appendix F sets out Thurrock's ordinary watercourse enforcement protocol. Proposals for alterations to an ordinary watercourse will be closely scrutinised to ensure there is no environmental deterioration of the watercourse, and the proposal is consistent with wider environmental aims and objectives, before consent will be granted.

The relevant RBMP actions have been identified, where possible, for each option identified in our Programme and Strategic Investment Plan.

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7 Reviewing the Local Strategy

Our Local Strategy is a dynamic strategy that we, and other RMAs, will use to support the management of local flood risk now and into the future. The following sections outline how we intend to monitor and update the Local Strategy:

Figure 7-1 Local Strategy Review Process

7.1 Review

The Local Strategy has been developed to provide a short to medium term (six year) plan. We will formally review the main Flood Strategy document in 2021, and update it where necessary, and thereafter every six years. The responsibility for reviewing the Flood Strategy will sit with the Thurrock Flood Partnership.

However, we also recognise that it is difficult to plan for, or commit to, actions that extend into the future; therefore we may need to be reactive and update sections of the Flood Strategy more frequently. Possible triggers that may prompt a more frequent review include

- A significant flood event
- Significant changes to available datasets or understanding or nature of flood risk in Thurrock
- Changes to legislation or policy that may affect roles and responsibilities
- Changes to funding availability

We will review and update the Action Plan annually. This will ensure the Action Plan reflects the variability in Council and external budgets and funding opportunities, any significant flooding events, changes in development pressures and plans, or shifts in local priorities.

7.2 Annual monitoring

We propose to monitor the Flood Strategy annually by reviewing the Action Plan to assess which actions have been delivered and how we are meeting the national and local objectives set out in our Flood Strategy. We will also review whether there has been any change in the prioritisation of actions. The responsibility for reviewing the Programme and Strategic Investment Plan and Annual Action Plans will sit with the Thurrock Flood Partnership.

As the actions identified in our Programme and Strategic Investment Plan are assessed and developed further the plans will be updated, and the program for delivery will be established and included in the annual updates. This will allow us to monitor the progression of the action through delivery and implementation. At the end of each year we will be able to review these actions against their programme of delivery to check progress. Where no timeframe for delivery of an action is available, due to the action not being at a stage to develop a timeframe, we will assess what stage the action is at and what still needs to be done in order to determine when it may be possible to provide a delivery programme.

8 Environmental Assessment

8.1 Background

The FWMA requires the Flood Strategy to demonstrate how it contributes to the achievement of wider environmental objectives.

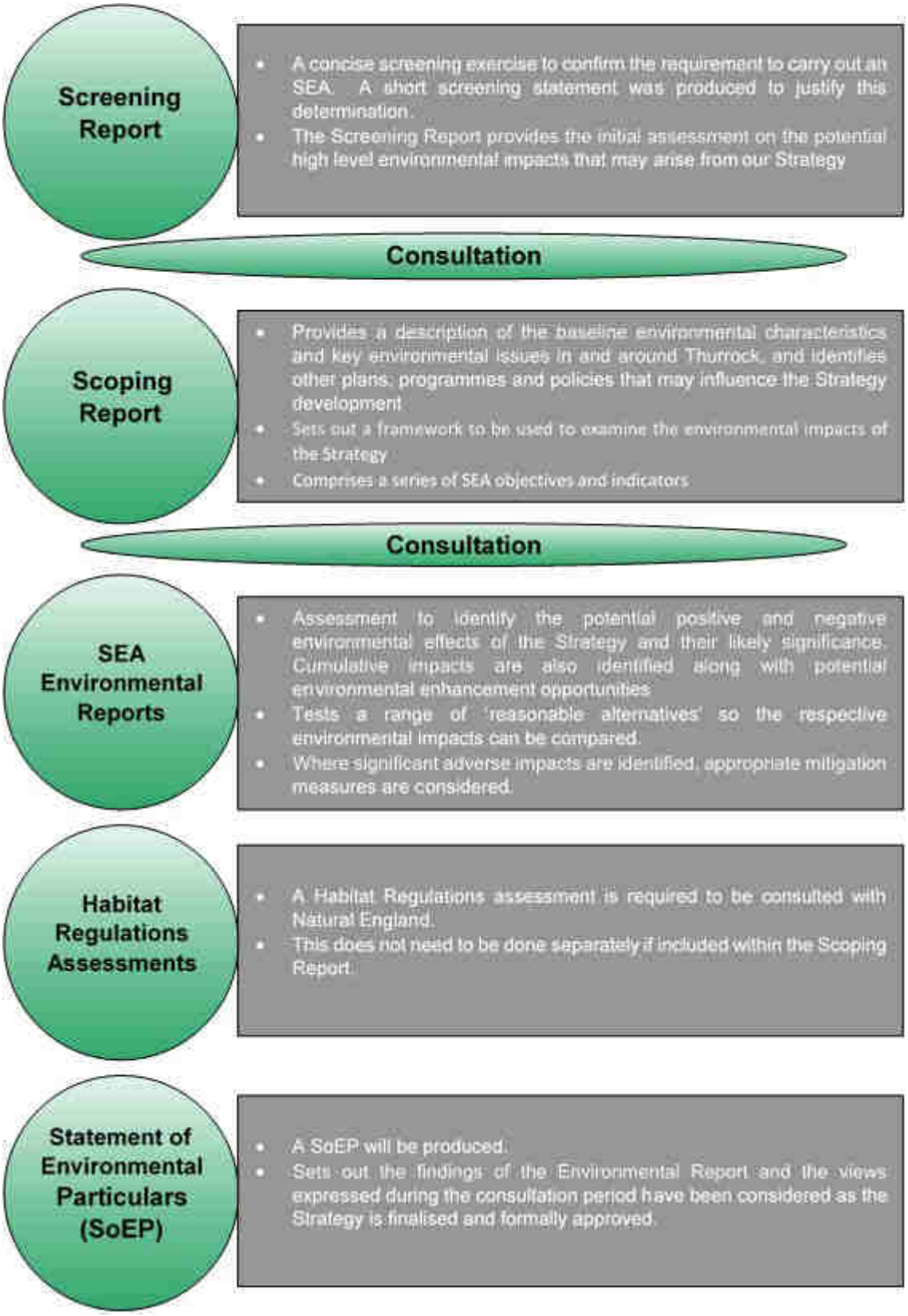
To fulfil our legislative requirements a Strategic Environmental Assessment was required to assess how our Flood Strategy might impact or contribute to the achievement of wider environmental objectives (SEA Directive) alongside consideration of the Conservation of Habitats and Species Regulations 2010 (HRA) and Water Framework Directive (WFD).

The SEA aims to identify potentially significant environmental effects that are likely to be created as a result of the implementation of a plan or programme on issues including the following

- Biodiversity
- Population
- Human health
- Fauna
- Flora
- Soil
- Water
- Air
- Climate
- Material assets (including architectural and archaeological heritage)
- Landscape

The process we have followed in the SEA is set out in Figure 8-1.

Figure 8-1 Environmental Assessment Process



8.2 SEA Screening

The consultation on the SEA Screening Report was undertaken during December 2014 / January 2015. The Screening Report can be found in Appendix D.1.

The Screening Report concluded that a Strategic Environmental Assessment (SEA) would be required for the LFRMS.

8.3 SEA Scoping

We consulted with the statutory consultees on the SEA Scoping Report for a five week period during March / April 2015. The Scoping Report was submitted to the designated consultation bodies for consultation – Natural England, Historic England and the Environment Agency. The Scoping Report can be found in Appendix D.2.

All three statutory consultees provided a consultation response, these can be found in Appendix D.3.

At the end of the scoping period, an Environmental Assessment Report was produced.

8.4 Environmental Assessment Report

The SEA framework is used to identify and evaluate the potential environmental issues associated with the implementation of the LFRMS. The framework comprises a set of SEA objectives that have been developed to reflect the key environmental issues identified through the baseline information review. These objectives are supported by a series of indicators, which are used as a means to measure the potential significance of the environmental issues and can also be used to monitor implementation of the LFRMS objectives. The LFRMS objectives were tested against the SEA assessment framework to identify whether each option will support or inhibit achievement of each objective.

The full Environmental Assessment Report is provided in Appendix **Error! Reference source not found.**.

Table 8-1 SEA objectives and indicators

Receptor	Objective		Indicator
Landscape	1	Protect the integrity of the Borough's urban and rural landscapes, and promote the key characteristics of the SLAs and Green Belt.	Changes in the condition and extent of existing characteristic elements of the landscape. The condition and quality of new characteristics introduced to the environment. Percentage of open countryside.
Biodiversity, flora and fauna	2	Protect and enhance designated and BAP habitats and species in the borough.	Area of designated sites adversely affected by flooding. Monitoring of reported status of designated nature conservation sites. Percentage of land designated as nature conservation sites as a result of LFRMS measures. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat).
	3	Maintain and enhance habitat connectivity and wildlife corridors within the borough.	
	4	Maintain existing, and where possible create new, riverine and estuarine habitat to benefit migratory and	

Receptor	Objective		Indicator
		aquatic species and fisheries, and maintain upstream access.	Number of barriers to fish migration removed.
Water environment	5	Improve the quality and quantity of the water and morphology in the borough's rivers.	Water quality and morphology of the borough's watercourses. Number of pollution incidents. Number of SuDS (Sustainable Drainage Systems) schemes installed as part of the LFRMS. Number and volume of Environment Agency licensed abstractions. Numbers of sites with high pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding.
	6	Do not inhibit achievement of the WFD objectives and contribute to their achievement where possible.	Achievement of WFD objectives. Percentage of water bodies achieving 'Good' ecological status/potential. No deterioration in WFD status.
Soils and geology	7	Reduce the risk of soil erosion and pollution.	Area of agricultural, rural and greenfield land affected by flooding or LFRMS measures. Numbers of sites with high pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding.
Archaeology and Cultural Heritage	8	Conserve and enhance the historic environment, heritage assets and their settings.	Number of heritage assets at risk from flooding, and assessment of impact. Number of vulnerable heritage assets protected from flooding by implementation of the LFRMS. Proportion of conservation area ground at risk of flooding. Number of designated and non-designated heritage assets harmed by FRM measures, including impacts on their settings.
Population	9	Increasing the resilience of people, property and businesses and critical infrastructure within Thurrock to the risk of flooding.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding.
	10	Increase the use of SuDS, particularly in all new developments.	Number of SuDS schemes installed as part of the LFRMS.
Material assets	11	Minimise the impacts of flooding to the borough's transport network and key critical infrastructure.	Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding.
Climate	12	Reduce vulnerability to climate change impacts and promote measures to enable adaptation to climate change impacts.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.

8.4.1 Appraisal of Flood Strategy Objectives

Assessment of the Flood Strategy objectives against the SEA objectives has been undertaken.

No negative environmental effects have been identified from the Flood Strategy objectives. Many of the proposed objectives have the potential for both direct and indirect environmental benefits.

8.4.2 Appraisal of Local Strategy Actions

Assessment of the Flood Strategy actions against the SEA objectives was undertaken.

Some negative and positive environmental effects have been identified, with the majority having a neutral effect. The negative effect identified is minor, and arises from the action that requires drainage infrastructure improvements along rural roads.

8.5 Habitat Regulations Assessment

The European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC, 'the Habitats Directive') as implemented through the Conservation of Habitats and Species Regulation 2010 (as amended) ('the Habitats Regulations') requires a competent authority to carry out a Habitats Regulations Assessment (HRA) of a plan or project to establish whether it will have a 'likely significant effect' on sites designated for their nature conservation interest at an international level (known as European sites, which include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and by UK Government policy, Ramsar sites). The LFRMS for Thurrock Borough, as a statutory plan, is subject to the requirements of the Habitats Directive.

Assessing the impacts of a plan under the Habitats Regulations is a separate process to SEA. However, there is overlap between these two types of assessment. A Test of Likely Significant Effect (TLSE) (Screening Assessment) was undertaken in accordance with the requirements of the Habitats Regulations to determine whether the LFRMS is likely to adversely affect the integrity of a European site (alone or in combination with other plans, policies and projects). Consultation on the outcome of the screening assessment was undertaken as part of the SEA scoping consultation process.

All European sites lying partially or wholly within 15km of the borough boundary were included in the assessment in order to address the fact that measures in the Thurrock LFRMS may affect European sites which are located outside the administrative boundary of the strategy.

Thurrock does support one SPA and Ramsar site; the Thames Estuary and Marshes. There are also six more European sites within 15km of the borough boundary:

- Benfleet and Southend Marshes SPA and Ramsar
- Medway Estuary and Marshes SPA and Ramsar
- Crouch and Roach Estuaries SPA and Ramsar
- North Downs Woodlands SAC
- Peters Pit SAC
- Essex Estuaries SAC

The screening assessment concluded that the LFRMS is not likely to have a significant effect on any of the European sites.

Consultation with Natural England on the outcomes of the screening assessment was undertaken as part of the SEA scoping consultation exercise. Natural England confirmed that the LFRMS is not likely to have a significant effect on the European sites.

Following development of the draft strategy objectives and measures, the screening assessment was reviewed to determine whether the LFRMS would be likely to have a significant effect on the European sites.

8.6 Post Adoption Statement

A Post Adoption Statement has been prepared following consultation on the draft Flood Strategy and SEA Environmental Report with statutory consultees, stakeholders and the public.

The Statement sets out how the findings of the Environmental Report and the views expressed during the consultation period have been taken into account as the LFRMS has been finalised and formally approved. It also sets out any additional monitoring requirements needed to track the significant environmental effects of the Flood Strategy.

The Post Adoption Statement can be found in Appendix **Error! Reference source not found.**.

Appendices

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A Action Plan

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B Areas of Critical Drainage

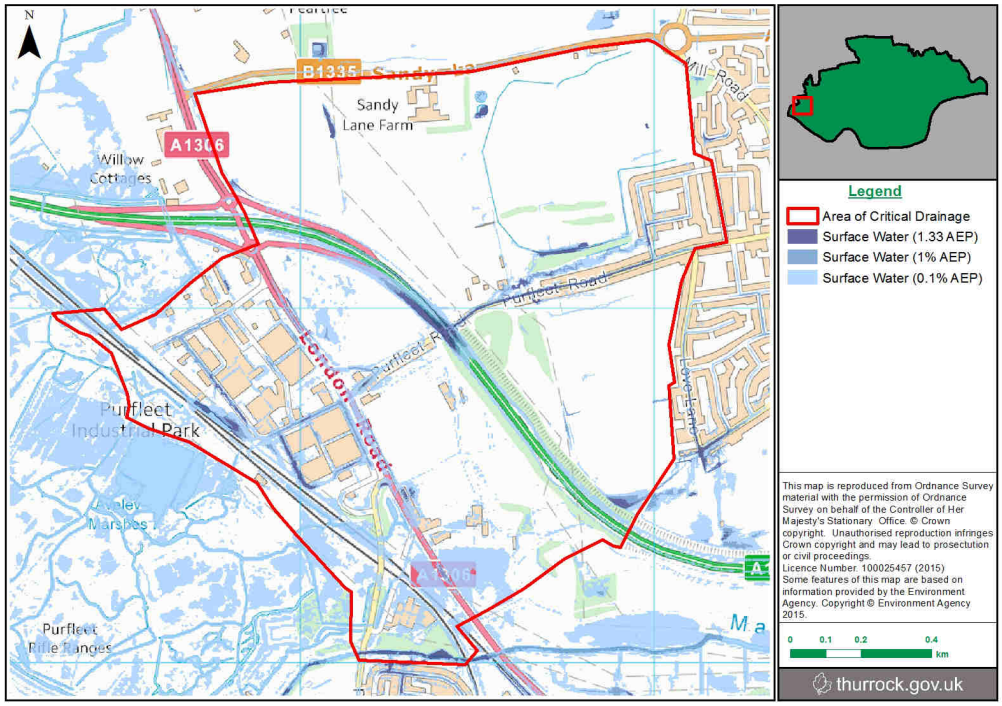
Surface water property counts are based on results from the updated SWMP modelling. As the updated SWMP modelling did not cover the entire Thurrock area, the uFMfSW was used for property counts in the areas not covered by the SWMP results. Properties were counted based on the following criteria, in line with the property count methodology used with the uFMfSW.

- Flood depths are greater than 150mm and 50% or greater of the wetted perimeter of the property was flooded; or
- Flood depths are greater than 300mm and 25% or greater of the wetted perimeter of the property was flooded.

The updated SWMP modelling was not undertaken for the 1 in 1,000 year; therefore the results from the uFMfSW were used for this probability event.

B.1 Purfleet (AoCD01)

Purfleet (AoCD001)



Description:

Located in the west of the Borough, this AoCD largely comprises industrial uses related to port activity. There are also some residential areas to the west, adjacent to the Rainham Marshes. Three local flood risk zones have been identified: the A13, Purfleet Industrial Park and Mileham's Trading Estate.

A13: the highway at this location is maintained by Highways England with Anglian Water providing a discharge point for surface water drainage. Pumps are used to connect a rising main which discharges to the private network at Purfleet Industrial Park and on to Aveley Marshes.

Purfleet Industrial Park & Mileham's Trading Estate: surface water outfalls to drainage ditches at the toe of the rail embankment near Purfleet Industrial Park then passes via a series of 300mm and 225mm diameter pipes into the Aveley Marshes. Flood risk is believed to be due to a combination of factors including rising water levels in the receiving watercourses, local alteration of ground levels leading to failure of local gravity drainage systems and obstructions caused by local infrastructure such as the rail line.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	3	32	14	14	17	0	0
IMD split (H:M:L)	0:0:0	0:0:3	0:0:32	0:0:14	0:0:14	0:0:17	0:0:0	0:0:0
Non-residential Properties								
Total	10	31	146	14	14	22	0	38
IMD split (H:M:L)	0:010	0:0:31	0:0:136	0:0:14	0:0:14	0:0:22	0:0:0	0:0:38
Critical Infrastructure								
Total	0	2	9	0	0	0	0	0

Thames CFMP Policy sub unit	9	**Thames CFMP Policy**	4

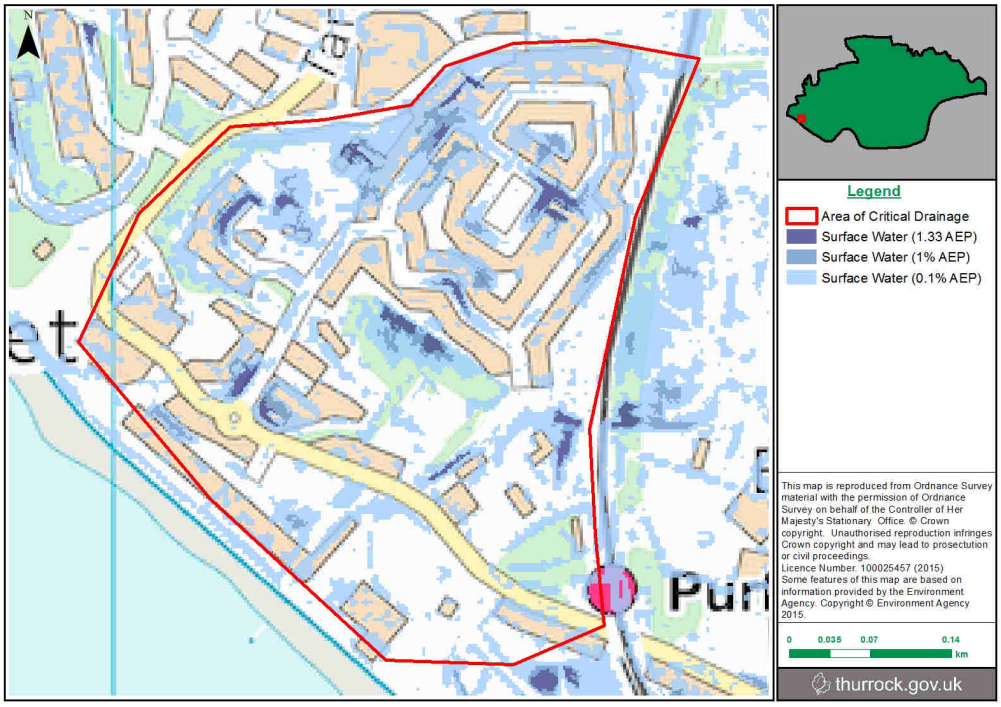
Purfleet (AoCD001)			
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	5	**TE2100 Policy**	4
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M4 – Preparedness & M2 - Prevention
Thames RBMP Catchment	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Highways England/Anglian Water to carry out a check on the pumps and network at this location to confirm their condition. This should be reported back to Thurrock Council. The maintenance regime at this location should be confirmed to Thurrock Council who as LLFA can then chase up with stakeholders if maintenance is not completed.
- Highways England should also liaise with Thurrock Council to confirm emergency diversion procedures, e.g. signage, resources etc
- Network Rail should carry out a survey of the series of 300mm and 225mm diameter culvert crossings at this location within the next 6 months including a maintenance regime.
- Liaise with Aveley Marshes RSPB to discuss water levels within the Marshes. Have these been raised, and if so to what extent? RSPB to show that works undertaken are not having a negative effect on local flood risk.
- Commission a simple drainage study and survey of ground levels to confirm where there are alterations in ground levels which may be causing the local gravity system to fail, assuming the culvert crossings of the rail embankment are sufficient for expected volumes of surface water and the condition of the existing drainage network is satisfactory. The results of this survey will be used to inform a way forward, be it maintenance of the existing system, or installation of a new drainage network at this location.
- Planning policy measures should be used to ensure that any development at the Ponds Farm Development provides betterment on the drainage provision which exists. Any future applications should be consulted with Thurrock highways team and details of on-going funding of maintenance should be provided by the developer to Thurrock Council.

B.2 West Purfleet (AoCD002)

West Purfleet (AoCD002)



Description:

Located in the west of the Borough, this AoCD covers the residential area of Purfleet on the western extent of London Road. Surface water drainage is provided by Anglian Water via a pumped drainage system.

Although the Council has no recorded incidents of surface water flooding at this location, pluvial modelling has identified the area as being at risk of surface water flooding at the toe of the quarry sides along Tank Lane.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	16	34	34	71	0	0
IMD split (H:M:L)	0:0:0	0:0:0	16:0:0	33:1:0	33:1:0	69:2:0	0:0:0	0:0:0
Non-residential Properties								
Total	0	0	0	7	8	11	0	0
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	7:0:0	8:0:0	11:0:0	0:0:0	0:0:0
Critical Infrastructure								
Total	0	0	1	0	0	0	0	0

Thames CFMP Policy sub unit	9	**Thames CFMP Policy**	4
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	5	**TE2100 Policy**	4
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M4 – Preparedness & M2 - Prevention
Thames RBMP	South Essex	**RBMB Identified**	No key actions

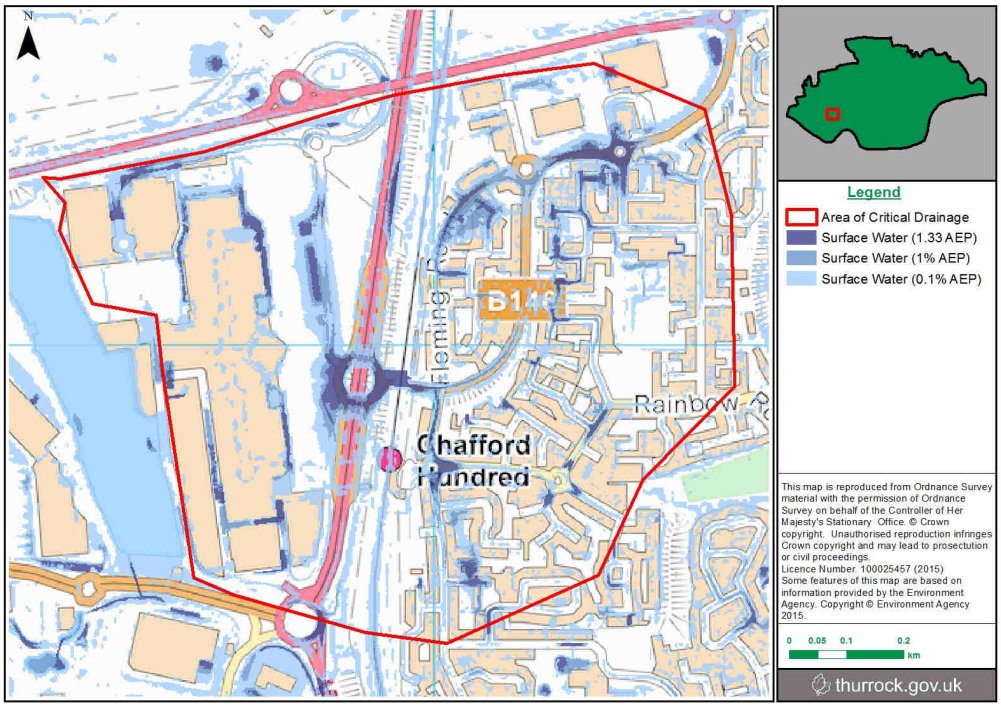
West Purfleet (AoCD002)			
Catchment	Catchment	**Actions**	identified

AoCD Specific Actions:

- Anglian Water to confirm the sizing of the surface water drainage network, including pumps, to inform the need for any increases required to the drainage capacity.
- Anglian Water to confirm their maintenance regime within this AoCD

B.3 West Thurrock Lakeside (AoCD003)

West Thurrock Lakeside (AoCD003)



Description:

West Thurrock is identified as an area of regeneration in the Thurrock Core Strategy. Although the Council has no recorded incidents of surface water flooding at this location, pluvial modelling has highlighted potential isolated areas at risk, for example the existing access to the Lakeside development along Fenner Road and underneath the A126.

No record of sewer flooding for this AoCD has been recorded on Anglian Water's register of flooded properties.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	73	41	41	110	0	0
IMD split (H:M:L)	0:0:0	0:0:0	0:73:0	0:1:40	0:1:40	0:2:108	0:0:0	0:0:0
Non-residential Properties								
Total	0	0	203	28	28	36	0	0
IMD split (H:M:L)	0:0:0	0:0:0	0:203:0	0:23:4	0:23:4	0:29:7	0:0:0	0:0:0
Critical Infrastructure								
Total	0	0	1	2	2	2	0	0

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	N/A	**TE2100 Policy**	N/A
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M4 – Preparedness & M3 - Protection (High priority)

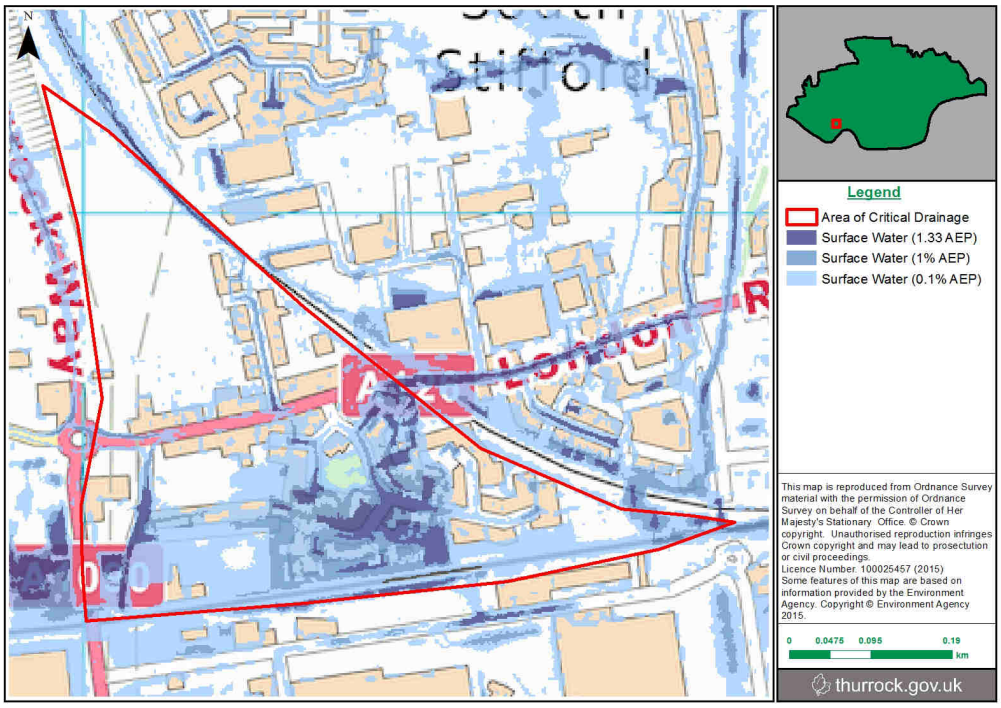
West Thurrock Lakeside (AoCD003)			
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Council Highways team to liaise with Emergency Planning team to ensure there is a road closure plan in place in case of flooding at the A126 junction
- Thurrock Council to liaise with Anglian Water and Lakeside to confirm the drainage network at the A126 junction. If the network is found to be under capacity, investigate options to install pumps or soakaways to alleviate flood risk

B.4 West Thurrock Residential East (AoCD004)

West Thurrock Residential East (AoCD004)



Description:

Pluvial modelling has shown that surface water flows from surrounding residential areas to the south of the AoCD and pools behind the railway embankment. Thurrock Council also has records of flooding in this location.

Anglian Water has a pumped system in this location which outfalls to a Network Rail maintained ditch south of Parsonage Road. Thurrock Council currently undertakes checks in this area to ensure local drainage ditches are maintained.

No record of sewer flooding for this AoCD has been recorded on Anglian Water's register of flooded properties.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	93	105	231	62	64	98	0	0
IMD split (H:M:L	0:93:0	0:105:0	0:231:0	0:62:0	0:64:0	0:98:0	0:0:0	0:0:0
Non-residential Properties								
Total	0	1	19	10	10	15	0	0
IMD split (H:M:L	0:0:0	0:1:0	0:19:0	0:10:0	0:10:0	0:15:0	0:0:0	0:0:0
Critical Infrastructure								
Total	1	0	6	2	2	3	0	0

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A

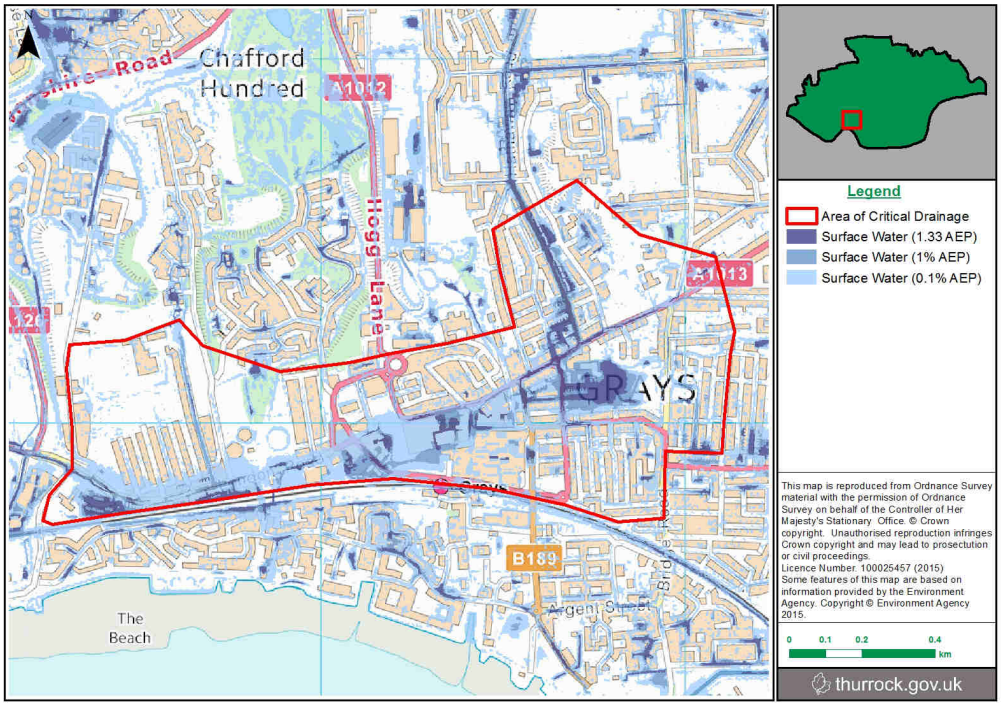
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	5	**TE2100 Policy**	4
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M2 – Prevention (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Use planning policy to ensure that nay development to the south of the embankment at Hadley Avenue does not add pressure to the existing drainage network and, if possible, provides betterment on the existing system.
- Liaise with Anglian Water to confirm network capacity within this AoCD. If there is capacity, Thurrock Council to consider adding more gullies to increase the volume of water entering the network during a storm event.
- Thurrock Council to liaise with Network Rail regarding maintenance programmes of Network Rail drainage ditches alongside the railway embankment.

B.5 Grays (AoCD005)

Grays (AoCD005)



Description:

Grays is located on the north bank of the River Thames.

Pluvial modelling has shown a number of isolated areas could be liable to surface water flooding including Florence Close, London Road, Maidstone Road, George Street and the Grays Park area. Modelling also shows surface water flows from the north into this AoCD and pools at low points in the catchment behind the railway line. Anglian Water operates a pumped network in this location.

Anglian Water's register of flooded properties includes properties within this AoCD.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	39	141	269	245	265	506	0	0
IMD split (H:M:L)	0:0:39	0:0:141	3:168:98	2:139:104	2:153:110	2:276:228	0:0:0	0:0:0
Non-residential Properties								
Total	0	31	141	94	96	201	0	0
IMD split (H:M:L)	0:0:0	0:0:31	19:88:34	21:55:18	22:55:19	36:121:44	0:0:0	0:0:0
Critical Infrastructure								
Total	0	1	8	7	7	8	0	0

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A

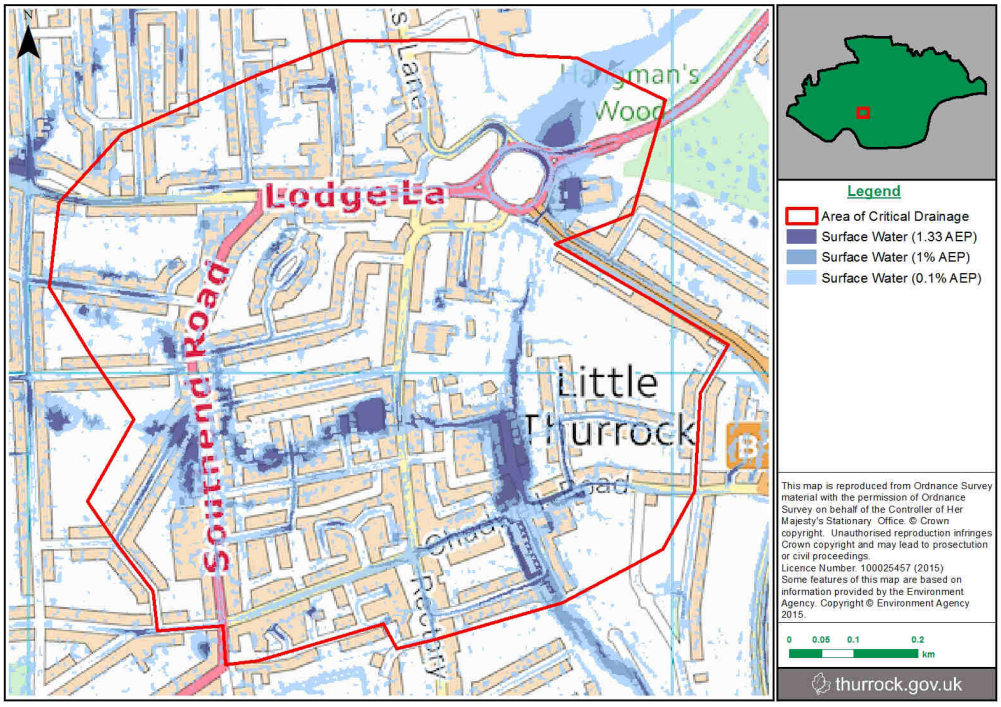
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	5	**TE2100 Policy**	4
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M2 – Prevention & M3 – Protection (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Thurrock Council to liaise with Anglian Water to investigate potential to increase capacity of local drainage network in the vicinity of Florence Close by increasing gully numbers. Need to confirm if there is capacity within the network and preferred approach to the scheme.
- Undertake a detailed drainage study at Grays Park to confirm if there is potential to create preferential flow paths and water storage in the park.
- Investigate the potential use of swales/French drains to attenuate and infiltrate runoff along Hathaway Road in a storm event, and reduce the volume of water ponding behind the rail embankment.
- Undertake feasibility study investigate the potential to create a small storage area on recreation ground near to Stifford Primary School to help reduce flows to the south that pool behind the railway embankment.
- Implement a preferential maintenance regime along roads to the west of the AoCD (including Roseberry Road, Castle Road & Belmont Road) to ensure that all flow is entering the drainage channels and not flowing over the road surface

B.6 Little Thurrock (AoCD006)

Little Thurrock (AoCD006)



Description:

Little Thurrock is situated in the centre of the Borough and has experienced surface water flooding in the past at Hollowfield Avenue and Rectory Road. The area is located in a topographical low and historic mapping indicates it was built where there was once a pond.

Water flows down Toft Avenue, Nunns Way and along Hollowfield Avenue to the junction with Chadwell Road where it pools. Surface water at this located is served by a series of gullies to a piped Anglian Water system which passes under Chadwell Road flowing south.

Pluvial modelling shows there is a flow path travelling from the sports ground in the north towards the allotments in the south.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	0	102	109	180	0	0
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:102	0:0:109	0:0:180	0:0:0	0:0:0
Non-residential Properties								
Total	0	0	0	20	20	23	0	0
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:20	0:0:20	0:0:23	0:0:0	0:0:0
Critical Infrastructure								
Total	0	0	0	1	1	1	0	0

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A

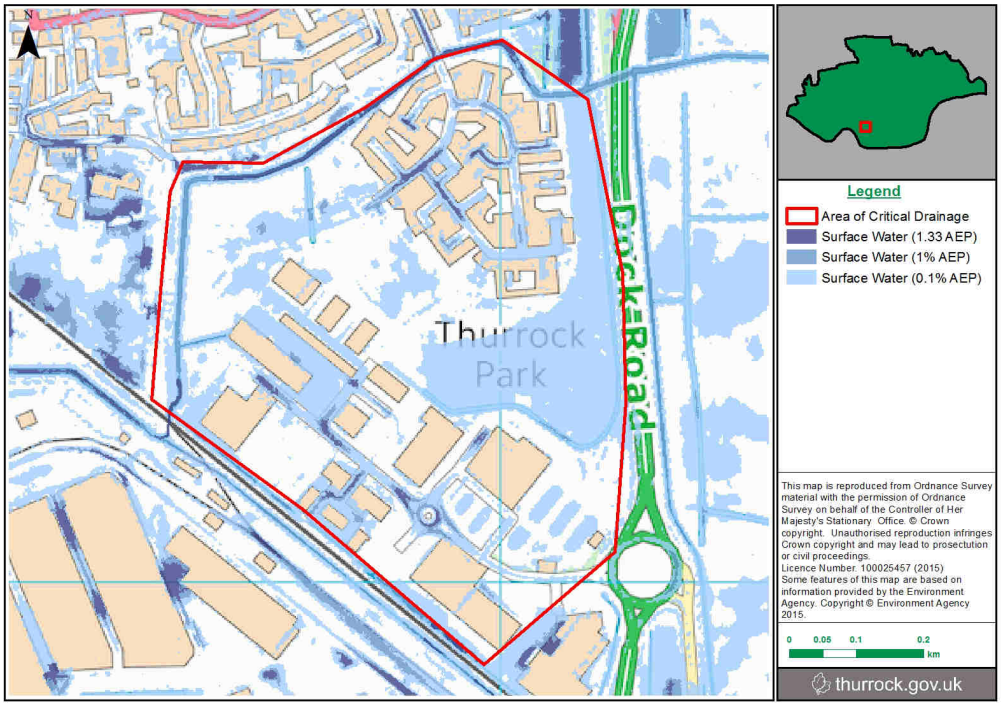
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	N/A	**TE2100 Policy**	N/A
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M3 – Protection (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Increase the number of gullies connecting to Anglian Water Drainage network (there is a 1350mm diameter pipe in this location which may have the potential to alleviate flooding.
- Create preferential flow routes by re-grading the road, raising kerb heights etc.
- Investigate the potential to create storage areas on land in the north of the AoCD located within a school playing field and sports ground.

B.7 Little Thurrock Marshes (AoCD007)

Little Thurrock Marshes (AoCD007)



Description:

Little Thurrock Marshes is located to the west of Tilbury in the south of Thurrock. The Council has records of Thurrock Park Way trading estate suffering from surface water flooding of both the highways and private land.

Highways drainage is provided by a series of pipe and gullies connecting to a ditch located to the south west of the trading estate and adjacent to the railway line. This ditch has, historically, not been well maintained due to ownership issues, which has led to issues with highways drainage. In addition, the low gradient on the system means water collects in low points, rather than flowing away, and the soft ground conditions of the area leads to movement in the local networks, causing further drainage problems.

Anglian Water only operates a foul network at this location; surface water drainage is privately owned with Thurrock Council providing highway drainage. There is the possibility that the private surface water drainage network has been connected to the highway system which is not adequately sized to take this additional flow.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	16	224	0	1	1	0	0
IMD split (H:M:L)	0:0:0	0:16:0	0:224:0	0:0:0	0:1:0	0:1:0	0:0:0	0:0:0
Non-residential Properties								
Total	0	51	28	2	2	12	0	0
IMD split (H:M:L)	0:0:0	0:51:0	0:28:0	0:2:0	0:2:0	0:12:0	0:0:0	0:0:0
Critical Infrastructure								
Total	0	1	5	1	1	1	0	0

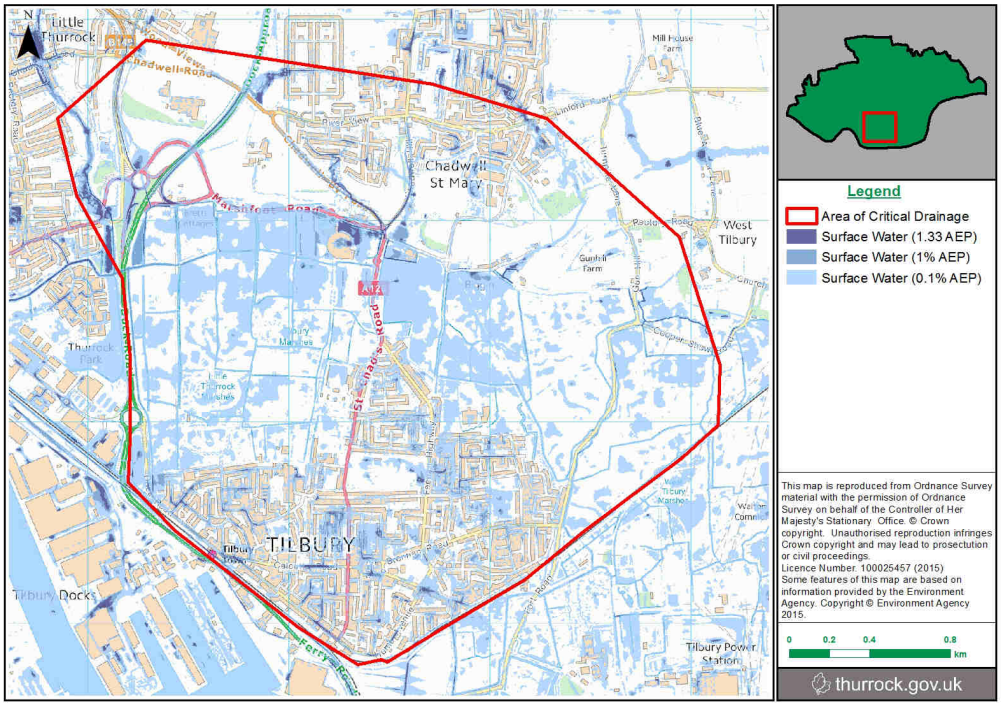
Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	5	**TE2100 Policy**	4
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M2 – Prevention (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Thurrock Council to liaise with Anglian Water to investigate possibilities of connection to 1500mm diameter pipe to alleviate standing water problems.
- Confirm and map ownership and maintenance, and identify 'mis-connections' to the highways drainage with reference to Council records, liaison with Environment Agency, Anglian Water and landowners. The process will be used to obtain information and potentially enforce maintenance of drainage assets

B.8 Tilbury (AoCD008)

Tilbury (AoCD008)



Description:

Tilbury is located in an area which has very flat topography and was at one time marshland associated with the River Thames. A railway line located to the south of Tilbury potentially acts as a barrier to flow. Surface water issues in the area stem from poor maintenance of local drainage channels; lack of surface water drainage outfalls; issues with tide-locking or existing drainage outfalls; the design of outfalls to the Thames and localised settling of properties. Some modelling studies looking into local drainage issues have been completed by Anglian Water who is responsible for much of the surface water sewer network in this area.

There are two distinct sections to the surface water drainage in Tilbury, split east and west by a small ridge of 'high ground' along St Marys Road

- The eastern section is pumped to tide via the Main River Chadwell Cross Sewer at World's End Pumping Station.
- The western section drains to tide via gravity at Botney Sluice and Chadwell Sluice which drains East Dock Sewer. This is a Main River watercourse that receives surface water sewer flow from Tilbury.

The EA maintain Main River watercourses using permissive powers afforded by the Water Resources Act 1991; however, the primary responsibility for maintenance activities rests with the riparian (land) owner.

Surface water runoff from the Tilbury urban area drains south to connect to the St Andrews Ferry Road system. The watercourse has a very shallow fall and splits at Hairpin Bridge, flowing north and south. Historically, there have been issues with the maintenance of local ditches due to conflicts of ownership and on-going problems with fly-tipping. This causes surface water to back up through the local drainage system and flood local highways and property.

Tilbury Flood Storage Area: The Tilbury Flood Storage Area was constructed in 1972 and is located to the north of Tilbury. It is designed to reduce surface water flood risk by storing water from the marshland and upstream areas. The 1971 engineer's report states it was designed to contain a 1 in 50 year rainfall event. Discharge from the storage area is controlled by World's End Pump and prevailing tide-locked conditions at Botney Sluice. An earth embankment borders the storage area and the northern side of Tilbury. In 1997 the storage area was designated a raised reservoir under the Reservoirs Act.

Tilbury (AoCD008)

In 2008 the Environment Agency commissioned a study of the flood storage area to improve their understanding of the catchment, including existing flood risk and future flood risk management opportunities[2].

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	139	851	3267	366	390	982	0	0
IMD split (H:M:L)	84:55:0	592:166:93	1900:845:522	262:62:42	279:66:45	698:189:95	0:0:0	0:0:0
Non-residential Properties								
Total	31	56	285	57	57	107	0	0
IMD split (H:M:L)	6:25:0	56:0:0	172:96:17	20:17:20	20:17:20	40:34:33	0:0:0	0:0:0
Critical Infrastructure								
Total	1	7	30	3	3	7	0	0

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	5	**TE2100 Policy**	4
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M3 – Protection (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

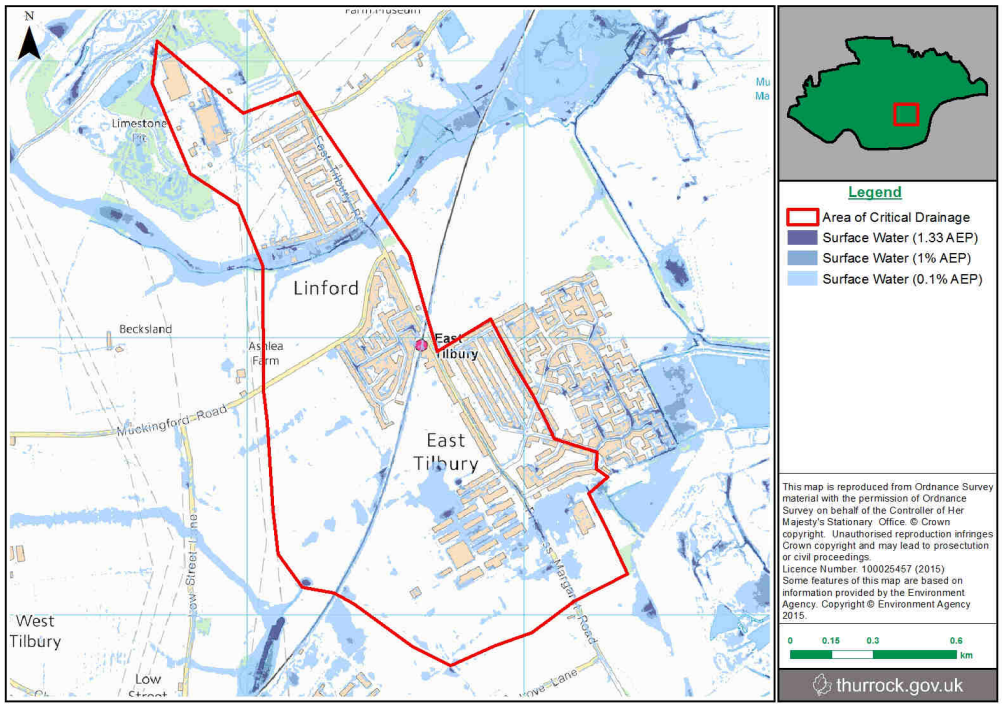
AoCD Specific Actions:

- Undertake assessment of drainage infrastructure outfalling to local drainage ditches. If there is not sufficient capacity within the system the potential for on-line attenuation prior to outfall into the watercourses should be investigated. Reference should be made to previous Environment Agency studies.
- Liaise with Network Rail to ensure culvert crossings are appropriately sized and are being maintained
- Thurrock Council to provide support to residents through creation of preferential flow paths or property level protection where local ground levels have altered and changed the flow regime
- Undertake Tilbury Integrated Flood Study to determine the interactions and interdependencies of flood risk sources and develop a strategy to mitigate

2 JBA Consulting (2010) Appraisal of Flood Risks and Management Strategy for Tilbury: Final Report.

B.9 East Tilbury (AoCD009)

East Tilbury (AoCD009)



Description:

East Tilbury is a village located in the east of Thurrock.

Anglian Water only provide a separate foul and surface water system in the north western corner of East Tilbury; the rest of the area has an un-adopted surface water system. This system was never adopted by Anglian Water and if there are issues they are reported to the Council's Environmental Health team.

Surface water drainage discharges via a pumped system to a ditch in the south eastern corner of the area. The ditch is not well maintained and ownership and responsibility for this ditch is not currently known.

Pluvial modelling has shown that small sections of the industrial estate located to the south west of East Tilbury may be inundated in a severe rainfall event and a flow path exists between the two urban centres.

Access to East Tilbury should be considered when planning for development in this area if the road were to flood.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	119	35	38	49	0	0
IMD split (H:M:L)	0:0:0	0:0:0	0:0:119	0:0:35	0:0:38	0:0:49	0:0:0	0:0:0
Non-residential Properties								
Total	0	0	55	13	14	20	0	0
IMD split (H:M:L)	0:0:0	0:0:0	0:0:55	0:0:13	0:0:14	0:0:20	0:0:0	0:0:0
Critical Infrastructure								
Total	0	0	3	0	0	0	0	0

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A

East Tilbury (AoCD009)			
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	6	**TE2100 Policy**	3
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	N/A
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Thurrock Council and Anglian Water to meet to discuss adoption of both foul and surface water sewer network in this AoCD.
- Ensure a separate surface water and foul water system is provided as part of any new development and is adopted by Anglian Water
- Surface water ditch in the south eastern corner of East Tilbury contains all of the town's surface water drainage; ownership and maintenance responsibilities are unknown.

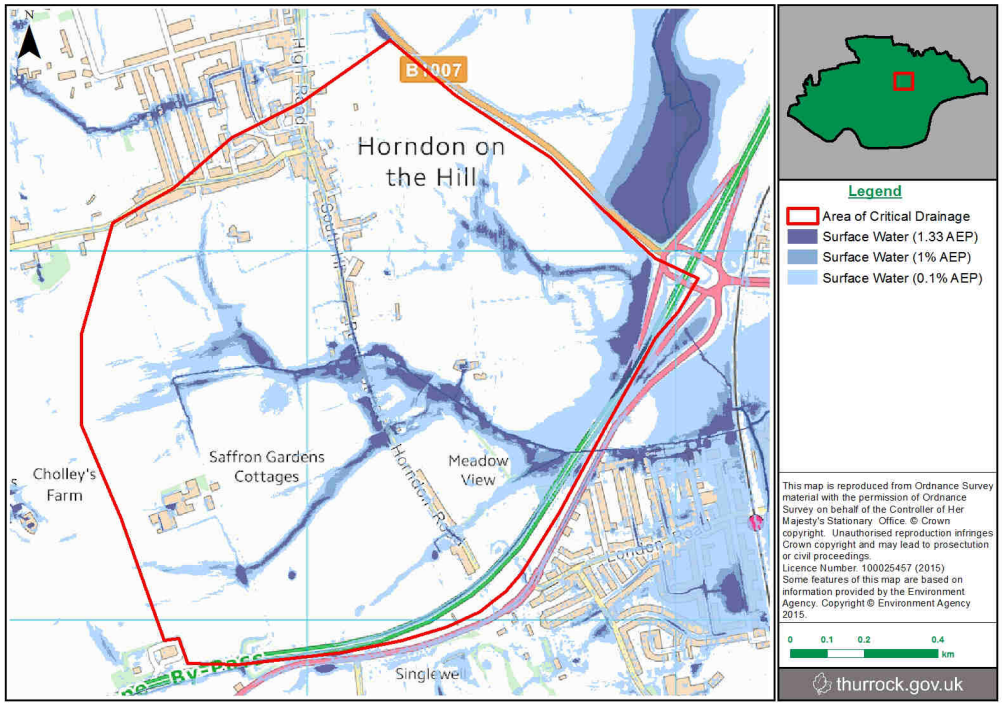
B.10 Stanford-le-Hope

Stanford-le-Hope is located in the east of Thurrock, bordered by the A13 to the north and the Thames Estuary to the south. The northern boundary is located in a topographical depression and surface water flooding in this location has been through a combination of overloading of foul systems and ownership/maintenance issues with records to local drainage ditches.

Areas at most risk of surface water flooding are located along the north western fringe of the urban area along the A13.

B.10.1 North West Stanford-le-Hope (AoCD010a)

North West Stanford-le-Hope (AoCD010a)



Description:

Surface water modelling shows pooling of surface water from agricultural land behind the highway embankment. At this point there is a culvert which passes flow to the Butts Lane area of Stanford-le-Hope. The Council do not have any records of flooding at this location as the flooding would occur in farmland. However, surface water from this location contributes to flooding in the centre of Stanford-le-Hope.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	0	11	13	15	0	67
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:11	0:0:13	0:0:15	0:0:0	0:0:67
Non-residential Properties								
Total	0	0	0	8	8	12	0	23
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:8	0:0:8	0:0:12	0:0:0	0:0:23
Critical Infrastructure								
Total	0	0	0	0	0	0	0	1

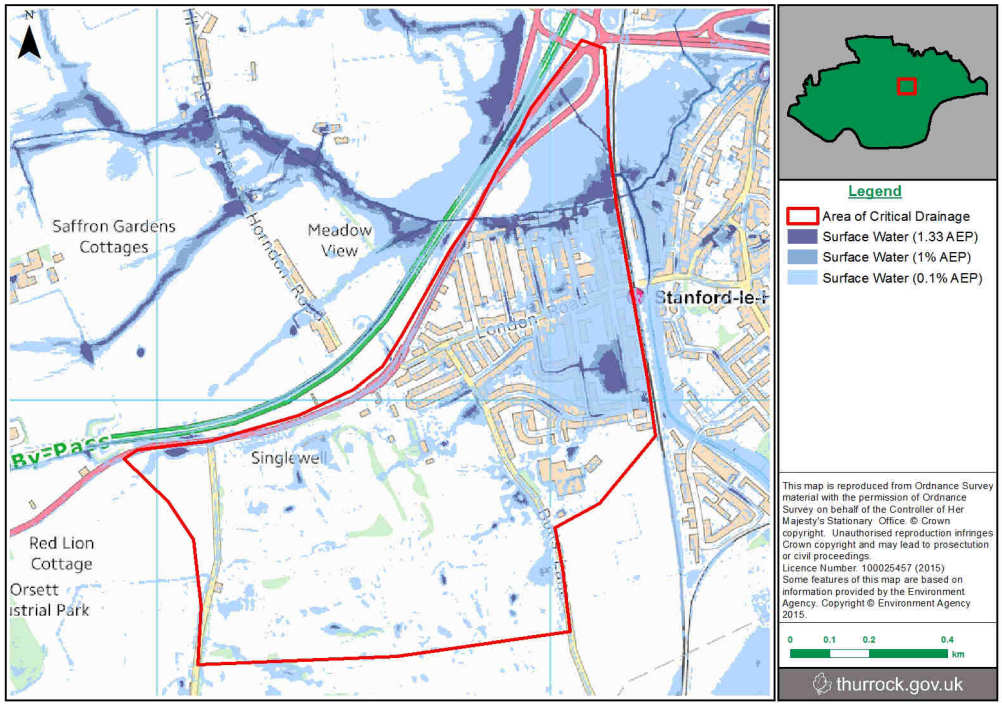
North West Stanford-le-Hope (AoCD010a)			
Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	N/A	**TE2100 Policy**	N/A
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M3 – Protection (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- There may be potential for installation of a detention basin on farmland to the north of the A13. Further investigation into the size of the catchment at this location would be required to assess the potential impact that this option could have on the downstream catchment.

B.10.2 South East Stanford-le-Hope (AoCD010b)

South East Stanford-le-Hope (AoCD010b)



Description:

This AoCD is located in a topographical low and there is a large catchment for surface water flowing along Buckingham Hill Road and Stanford Road. Surface water from the highway drainage system enters a small drainage ditch which flows to the rear of properties along Valmar Avenue and Prospect Avenue, which is in part open channel and part culverted. There is no access for maintenance of the drainage ditch and it is suspected that the watercourse is blocked by garden waste leading to overland flow following the topographical low. Thurrock Council has now diverted inflows to the highway system as a result of the recent development on Butts Lane.

Surface water outfalls to the local watercourse known as 'The Hope'. Historically there has been issued with regards to maintenance of this watercourse and it is prone to silt build up.

Open land to the south of the A13 roundabout (east/west of the railway line) is identified as being at risk of surface water flooding.

The Council has records of flooding at Runnymede Road.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	13	209	121	133	172	0	351
IMD split (H:M:L)	0:0:0	0:0:13	0:0:209	0:0:121	0:0:133	0:0:172	0:0:0	0:0:351
Non-residential Properties								
Total	1	6	9	16	16	0	0	44
IMD split (H:M:L)	0:0:1	0:0:6	0:0:9	0:0:16	0:0:16	0:0:19	0:0:0	0:0:44
Critical Infrastructure								
Total	0	0	3	2	2	3	0	4

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP	5	**South Essex CFMP**	4

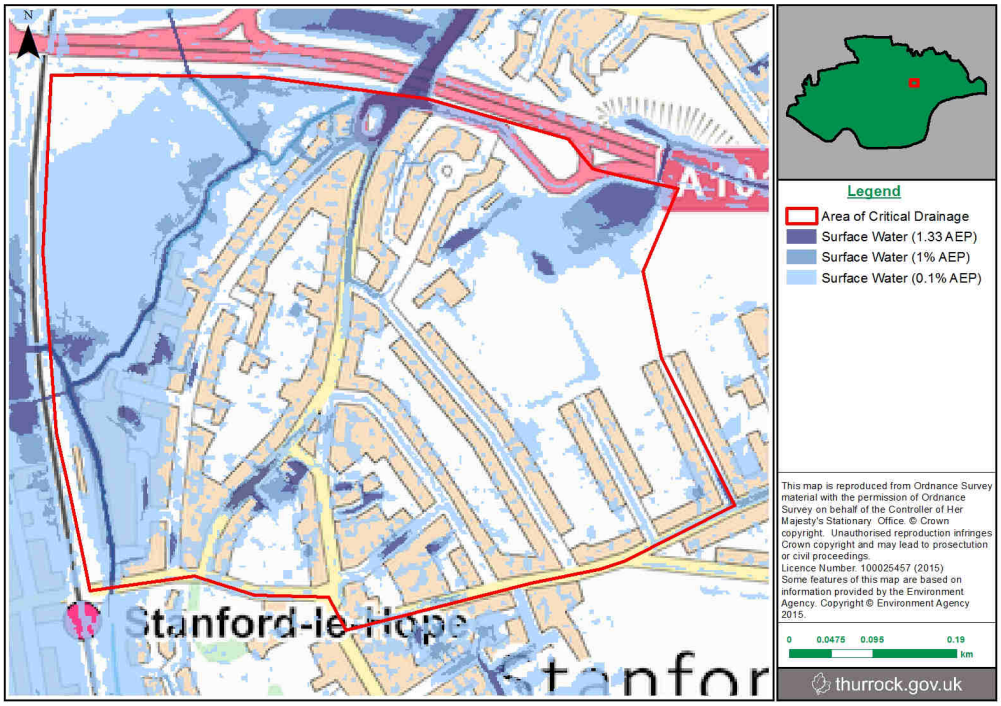
South East Stanford-le-Hope (AoCD010b)			
Policy sub area		**Policy**	
TE2100 Action Zone	6	**TE2100 Policy**	3
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M2 – Prevention (High priority); M4 – Preparedness (Very high priority) & M6 – Other (Moderate priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Identify recreation ground as a surface water flood storage area in asset register. Complete condition survey of the outfall from the recreation ground and confirm how it reconnects to the Stanford Brook. Undertake any required remedial action.
- Open land in Stanford-le-Hope and Runnymede recreation ground act as flood storage areas; these should be identified as such in the asset register and highlighted to development control teams. Any development in these areas would require level for level floodplain compensation.
- Ensure that new development invests in the local surface water network. The network is currently at capacity.

B.10.3 Eastern Stanford-le-Hope (AoCD010c)

Eastern Stanford-le-Hope (AoCD010c)



Description:

Surface water from the Victoria Road brook causes flooding in the north western corner of this AoCD. In addition, overland flow from Fetherston Road in the east flows towards this watercourse.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	6	45	0	41	42	78	0	622
IMD split (H:M:L)	0:0:6	0:0:45	0:0:0	0:0:41	0:0:42	0:0:78	0:0:0	0:0:622
Non-residential Properties								
Total	7	12	2	31	32	42	0	161
IMD split (H:M:L)	0:0:7	0:0:12	0:0:2	0:0:31	0:0:32	0:0:42	0:0:0	0:0:161
Critical Infrastructure								
Total	0	1	0	0	0	0	0	10

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	N/A	**TE2100 Policy**	N/A

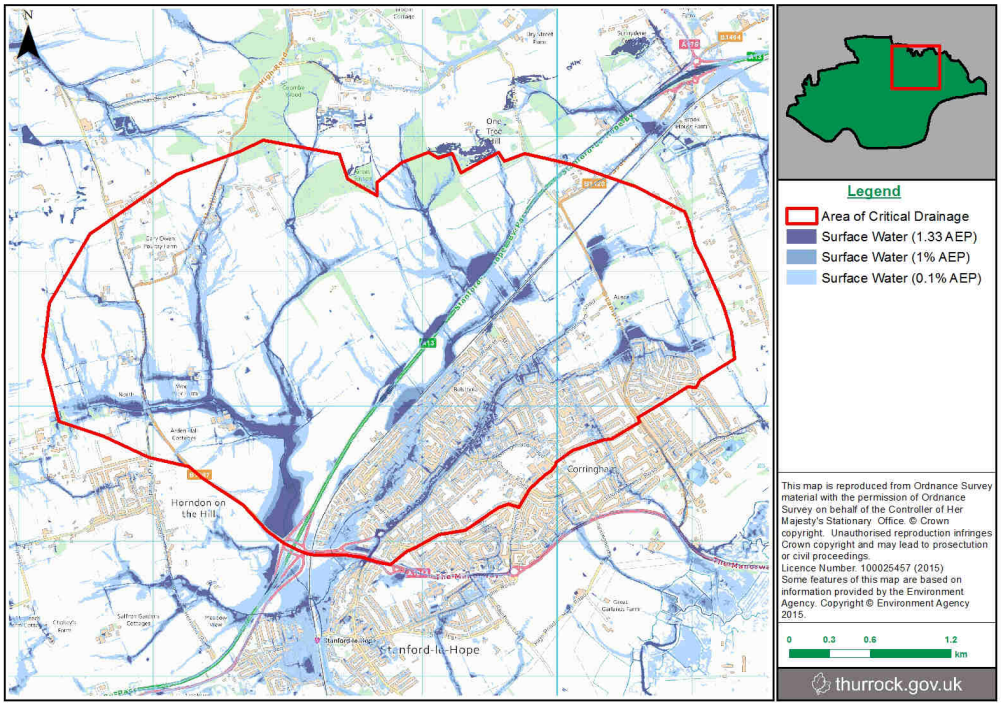
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M2 – Prevention (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Thurrock Council should confirm with EA the maintenance regime for Victoria Road brook. If it is a low priority, the Council should work with local community to help maintain the brook.

B.10.4 North East Stanford-le-Hope (AoCD010d)

North East Stanford-le-Hope (AoCD010d)



Description:

North East Stanford-le-Hope is located in a topographical depression. Surface water flooding in this location has been caused by a combination of overloading of foul systems, and ownership/maintenance issues with regard to local watercourses.

Wharf Road has been highlighted by the Council as an area where surface water flooding has been experienced in the past due to pump failure. This has now been addressed by the Council.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	3	8	395	430	458	1360	3	3278
IMD split (H:M:L)	0:0:3	0:0:8	0:0:395	0:83:347	0:86:372	0:168:1192	0:1:2	0:284:2994
Non-residential Properties								
Total	0	0	8	51	53	115	11	131
IMD split (H:M:L)	0:0:0	0:0:0	0:0:8	0:7:44	0:8:45	0:8:107	0:0:11	0:8:123
Critical Infrastructure								
Total	0	0	3	3	3	5	0	25

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	N/A	**TE2100 Policy**	N/A
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M3 – Protection (High priority) & M4 – Preparedness (Very high priority)

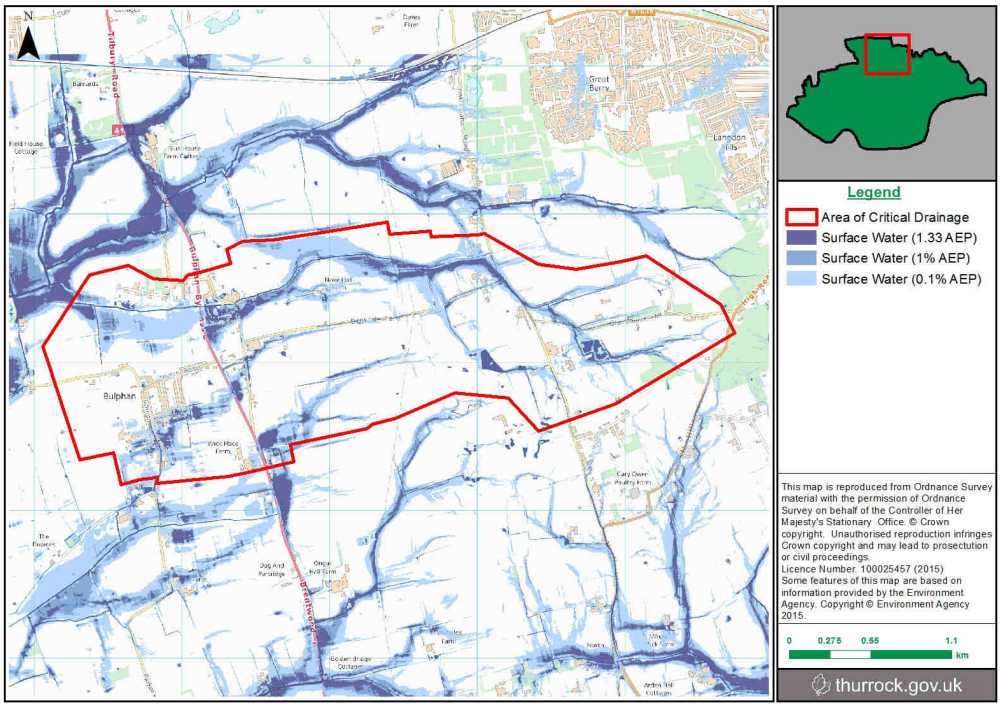
North East Stanford-le-Hope (AoCD010d)			
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Pluvial modelling identifies the Southend Road as a major flow path for surface water. There is potential to provide extra gully connections to Anglian Water's system along Southend Road where a 1450mm diameter sewer is located. More water entering this system will result in less pooling of water at the Bypass junction at Manorway.
- Thurrock Highways team to ensure an emergency plan and traffic management plan is in place for Southend Road underpass during flood events.
- Pluvial modelling shows two flow paths from farmland in the north and northeast of the AoCD that flow into Hassen Brook. Further investigation should be undertaken to determine the effects of providing storage in the north of the catchment.
- Feasibility study into the potential creation of a storage area between the A13 and railway line with a flow control limiting surface water flow entering the Hassen Brook from the north of the catchment
- Investigate potential for flood storage in Balstonia Recreation Ground to reduce the impact of flooding on Bramley.

B.11 Bulphan (AoCD011)

Bulphan (AoCD011)



Description:

Bulphan is located in the north of the Borough within the Mar Dyke catchment.

Flooding has been attributed to short, intense periods of rainfall. The village is located in a fenland area with a naturally flat topography which may result in ponding of surface water. In addition, surface water will flow from high ground in the east towards Bulphan, exacerbating the surface water flooding issue.

Environment Agency surface water mapping and local knowledge has highlighted 'hot spots' within the AoCD where surface water flooding has a greater potential, China Lane and Fen Close.

Flooding in China Lane and Fen Close was primarily due to surcharging of the foul water system during rainfall events. This then backflowed into property. The foul water system is a pumped system and is located in a natural low point. Houses were historically served by soakaways but it is believed that, over time, these had been connected to the foul water system leading to overloading of the system.

Anglian Water completed improvement works in 2014/2015.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	5	0	31	0	0	57	272	13
IMD split (H:M:L)	0:0:5	0:0:0	0:0:31	0:0:0	0:0:0	0:0:57	0:0:272	0:0:13
Non-residential Properties								
Total	36	0	13	0	0	69	257	26
IMD split (H:M:L)	0:0:36	0:0:0	0:0:13	0:0:0	0:0:0	0:0:69	0:0:257	0:0:26
Critical Infrastructure								
Total	0	0	0	0	0	1	4	0

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A

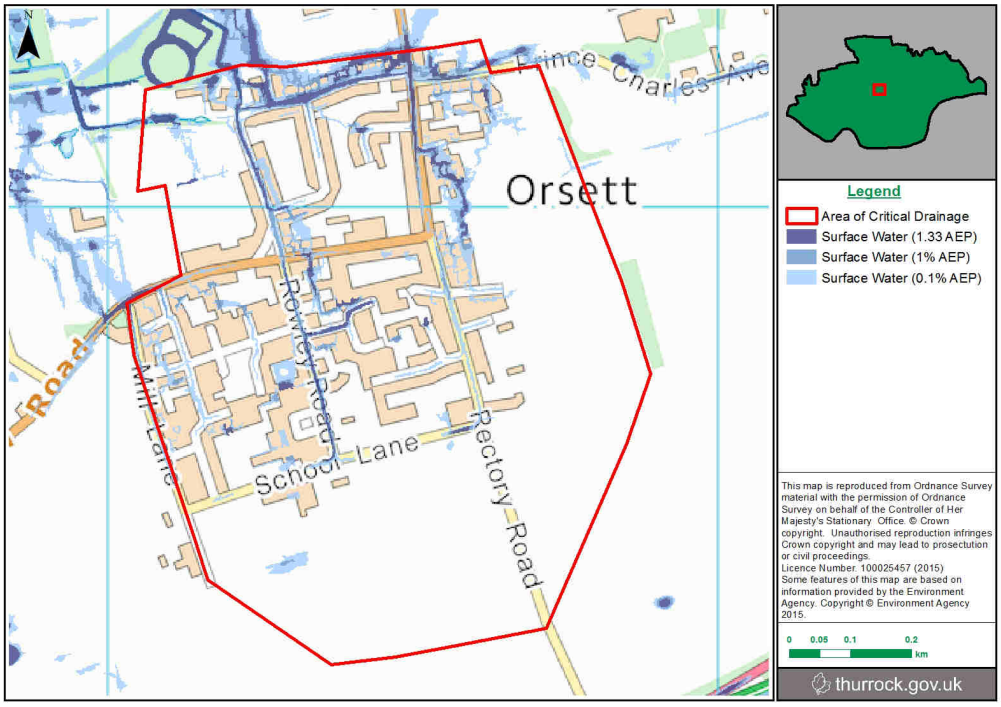
Bulphan (AoCD011)			
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4
TE2100 Action Zone	N/A	**TE2100 Policy**	N/A
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M4 – Preparedness (Very high)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Investigate 'misconnections' and educate homeowners on responsibilities regarding property drainage
- Liaise with EA regarding need and opportunities for flood defence schemes, such as flood storage areas, on Main Rivers located across the AoCD

B.12 Orsett (AoCD012)

Orsett (AoCD012)



Description:

Located in the centre of the Borough, the Environment Agency's updated Flood Map for Surface Water shows that surface water flows to the north where it pools on Malting Lane.

Thurrock Council has records of flooding on Rectory Road.

Anglian Water operate separate foul and surface water sewer networks in this location. The surface water sewers outfall to drainage ditches to the north of Orsett.

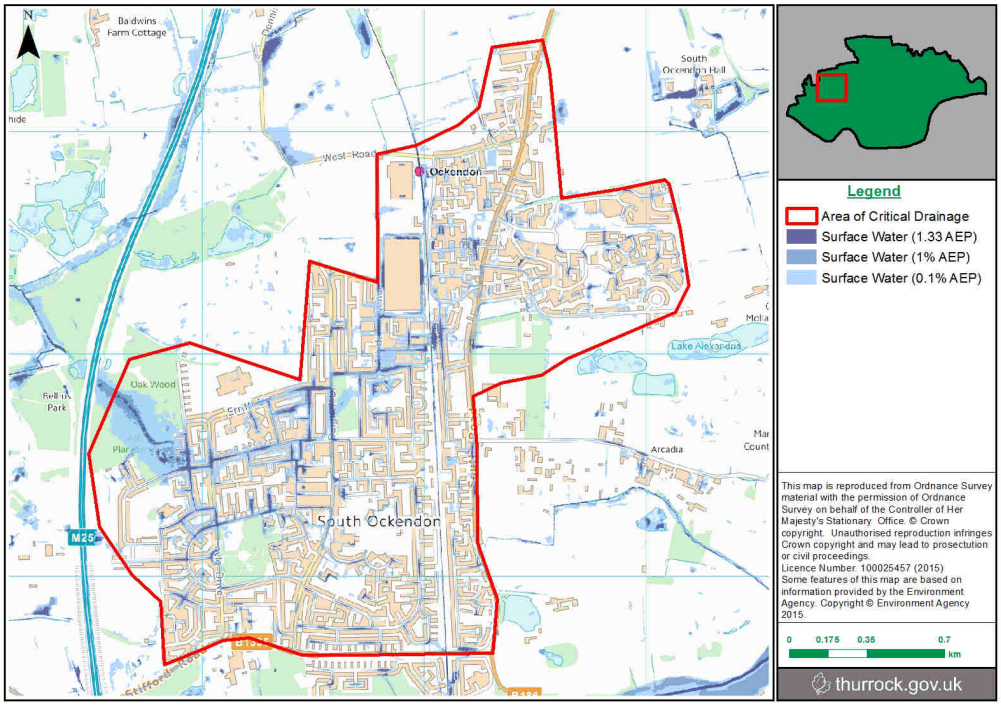
	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	0	0	0	38	0	174
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:0	0:0:0	0:0:38	0:0:0	0:0:174
Non-residential Properties								
Total	0	0	0	0	0	14	0	29
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:0	0:0:0	0:0:14	0:0:0	0:0:29
Critical Infrastructure								
Total	0	0	0	0	0	0	0	1

AoCD Specific Actions:

None

B.13 South Ockendon (AoCD013)

South Ockendon (AoCD013)



Description:

Thurrock Council has records of sewer flooding at Buckles Lane in South Ockendon. Local knowledge suggests that the lane was created as access to a mineral site which has subsequently been developed into Grangewaters Outdoor Activity Centre by Thurrock Council.

The highways were, historically, served by drainage ditches on either side of the lane and a small gulley/pipe carrier system which conveyed surface water to the ponds and Grangewaters. Over time local ground profiles have been altered and roadside ditches filled in without planning permission. This has resulted in failure of the local drainage system causing surface water to flow down the highway rather than alongside it.

Anglian Water operate a separate foul and surface water system with positive drainage to outfalls to the Mar Dyke in the south, to local drainage ditches in the north, and to an existing system in the Ford Factory site.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	0	0	0	503	5916	1104
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:0	0:0:0	123:205:175	2177:2151:1588	302:539:263
Non-residential Properties								
Total	0	0	0	0	0	44	459	28
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:0	0:0:0	8:24:12	125:217:117	4:19:5
Critical Infrastructure								
Total	0	0	0	0	0	4	40	6

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	3

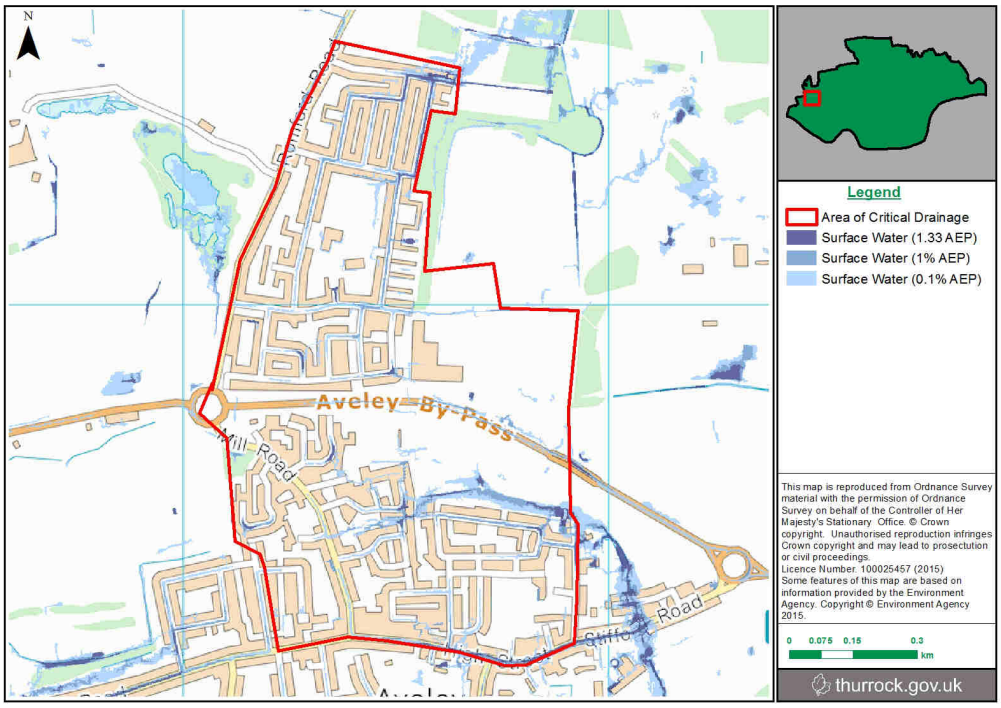
South Ockendon (AoCD013)			
TE2100 Action Zone	N/A	**TE2100 Policy**	N/A
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M3 – Protection (High priority) & M6 – Other (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Development at the Ford site needs to be controlled. Currently the Anglian Water system connects to a separate system but re-joins a combined system which has insufficient capacity. Any redevelopment of this site will need developers to provide a new separate drainage system.
- Thurrock Council should consider adopting the highway drainage from Buckles Lane, which is currently privately owned. The drainage ditches need to be reinstated and maintained. If new drainage is damaged by illegal development, the Council should take measures to pursue through the legal system.

B.14 Aveley (AoCD014)

Aveley (AoCD014)



Description:

Surface water runoff south of the Aveley Bypass flows in a southerly direction towards local drainage ditches where there have been records of flooding. Anglian Water surface water sewers outfall to local drainage ditches at Aveley Primary School which then flows towards the Mar Dyke.

Thurrock Council has records of flooding on Stanford Gardens.

	NaFRA (fluvial and tidal)			Surface Water			Groundwater	
	High Risk	Medium Risk	Low Risk	3.33% AEP	1% AEP	0.1% AEP	High Risk	Medium Risk
Residential Properties								
Total	0	0	0	0	0	34	0	760
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:0	0:0:0	0:32:2	0:0:0	0:760:0
Non-residential Properties								
Total	0	0	0	0	0	1	0	18
IMD split (H:M:L)	0:0:0	0:0:0	0:0:0	0:0:0	0:0:0	0:1:0	0:0:0	0:18:0
Critical Infrastructure								
Total	0	0	0	0	0	1	0	6

Thames CFMP Policy sub unit	N/A	**Thames CFMP Policy**	N/A
South Essex CFMP Policy sub area	5	**South Essex CFMP Policy**	4

TE2100 Action Zone	N/A	**TE2100 Policy**	N/A
Thames FRMP management catchment	South Essex	**FRMP Measure / Priority**	M2 – Prevention (High priority)
Thames RBMP Catchments	South West Essex	**RBMB Identified Actions**	No key actions identified

AoCD Specific Actions:

- Thurrock Council to undertake asset survey and consider adopting maintenance of ditches that fall into 'no-man's land' to ensure future maintenance responsibilities
- Investigate drainage capacity due to increased pressure from future development in this area. Where there is limited capacity, development policy should ensure development invests in the surface water drainage network

C Communication and engagement

During the development of this Local Strategy, we have prepared and issued a local flooding questionnaire. The objective of the questionnaire was to gather local flooding knowledge and to understand the public views and experiences of flooding so this could inform the preparation of our Flood Strategy.

The responses to key questions asked in the questionnaire are outlined below

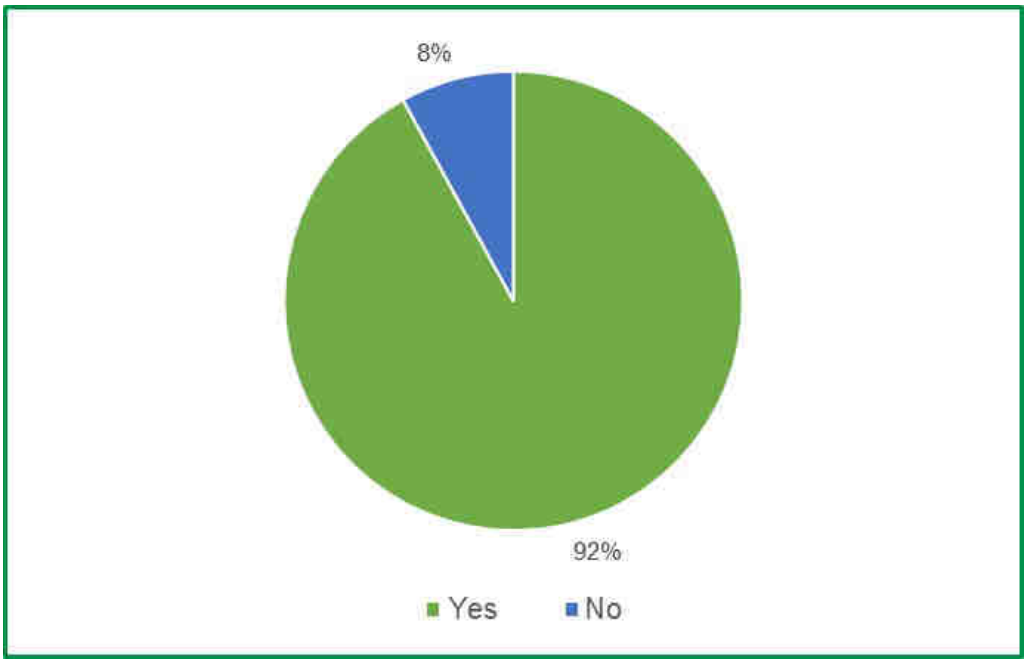
C.1 Questionnaire responses

The results displayed are those recorded directly from the questionnaire. They have had no additional interpretation and present the public perception of flood risk in Thurrock. It has been assumed the questionnaire responses are representative of Thurrock Borough as a whole.

Note: not all respondents provided a response to all questions.

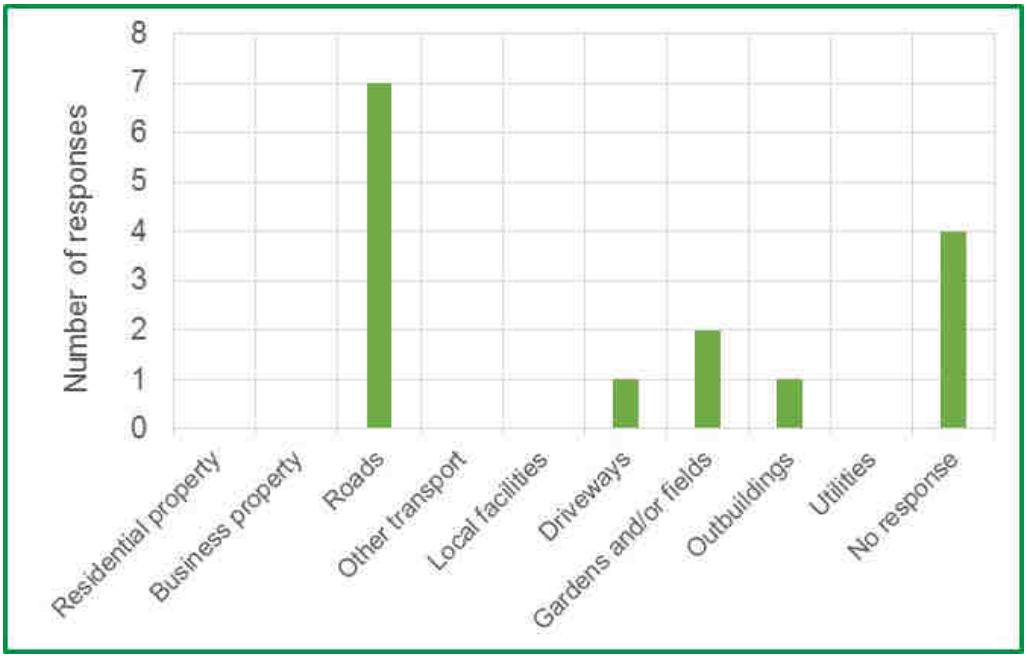
C.1.1 Have you been affected by flooding?

The majority of respondents have been affecting by flooding in the past (92%)



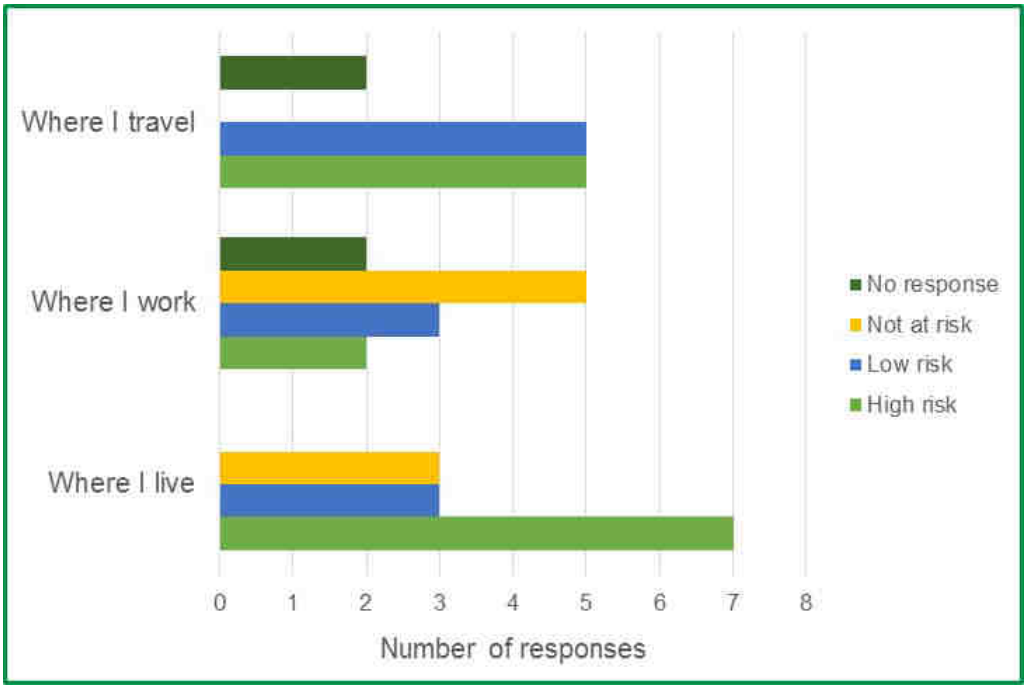
C.1.2 What was flooded?

Of the respondents the majority had been affected by flooding to roads. None of the respondents had been affected by flooding to residential or business property.



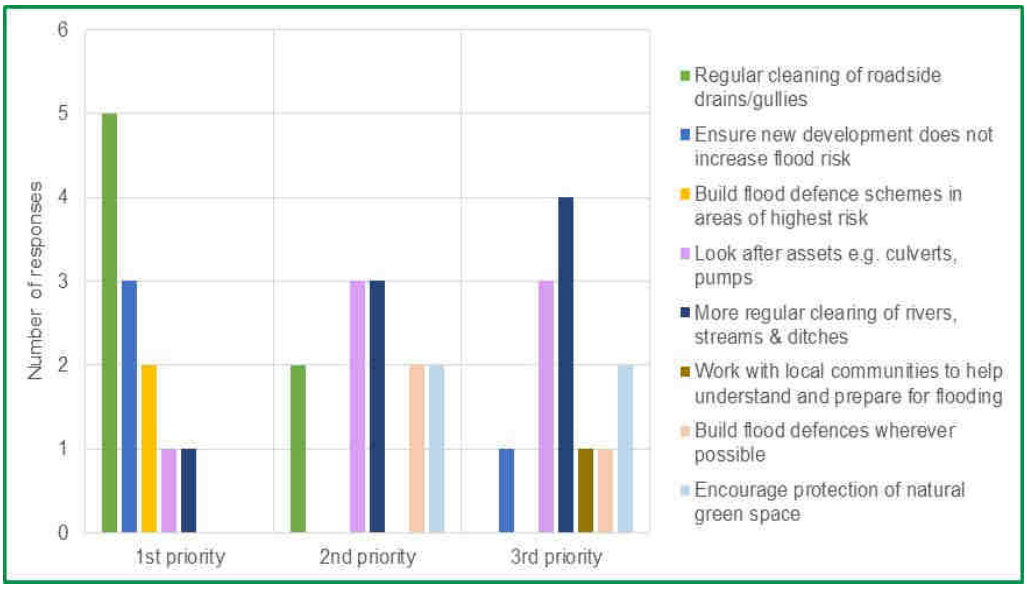
C.1.3 Do you consider that you are in an area of high, low or no flood risk?

Of the respondents, over half considered where they lived to be at high risk of flooding. The majority of respondents considered where they work to not be at risk, whilst the risk to where respondents travel was split evenly between low and high risk.



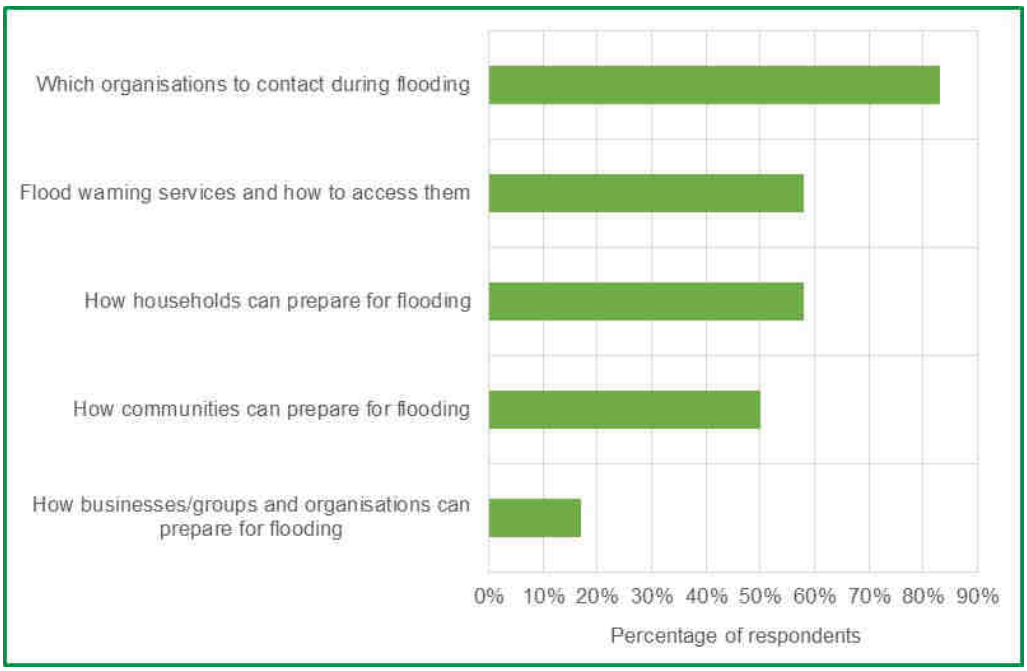
C.1.4 What do you think the Council and its partners should be doing to manage flood risk in the area?

Of the respondents, almost half thought regular cleaning of roadside drains and gullies should be the Council and its partner's highest priority.



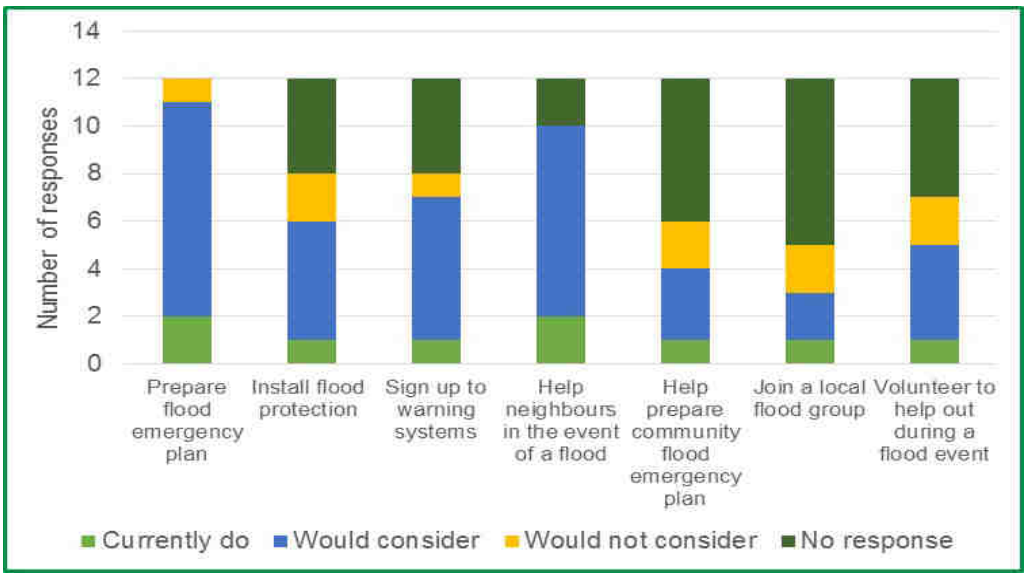
C.1.5 Which of the following topics would you like information and advice to be more easily available?

Over 80% of respondents to the questionnaire would like more information and advice on which organisation to contact during flooding, and over 65% would like more information and advice on flood warning services and how to access them, and on how households can prepare for flooding.



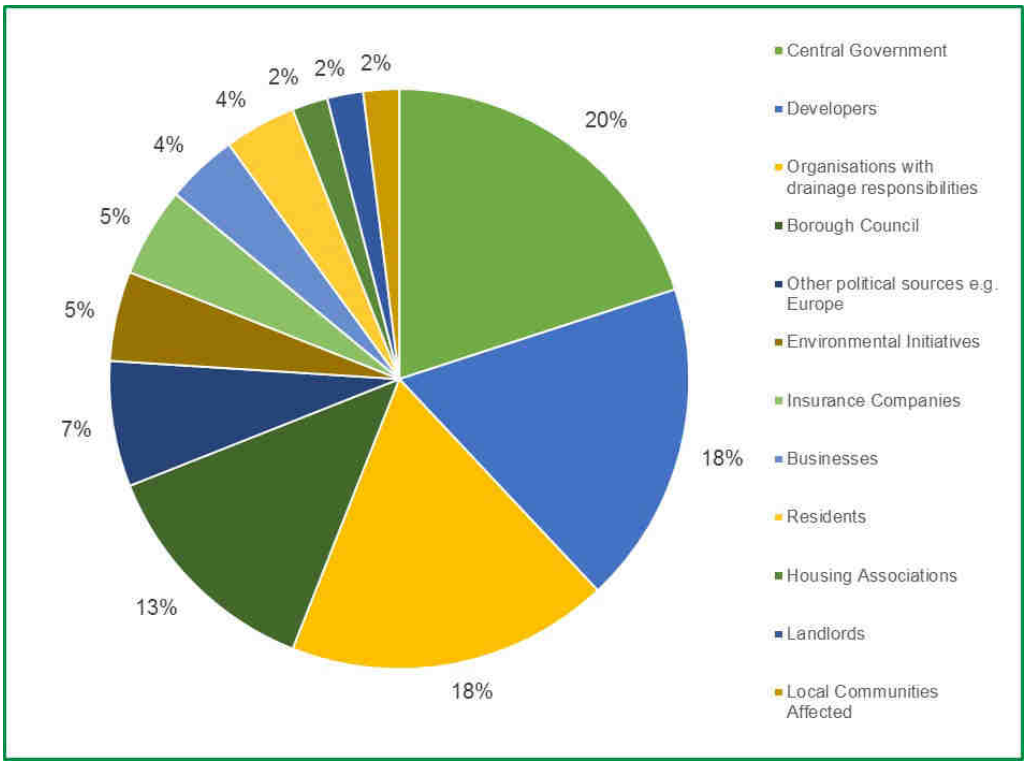
C.1.6 Which of the following things do you do now or would consider in the future to prepare for flooding?

Of the respondents, the majority would consider preparing a flood emergency plan as well as helping neighbours in the event of a flood. Few respondents would consider joining a local flood group or help prepare a community flood emergency plan.



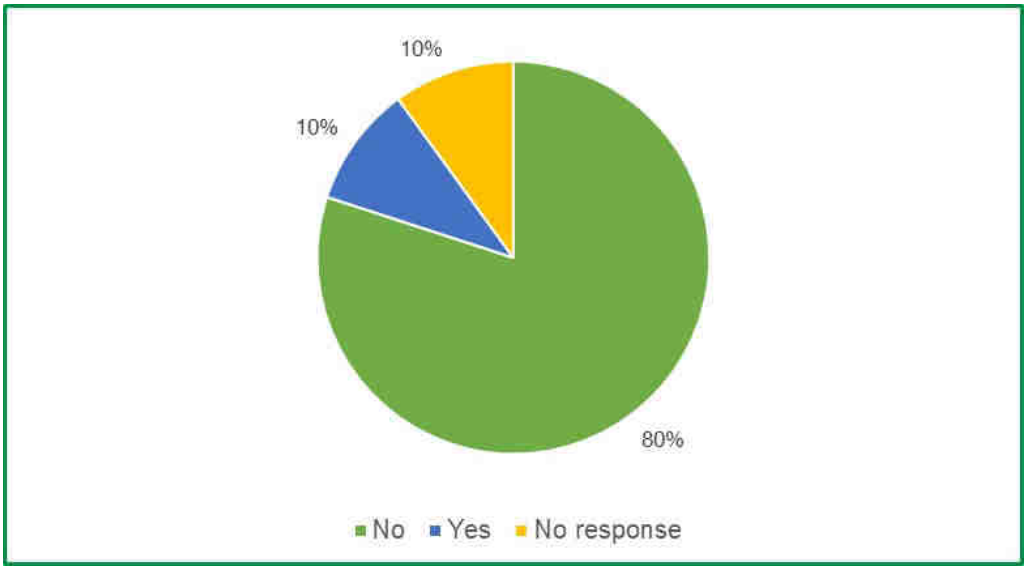
C.1.7 Where do you think money should be found to pay to manage flood risk?

The majority of respondents believed money to pay to manage flood risk should come from Central Government (20%), developers (18%), organisations with drainage responsibilities (18%) and the local council (13%).



C.1.8 Did you know Thurrock Council was a Lead Local Flood Authority before this survey?

Of the respondents, the majority (80%) did not know Thurrock Council was a Lead Local Flood Authority.



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D Strategic Environmental Assessment

D.1 SEA Screening Report

D.2 SEA Scoping Report

D.3 SEA Scoping Report – consultation response

D.4 Environmental Assessment Report

D.5 Post Adoption Statement

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E Legislative context

Table E-2 Legislative context for the Local Strategy

Legislation	
Flood and Water Management Act (2010)	The Act makes provision for better, more sustainable, management of flood risk for people, homes and businesses establish strategic responsibility in managing flood risk and protect water supplied to the consumer. The FWMA sets out the role of Thurrock Council as LLFAs and sets out a range of powers and responsibilities such as the duty for all RMAs to co-operate with each other, and provides Lead Local Flood Authorities (LLFA) and the Environment Agency with a power to request information required in connection with their flood risk management functions. Section 9 of the FWMA requires LLFAs to develop, maintain, apply and monitor a strategy for local flood risk management in its area. This document is the South East London Local Flood Risk Management Strategy.
Flood Risk Regulations (2009) and EU Floods Directive (2007)	The Flood Risk Regulations (FRR) transposes the European Floods Directive into UK Law. Its purpose is to establish a framework for assessing and managing flood risk, aimed at reducing the negative impact of flooding on human health, the environment, cultural heritage and economic activity across the European Community. The Directive was developed in response to a number of extreme flooding events suffered across the EU and aims to establish effective cross-border flood risk management to address this. The Directive required Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. This is defined as “Flood Risk Area” in the FRR. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.
The Land Drainage Act (1991 and amended in 1994)	The Land Drainage Act 1991 requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. The riparian owner must accept the natural flow from upstream but need not carry out work to cater for increased flows resulting from some types of works carried out upstream, for example a new housing development. If a riparian owner fails to carry out his responsibilities under the Land Drainage Act, or if anyone else causes a watercourse to become blocked or obstructed, the County and District Councils have powers of enforcement by serving a notice under the Act. If this is ignored, the Council concerned may carry out the necessary itself and then recharge the person responsible for the full cost incurred. The 1994 Act amends the Land Drainage Act of 1991 in relation to the functions of internal drainage boards and local authorities.
Water Resources Act (1991)	This Act aims to prevent and minimise pollution of water. The policing of this act is the responsibility of the Environment Agency. Under the act it is an offence to cause or knowingly permit any poisonous, noxious or polluting material, or any solid waste to enter any controlled water. Silt and soil from eroded areas are included in the definition of polluting material. If eroded soil is found to be polluting a water body or watercourse, the Environment Agency may prevent or clear up the pollution, and recover the damages from the landowner or responsible person.
EU Water Framework Directive (2000)	This Directive sets out to establish a Community framework for the protection of surface waters and groundwater across the EU. It aims to provide a common approach with common objectives, principals and basic measures designed to prevent any further deterioration of surface and ground waters and to protect and enhance the quality and quantity of aquatic eco-systems and, with regard to their water needs, terrestrial systems.

Legislation	
Strategic Environmental Assessment Directive (2001)	The SEA Directive applies to a wide range of public plans and programmes (e.g. on land use, transport, energy, waste, agriculture, etc.). The SEA Directive does not refer to policies. Plans and programmes in the sense of the SEA Directive must be prepared or adopted by an authority (at national, regional or local level) and be required by legislative, regulatory or administrative provisions. An SEA is mandatory for plans/programmes which: • Are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive. OR • Have been determined to require an assessment under the Habitats Directive. Broadly speaking, for the plans/programmes not included above, the Member States have to carry out a screening procedure to determine whether the plans/programmes are likely to have significant environmental effects. If there are significant effects, an SEA is needed. The screening procedure is based on criteria set out in Annex II of the Directive.
Civil Contingencies Act (2004)	The Civil Contingencies Act establishes a new legislative framework for civil protection in the United Kingdom. It imposes a clear set of roles and responsibilities on those organisations with a role to play in preparing for and responding to emergencies. Local authorities are a Category 1 responder under the Act, and have a key role to play in respect in discharging their duties in the legislation. The Act, and accompanying Regulations and guidance, delivers a single framework for civil protection in the United Kingdom capable of meeting the challenges of the twenty first century.
Climate Change Act (2008)	The Act sets up a framework for the UK to achieve its long-term goals of reducing greenhouse gas emissions and to ensure steps are taken towards adapting to the impact of climate change. Its main elements are: • Setting emissions reduction targets in statute and carbon budgeting. • A new reporting framework. • The creation of an independent advisory body. • Trading scheme powers • Adaptation • Policy measures which reduce emissions.
Conservation of Habitats and Species Regulations (2010)	The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species. The Habitats Regulations transpose the Habitats Directive in England, Wales and to a limited extent Scotland by ensuring that activities are carried out in accordance with the requirements of the Directive.
The Localism Act (2011)	The Localism Act contains a wide range of measures to devolve more powers to councils and neighbourhoods and give local communities greater control over local decisions like housing and planning.
National Planning Policy Framework (2012)	The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.
The Water Act (2014)	Water Act will, for the first time, mean businesses, charities and public sector customers will have the freedom to switch supplier from 2017. The Act will: • Address growing pressure on water resources by making our supply more resilient; • Help join up the national water network, by making it easier for water companies to buy and sell water from each other; • Increase competition and encourage new entrants to the market who can offer alternative sources of water or innovative ways of treating sewerage; and Ensure that hundreds of thousands of households in the highest flood risk areas will be able to access affordable flood insurance from 2015.

F Ordinary Watercourse Enforcement Protocol

F.1 Introduction

Under the Land Drainage Act 1991 Thurrock Council Land Drainage Consents are required for the following activities on an ordinary watercourse.

Land Drainage Act Section 23 (and as amended by the FWMA 2010)

- The erection or alteration of any mill dam, weir or other obstruction to the flow of any watercourse
- The erection of any culvert
- The alteration of a culvert in a way that would be likely to affect flow

Consent is required regardless of whether work is permanent or temporary.

Ordinary watercourse **consent application forms and guidance** for completing the forms can be found on our website.

Under Section 24 of the Land Drainage Act Thurrock Council can serve a legal notice requiring a person to abate the nuisance, with regards to ordinary watercourses, within a specified time. Failure to conform by a notice can result in Thurrock Council carrying out the required remedial work and seek to recover associated costs.

F.2 Procedure for Written Consent Under Section 23 Land Drainage Act

The following approach will be adopted upon receipt of an application for consent to alter an ordinary watercourse by erecting or altering any mill, dam, weir or other structure, or to erect or alter a culvert.

1. Upon receipt of a correct application and fee, officers will consider if the proposed work is likely to affect the flow of an ordinary watercourse

   Officers will undertake a desk study to evaluate the ordinary watercourse and the proposed works

2. If the proposed work does not alter the flow of an ordinary watercourse then consent will not be required
3. If the proposed work does alter the flow of an ordinary watercourse then the officer will consider whether reasonable conditions can be imposed to prevent the alteration

   The officer will detail any conditions proposed and the reasons for them.

4. If the Officer is satisfied the conditions are appropriate and reasonable, the application will be granted subject to the conditions
5. If the Officer believes the works will alter the flow of an ordinary watercourse, and no conditions can be imposed to prevent alteration of the flow, then the application will be refused and recorded in the refusal letter along with the reasons for the rejection.

F.3 Procedure for Contraventions of Prohibitions on Obstructions under Section 24 of the Land Drainage Act

The following procedure will apply upon discovery of a nuisance caused by any obstruction erected, raised or altered, or any culvert erected or altered in contravention of Section 23.

1. Officers will visit the site to investigate and establish whether a nuisance has occurred. If the officer is unable to properly assess the situation without gaining entry onto private property, they are referred to the Powers of Entry Guidance.

   Officers will record the facts from their initial investigation.

   - If officers are able to ascertain that a nuisance has occurred they will record that fact.
   - If the officer deems there to be an imminent and serious risk of harm to a receptor then the officer should take reasonable action to minimise the risk
   - If the officer deems a nuisance to have occurred they will ascertain the identity of the person to whom they may consider issuing the notice. That person will be any of the following
     - Any person having control of the part of the watercourse where any impediment occurs
     - Any person owning or occupying the land adjoining the part of the watercourse where the impediment occurs
     - Any person whose act or default has impeded the condition of the watercourse
2. Once the relevant person has been identified, officers will record this fact alongside information on how they were identified
3. Following establishment of the identity of the land owner / controller, the officer will write to the riparian landowner to outline the reason for concern and to request a meeting to discuss the issue
   - If a meeting is agreed, a meeting will take place, giving officers a chance to explain how the breach may be

remedied and an action plan and associated timeframes agreed upon.

- If the riparian landowner fails to respond to the meeting request, a reminder will be sent. If they fail to cooperate then the officer will consider whether a formal notice should be served. The reason for any decision to enforce will be recorded. The notice will allow reasonable time in which the riparian landowner can remedy the breach.

4. If after the time specified, the work remains outstanding, the officer must prepare an updated report for consideration of either prosecution or for work to be carried out and the cost of the work recovered from the riparian landowner.
5. If it is decided to prosecute, the officer will forward the file to the legal department who will draft the document to be laid before the court.
    - Any person in contravention of, or failure to comply with, any notice served shall be guilty of an offence and liable on summary conviction to a fine. For every day after conviction, the riparian landowner will be liable to a daily fine.
6. If it is decided to undertake such as action that may be necessary to remedy the effect of the contravention or failure, the decision will be recorded
    - Before taking this action, officers will write to the riparian landowner informing them of the decision and detailing the likely work and associated costs that are likely to be incurred and recovered by the council should the work take place.
    - Officers will inform the riparian landowner to remedy the breach themselves, allowing a reasonable period of time to allow the riparian landowner to obtain alternative quotations for the work.
7. If the contravention or failure still exists after this period has elapsed, the officers may remedy the breach.
    - Once the breach is remedied, the Council may seek to recover the expenses incurred as a result of remedying the situation.

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G Sustainable Drainage Systems Guidance

G.1 Introduction

The use of Sustainable Drainage Systems to manage surface water run-off is an approach which seeks to mimic natural drainage systems. SuDS aim to retain water on or near the site as opposed to traditional drainage approaches which involve piping water off site as quickly as possible. SuDS provide opportunities to:

- reduce the causes and impacts of flooding;
- remove pollutants from urban run-off at source; and,
- combine water management with green space with benefits for amenity, recreation and wildlife.

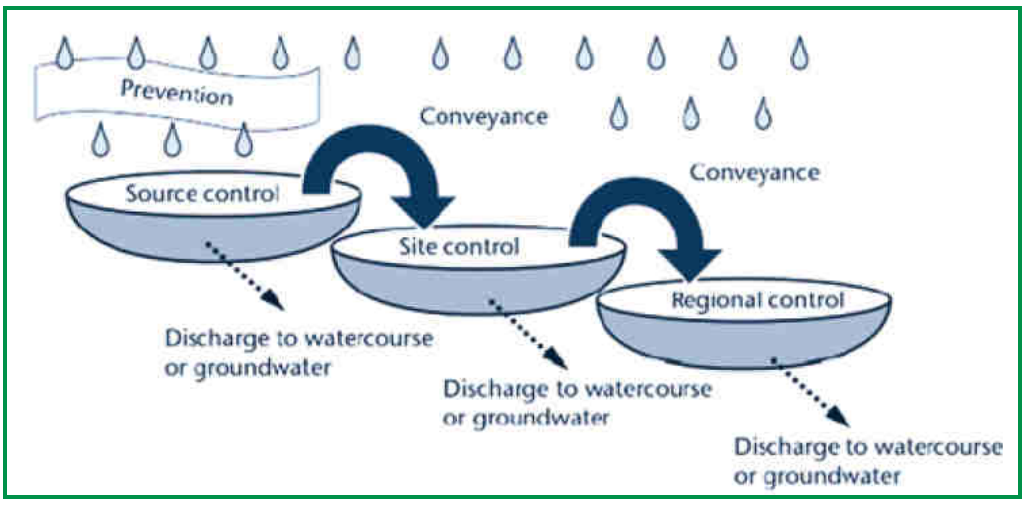
SuDS involve a range of techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands.

The variety of SuDS techniques available means that virtually any development should be able to include a scheme based around these principles. This should not be a piecemeal use of a few techniques. A fully integrated system is essential.

Some SuDS options could require significant land take so it is essential that they are considered early on in the design process. SuDS solutions are also available for high density urban environments where space is at a minimum. It can be difficult to incorporate some options once the detailed development design is underway.

Figure G-shows the SuDS management train which demonstrates managing water at source and provides a hierarchy of techniques for improving quality and quantity. Techniques closer to source are preferable.

Figure G-1 SuDS Management Train[3]



[3] Environment Agency, *Sustainable Drainage Systems (SUDS)*. [WWW] http://publications.environment-agency.gov.uk/pdf/GEHO0308BNST-e-e.pdf?lang=_e

Figure G- shows the SUDS hierarchy with the most sustainable solutions at the top of the table. These meet all 3 of the SUDS criteria.

Figure G-2 SuDS Hierarchy[4]

More sustainable

Least sustainable

SuDS technique	Flood reduction	Pollution reduction	Landscape & Wildlife benefit
Living roofs	✓	✓	✓
Basins and ponds - constructed wetlands - balancing ponds - detention basins - retention ponds	✓	✓	✓
Filter strips and swales	✓	✓	✓
Infiltration devices - soakaways - infiltration trenches and basins	✓	✓	✓
Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviors	✓	✓	
Tanked systems - over-sized pipes/tanks - storm cells	✓		

G.2 Surface water drainage guidance

G.2.1 *Why do I need to submit a surface water strategy?*

Government's expectation is that sustainable drainage systems will be provided in new developments wherever this is appropriate. According to the NPPF the expectation is that 'local planning policies and decisions on planning applications relating to major development - developments of 10 dwellings or more; or equivalent non-residential or mixed development (as set out in Article 2(1) of the Town and Country Planning (Development Management Procedure) (England) Order 2010)) to ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate[5],

In order to meet these new requirements developers must demonstrate that the proposals for the management of surface water satisfy minimum standards of operation according to Defra's Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems, and that there are clear arrangements in place for

[4] Source: Environment Agency Thames Region, 2006, *SUDS A Practical Guide*

[5] Written Statement made by: The Secretary of State for Communities and Local Government (Mr Eric Pickles) on 18 Dec 2014

ongoing maintenance over the lifetime of the development. The following sections outline the information that you are required to submit to Thurrock Council as part of your planning application in order for the Council to assess whether your design meets these requirements

G.2.2 *What information on surface water drainage needs to be provided with my application?*

The following checklists (Checklist A: Outline Application or Checklist B: Full Application/Discharge of Condition) outline the information that must be submitted for the Council to assess the suitability of the proposed surface water strategy.

For further information on how to complete your drainage design and a pro-forma to assist in the development of your application see the Sustainable Drainage section of the Council's website: www.thurrock.gov.uk/flood.

G.3 Further information

- **National Planning Policy Framework (NPPF)**
- **Defra's Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems** and
- CIRIA 523 (SUDS Best Practice Manual)
- CIRIA 609 (SUDS – hydraulic, structural and water quality advice)
- CIRIA 697 (SUDS Manual)
- CIRIA R156 (Infiltration Drainage – Manual of Good Practice)
- Sustainable Drainage Systems (SUDS) – Environment Agency (see **www.environment-agency.gov.uk/suds** for details)

Figure G-3 CHECKLIST A: Outline Application

Outline Drainage Design		
Ref.	**Information required**	**Supplied Y/N**
1.	Demonstrate an understanding of the natural drainage characteristics within and adjoining the site.	
2.	Provide an outline assessment of existing geology, ground conditions and permeability through desk-based research e.g. a review of geology maps and catchment information and site visit observations. Infiltration tests should be carried out at this stage wherever possible.	
3.	Prepare a Conceptual Drainage Plan to show: a) Development layout with indicative location of proposed attenuation storage b) Site discharge point	
4.	Provide a Conceptual SuDS Design Statement describing: c) The SuDS Design Criteria applicable to the site d) Indicative runoff rate calculations and attenuation volumes for the lifetime of the development e) Initial thoughts on how the site will be maintained f) Preferred point of connection. g) Proposed method of flow control h) Information regarding the proposed number of treatment stages to be applied to each element of the site i) Demonstration that surface water/groundwater entering the development from adjacent land has been taken into account.	

Figure G-4 CHECKLIST B: Full Application or Discharge of Drainage Conditions

Detailed Drainage Design		
Ref.	**Information required**	**Supplied Y/N**
1.	An assessment of suitability for infiltration based on soil types and geology, which should account for: j) The presence of constraints that must be considered prior to planning infiltration SuDS k) The drainage potential of the ground l) Potential for ground instability when water is infiltrated m) Potential for deterioration in groundwater quality as a result of infiltration n) Evidence of infiltration tests, particularly at the location of any intended infiltration device o) Groundwater level monitoring results	
2.	A Detailed Drainage Plan identifying: a) The proposed 'management train' and total land take b) Location and type of source control c) Site controls with storage locations d) Conveyance and exceedance flow routes e) The destination of runoff and any runoff rate restrictions	
3.	A Detailed SuDS Design Statement covering: a) Final SuDS to be incorporated and final discharge points where relevant b) Reason for changes to any previously submitted drainage scheme c) How the drainage design satisfies SuDS techniques in terms of water quality and attenuation and discharge quantity for the lifetime of the development d) Proposals, where relevant, for integrating the drainage system into the landscape or required publicly accessible open space and providing habitat and social enhancement e) Calculations showing the pre and post-development peak runoff flow rate for the critical rainfall event f) Provision of drainage for large storm events, including protection for SuDS systems g) Indication of overland flow routes and safeguarding of properties from flooding h) Any phasing plan for the development i) Management of health and safety risks j) The process for information delivery and community engagement to relevant stakeholders k) System valuation (including capital costs, operation and maintenance costs, cost contributions) and a demonstration of long term economic viability l) Preferred point of connection. m) Proposed method of flow control	

Detailed Drainage Design		
Ref.	**Information required**	**Supplied Y/N**
4.	Method Statement detailing how surface water runoff will be managed during construction phase.	
5.	Confirmation of land ownership of all land required for drainage and relevant permissions.	
6.	A SuDS Management Plan, which provides: a) Details of which body will be responsible for vesting and maintenance for individual aspects of the drainage proposals b) A management statement to outline the management goals for the site and required maintenance c) Description of maintenance schedule and materials and tools needed d) A maintenance schedule e) A site plan including access points, easements and outfalls.	
7.	Where required for major developments, a plan showing each development plot or phase (e.g. a development block of houses) which shows the allocation of volume storage and discharge rate given to that plot as part of a wider SuDS strategy.	

H LFRMS Programme and Strategic Investment Plan

The Strategy Programme and Funding Plan compiles all actions identified for the Borough over the Strategy period (6 years) and sits behind the LFRMS.

The annual Action Plans are prepared each year to outline the actions identified in the Strategy Programme and Funding Plan that are to be undertaken in that particular year.

H.1 LFRMS Funding and Programme scoring

There are two stages to the prioritisation of Actions

- Strategy period prioritisation; and
- Annual action prioritisation

Strategy period prioritisation

This first stage identifies which year of the Strategy period funding may be available. This will provide the initial Annual Action Plan

Annual action prioritisation

Once it has been identified what year of the Strategy period funding may be available, it is useful to prioritise those actions within the given year. To achieve this, the following scoring criteria have been developed:

H.2 Prioritisation scoring criteria

Q1: Is funding available from external partners?

If funding is available from external partners to support delivery it will increase the chances of an Action / Scheme receiving Grant in Aid (GiA) funding.

Answer	Score
Yes	1
No	0

Q2: Is the area known to have flooded in the past?

Areas that are known to have flooded in the past have been assigned a higher score to reflect the need to investigate and reduce flooding in areas known to be at risk.

Answer	Score
Yes	1
No	0

Q3: Approximately how many properties will benefit?

One way of assessing the benefits an Action / scheme may provide is to look at the number of properties that may benefit.

At this stage it is difficult to determine the exact number of properties that may benefit from an Action / scheme. To gain an approximate idea of the number of properties that may benefit, the number of properties at risk from surface water flooding in each Area of Critical Drainage (AoCD) has been used and refined where more information makes this possible. However, it is acknowledged that not all of these properties will no longer be at risk should a scheme be implemented. Where an Action is not limited to a specific AoCD, i.e. a borough-wide Action, it has been assigned the highest score.

Answer	Score
Less than 10	1
10 – 20	2
21 – 50	3
51 – 100	4
101 – 500	5
501 – 750	6
751 – 1,000	7
More than 1,001	8
Borough-wide benefit	9

Q4: Are there additional benefits?

Ideally Actions should provide multiple benefits, for example environmental benefits such as Water Framework Directive (WFD) benefits, or social benefits such as providing leisure and amenity or improving an area.

The more benefits that an Action / scheme can provide, the greater the likelihood of it receiving additional funding from outside sources.

Answer	Score
Yes	1
No	0

Q5: How many local objectives does the action meet?

It is important the Actions meet the objectives set out by the LFRMS. The more objectives that can be achieved through an Action, the higher the priority.

Answer	Score
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

Q6: What was the priority classification for the Action in the Surface Water Management Plan (SWMP)?

This allows the priority assigned to Actions carried over from the SWMP to be incorporated into the LFRMS.

Answer	Score
Low	1
Medium	2
High	3

H.3 Annual action plan prioritisation criteria

The scores from the questions set out in Section 2.2.1 are then compiled to give an overall score. The overall score is then used to assign a priority to the Actions in the Annual Action Plan.

Annual Action Plan Priority	Score
Low	Less than 5
Medium	6 – 10
High	11 – 20
Very High	Greater than 21

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Actions						OBJECTIVES												Action Owners/Partners			Other stakeholders	Strategy Priority
						National Objectives					Local Objectives											
ID	What?	How?	Ward	Area of Critical Drainage	Action Type	N1	N2	N3	N4	N5	L1	L2	L3	L4	L5	L6	L7	L8	Lead Organisation	LLFA Dept	Support		
1	Raise awareness of AoCD amongst Planners and influence planning policies to prevent the creation of new risk areas	Include Planners and planning policy influencers in awareness raising activities Ensure AoCD information is clear and accessible	ALL	ALL	Communication / Partnerships	✓	✓				✓				✓				Thurrock Council	Spatial Planning	Thurrock Flood Partnership	EA, Anglian Water	**High**
7	Improved maintenance of drainage network	Information from the asset surveys and register should be used to create a maintenance regime that prioritises key assets and drainage areas within budgets available	ALL	ALL	Investigation / feasibility / design			✓			✓		✓						Thurrock Council	Flood Risk Mgr / Highways / Transportation	Anglian Water, Highways Agency		**High**
9	Implement a standardised flood incident log	Revise the incident log as required to incorporate more information. Develop a GIS/web-based database to create a spatial representation of the incidents logged	ALL	ALL	FWMA / Flood Risk Regs	✓				✓		✓			✓	✓			Thurrock Council	Flood Risk Mgr			**High**
21	Improvements to drainage infrastructure: Purfleet Industrial Park / Milehams Yard	Commission drainage studies to confirm where there are alterations in ground levels which may be causing the local gravity system to fail. Results to be used to confirm a way forward e.g. maintenance of existing system or installation of a new drainage network.	Aveley & Uplands	AoCD001	Investigation / feasibility / design	✓					✓	✓	✓					✓	Thurrock Council	Flood Risk Mgr	Highways	EA, Anglian Water	**High**
42	Asset survey of surface water ditch: AoCD010	Surface water ditch in the south eastern corner of East Tilbury contains all of the town's surface water drainage; ownership and maintenance responsibilities are unknown. If ownership cannot be confirms, Thurrock Council to consider adopting this network	East Tilbury	AoCD009	Policy	✓		✓			✓	✓	✓						Thurrock Council	Flood Risk Mgr	Anglian Water	Developers	**Medium**
45	Asset survey and maintenance responsibilities: Prospect and Valmar Avenues	Liaise and educate residents of Prospect and Valmar Avenue regarding their riparian responsibilites regarding the culvert/ditch to the rear of their properties	Stanford-le-Hope West	AoCD010b	Communication / Partnerships	✓		✓	✓		✓		✓		✓				Thurrock Council	Flood Risk Mgr	Environment Agency	EA / Defra / local lanowners	**Medium**
46	Improvements to drainage infrstructure: Runnymeade Road recreation ground	Identify recreation ground as a surface water flood storage area in asset register. Complete condition survey of the outfall from the recreation ground and confirm how it reconnects to the Stanford Brook. Undertake any required remedial action.	Stanford-le-Hope West	AoCD010b	Investigation / feasibility / design			✓			✓	✓	✓					✓	Thurrock Council	Flood Risk Mgr	Environment Agency	Local landowners	**High**
47	Asset register: open land in Stanford-le-Hope	Open land in Stanford-le-Hope and Runnymeade recreation ground act as flood storage areas; these should be identified as such in the asset register and highlighted to development control teams. Any development in these areas would require level for level floodplain compensation.	Stanford-le-Hope West Orsett	AoCD010b	Communication / Partnerships		✓	✓			✓		✓						Thurrock Council	Flood Risk Mgr	Environment Agency	Local landowners	**Medium**

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Thurrock Local Flood Risk Management Strategy – Strategic Environmental Assessment

Screening Report

December 2014

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v1.0 / December 2014		Thurrock Council

Contract

This report describes work commissioned by Thurrock Council. David Revill of JBA Consulting carried out this work.

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Contents

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Abbreviations

EC	European Community
EQS	Environmental Quality Standards
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
ODPM	Office of the Deputy Prime Minister
SEA	Strategic Environmental Assessment

1 Introduction

The primary aim of this screening report is to identify whether or not the preparation of the Thurrock Local Flood Risk Management Strategy (LFRMS) requires a Strategic Environmental Assessment (SEA). This screening report provides the initial statement on the potential high-level environmental impacts that may arise from the LFRMS. The legislative regime driving the SEA process is also described, with the relevant specific regulations identified and the subsequent responses that the SEA will provide. Sections 3 and 4 provide the screening assessment of the potential significant environmental effects resulting from the LFRMS and ultimately whether there exists a requirement for a full SEA. Section 5 confirms the conclusion of the screening process.

2 Legislative Regime

The Environmental Assessment of Plans and Programmes Regulations 2004, or SEA Regulations, transpose in to English Law the European Directive 2001/42/EC (the SEA Directive). These regulations form the basis by which all SEAs are carried out to assess the effects and impacts of certain plans and programmes on the environment.

Detailed practical guidance on these regulations can be found in the Office of the Deputy Prime Minister (ODPM) Government publication, *A Practical Guide to the Strategic Environmental Assessment Directive* (ODPM, 2005). This document has been used as the basis of this screening report, in conjunction with the SEA Regulations.

3 Assessment Criteria

Article 3 of the SEA Directive describes and sets out the scope of application of the directive and makes SEA mandatory for plans or programmes that are likely to have significant effects on sites designated under the European Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive), i.e. Special Areas of Conservation and Special Protection Areas.

The methodology for determination, i.e. the screening, is specified within paragraph 5. Paragraph 5 of Article 3 of the Directive requires that the full criteria identified in Annex II are taken into account when considering the environmental effects of the LFRMS and their significance. The implication from the text of Article 3 paragraph 5 and Annex II is that the whole set of Annex II criteria needs to be considered, but only the relevant criteria applied to the assessment.

The criteria for determining the likely significance of effects referred to in Article 3 Paragraph 5 of Directive 2001/42/EC, and laid in Annex II, are set out below:

- The characteristics of plans or programmes, having regard, in particular, to:-
  - The degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size, and operating conditions or by allocating resources.
  - The degree to which the plan or programme influences other plans or programmes including those in a hierarchy.
  - The relevance of the plan or programme for the integration of environmental considerations, in particular with a view to promoting sustainable development.
  - Environmental problems relevant to the plan or programme.
  - The relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste management or water protection).
- The characteristics of the effects and of the area likely to be affected, having regard, in particular to:-
  - The probability, duration, frequency and reversibility of the effects.
  - The cumulative nature of the effects.
  - The transboundary nature of the effects.

- The risks to human health or the environment (e.g. due to accidents).
- The magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected).
- The value and vulnerability of the area likely to be affected due to :-
  - Special natural characteristics or cultural heritage.
  - Exceeded environmental quality standards or limit values.
  - Intensive Land-use.
- The effects on areas or landscapes which have a recognised National, Community or International protection status.

These criteria and characteristics are developed further in the following section and are presented with reason and comment in the context of the Thurrock LFRMS.

4 Assessment Screening Process

The following section is based on the flowchart presented in Figure 2 of *A Practical Guide to the Strategic Environmental Assessment Directives*, which is reproduced in Figure 4-1 below. This details the application of the SEA Directive to plans and programmes, and illustrates the screening process. Table 4-1 below provides responses to the questions from Figure 2 and therefore also details the conclusion of the screening process.

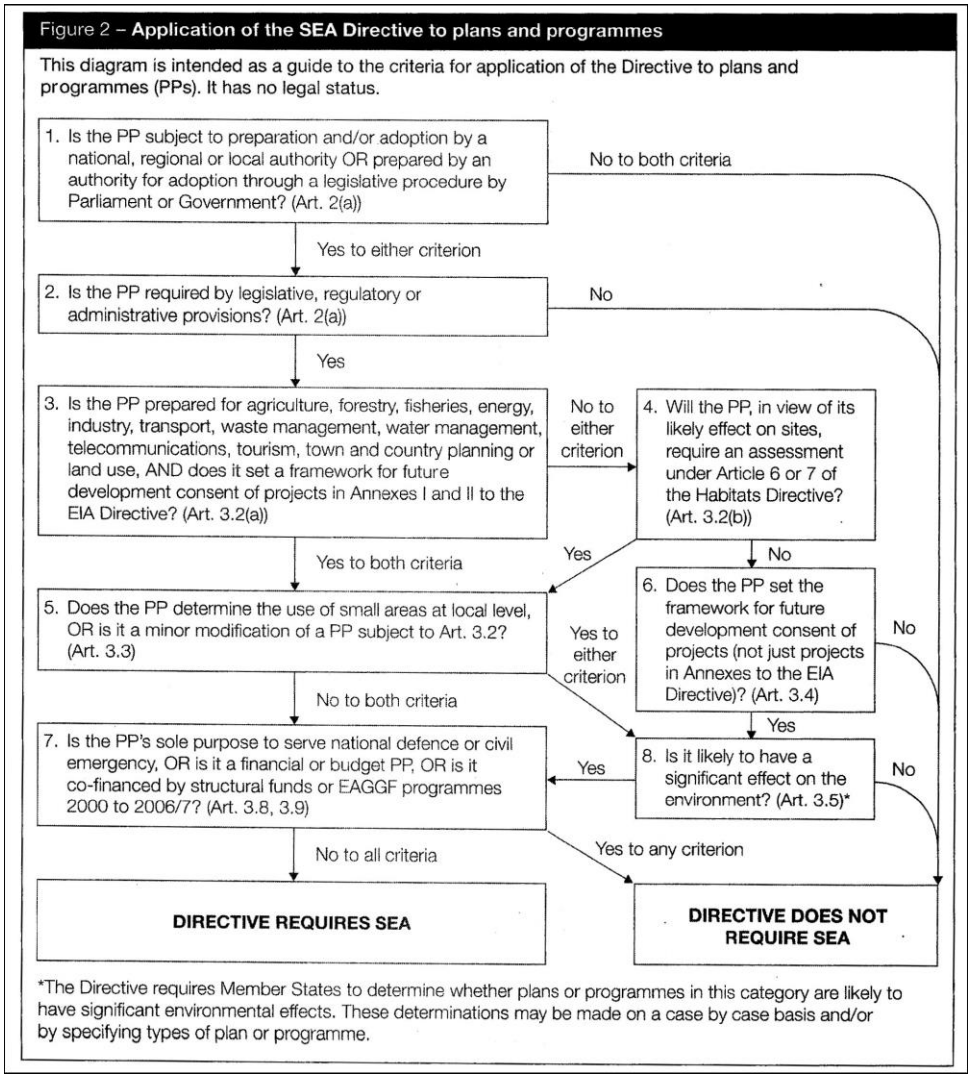

Figure 4-1: Application of the SEA Directive to Plans and Programmes (source: *A Practical Guide to the Strategic Environmental Assessment Directives)*

Table 4-1: SEA Screening Process

Stage & Question	Answer	Explanation
1. Is the plan or programme (PP) subject to preparation and/or adoption by a national, regional or local authority OR prepared by an authority for adoption through a legislative procedure by Parliament or Government? (Art. 2(a))	Yes	Thurrock Council is responsible for production of the LFRMS, as Lead Local Flood Authority (LLFA)
2. Is the PP required by legislative, regulatory or administrative provisions? (Art. 2(a))	Yes	The Flood and Water Management Act 2010 requires a LLFA to develop, maintain, apply and monitor a LFRMS for its area.
3. Is the PP prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use AND does it set a framework for future development consent of projects in Annexes I and II to the EIA Directive? (Art. 3.2(a))	Yes Yes	The LFRMS is prepared for water management. The LFRMS sets a framework for future development consent of projects in Annexes I and II
4. Will the PP, in view of its likely effect on sites, require an assessment under Article 6 or 7 of the Habitats Directive? (Art. 3.2(b))	-	Not answered because both criterion for Q3 answered 'Yes'
5. Does the PP determine the use of small areas at local level OR Is it a minor modification of a PP subject to Art. 3.2? (Art. 3.3)	No No	
6. Does the PP set the framework for future development consent of projects (not just projects in Annexes to the EIA Directive)? (Art 3.4)	-	Not answered because both criterion for Q5 answered 'No'
7. Is the PP's sole purpose to serve national defence or civil emergency, OR Is it a financial or budget PP OR Is it co-financed by structural funds or EAGGF programmes 2000 to 2006/7? (Art. 3.8, 3.9)	No No No	

Table 4-2 below gives initial comment regarding the likely significance of the various effects considered to arise from the LFRMS.

Table 4-2: Initial Assessment of Effect Significance

Criteria for determining the likely significance of effects (Article 3(5) of Directive 2001/42/EC)	Comment
The characteristics of plans or programmes having regard, in particular, to:	
The degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size, and operating conditions or by allocating resources.	The LFRMS will set a framework for any flood risk management projects and activities deemed necessary to manage flood risk within Thurrock. The location, nature, size, operating conditions and allocated resources of these will depend on the level of flood risk but the environmental implications of will be considered during the integrated strategy development process.
The degree to which the plan or programme influences other plans or programmes including those in a hierarchy.	The LFRMS will support existing policies, as well as influencing and being influenced by emerging policies.
The relevance of the plan or programme for the integration of environmental considerations, in particular with a view to promoting sustainable development	By integrating the SEA process with the LFRMS strategy development process, environmental considerations will be integral, maximising the potential to promote sustainable development. Contributing to achieving sustainable development is a stated aim of the Flood and Water Management Act 2010.
Environmental problems relevant to the plan or programme.	The LFRMS may include objectives or measures that influence existing environmental issues in the plan area.
The relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste management or water protection).	The LFRMS will contribute to Water Framework Directive objectives.
The characteristics of the effects and of the area likely to be affected, having regard, in particular to:	
The probability, duration, frequency and reversibility of the effects.	The LFRMS may provide both short term and long term effects for water management. There is potential for permanent effects as a result. Environmental effects will be assessed as part of the SEA, with adverse effects mitigated or avoided.
The cumulative nature of the effects.	There is potential for the LFRMS to have cumulative effects both spatially and temporally. This will be fully assessed as part of the SEA, with all other relevant plans, projects and policies considered.
The transboundary nature of the effects.	Catchments cross district/county boundaries and there is therefore potential for the LFRMS to lead to effects outside of Thurrock. There are no international boundaries of relevance to the LFRMS.
The risks to human health or the environment (e.g. due to accidents).	The LFRMS aims to control the risks associated with flooding. The SEA will make full consideration of the potential effects of any measures resulting from the LFRMS.
The magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected).	The LFRMS must address the issues associated with flooding for the whole district of Thurrock. As indicated above, cumulative and transboundary issues will also be considered.
The value and vulnerability of the area likely to be affected due to :- ▪ Special natural characteristics or cultural heritage ▪ Exceeded environmental quality standards (EQS) or limit values ▪ Intensive Land-use	Significant natural and cultural features may be at risk of flooding. The potential effects of the LFRMS on these will be assessed in an integrated fashion through the SEA. Flooding can cause EQS and other related values to be exceeded; the LFRMS aims to reduce the occurrence and impacts of such events. The LFRMS and SEA will fully consider land use, including intensity in its various forms.
The effects on areas or landscapes which have a recognised National, Community or International protection status.	Consideration of potential impacts on such sites will be a key aspect of the integrated approach to the LFRMS and SEA processes.

5 Conclusion

Preparation of the LFRMS is the responsibility of Thurrock Council. It is required by the Flood and Water Management Act 2010 and is for water management. In addition, it is considered that the LFRMS will potentially give rise to significant environmental effects.

In conclusion, it is therefore considered that the Thurrock LFRMS requires a Strategic Environmental Assessment.

6 Consultation

Thurrock Council is required to consult with the three statutory environmental consultees: English Heritage, the Environment Agency and Natural England. The bodies will be consulted for their opinions and comments on the conclusion outlined above, with any comments incorporated into subsequent stages of the SEA. In addition, the information will be made available to the public through Thurrock Council's website and the Council offices.

References

ODPM, 2005. *A Practical Guide to the Strategic Environmental Assessment Directive*. Office of the Deputy Prime Minister.

Available online: http://www.communities.gov.uk/documents/planningandbuilding/pdf/practicalguidesea.pdf [last accessed 5th September 2013

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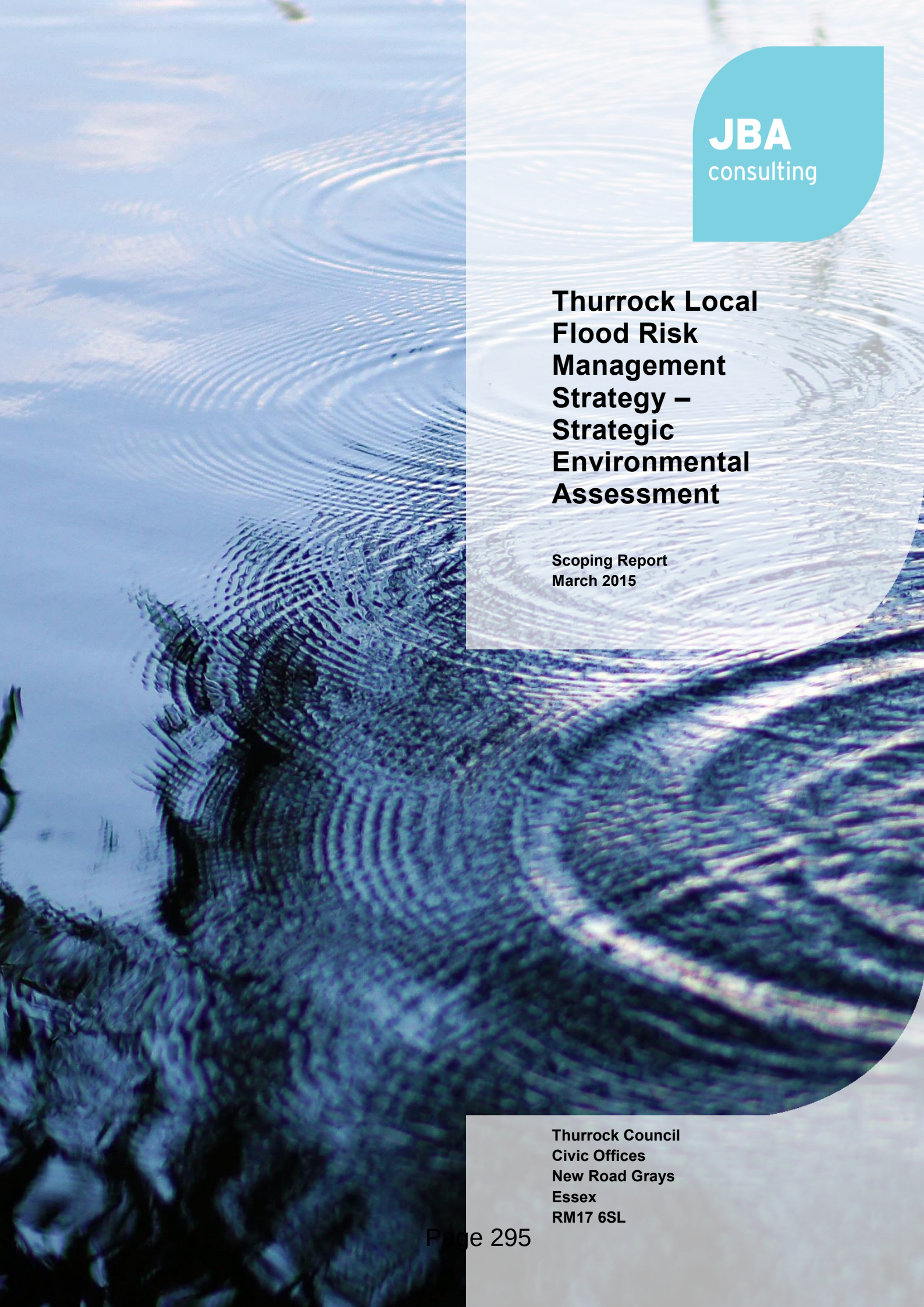

Thurrock Local Flood Risk Management Strategy – Strategic Environmental Assessment

Scoping Report
March 2015

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Abbreviations

AOD ..... Above Ordnance Datum
AONB ..... Area of Outstanding Natural Beauty
AQMA ..... Air Quality Management Area
BAP ..... Biodiversity Action Plan
CAMS ..... Catchment Abstraction Management Strategy
FWMA ..... Flood and Water Management Act
GEP ..... Good Ecological Potential
HAP ..... Habitat Action Plan
HMWB ..... Heavily Modified Water Body
HRA ..... Habitats Regulations Assessment
IMD ..... Index of Multiple Deprivation
JNCC ..... Joint Nature Conservation Committee
LFRMS ..... Local Flood Risk Management Strategy
LGA ..... Local Government Association
LLFA ..... Lead Local Flood Authority
LNR ..... Local Nature Reserve
LWS ..... Local Wildlife Site
NCA ..... National Character Area
NERC ..... Natural Environment and Rural Communities Act (2006)
NIA ..... Nature Improvement Area
NNR ..... National Nature Reserve
NVZ ..... Nitrate Vulnerable Zone
ODPM ..... Office of the Deputy Prime Minister
RBMP ..... River Basin Management Plan
RMA ..... Risk Management Authority
rMCZ ..... Recommended Marine Conservation Zone
SAC ..... Special Area of Conservation
SAP ..... Species Action Plan
SEA ..... Strategic Environmental Assessment
SLA ..... Special Landscape Area
SPA ..... Special Protection Area
SPZ ..... Source Protection Zone
SSSI ..... Site of Special Scientific Interest
SuDS ..... Sustainable Drainage Systems
UKCP09 ..... UK Climate Projection
WFD ..... Water Framework Directive
WRMU ..... Water Resource Management Units

1 Introduction

Thurrock Council is currently preparing a Local Flood Risk Management Strategy (LFRMS). As part of this process, the Council is also carrying out a Strategic Environmental Assessment (SEA), which considers the potential environmental impacts of the LFRMS. This Scoping Report sets out the scope of, and assessment framework for undertaking, the SEA. It provides a description of the baseline environmental characteristics and key environmental issues in and around Thurrock, and identifies other relevant plans, programmes and policies that may influence the development of the LFRMS. This report also sets out a framework to be used to examine the environmental impacts of implementing the LFRMS and comprises a series of SEA objectives and indicators that have been developed to reflect the key environmental issues of relevance to Thurrock.

1.1 The Local Flood Risk Management Strategy

The Flood and Water Management Act (FWMA) was passed in April 2010. It aims to improve both flood risk management and the way we manage our water resources. The FWMA creates clearer roles and responsibilities and instils a more risk-based approach to flood risk management. This includes a new lead role for the Council as a Lead Local Flood Authority (LLFA) in managing and leading on local flood risk management from surface water, groundwater and ordinary watercourses.

Under the requirements of the FWMA, the Council must develop, maintain, apply and monitor a LFRMS for its area. The LFRMS provides a delivery vehicle for improved flood risk management and supports the development of partnership funding and strategic investment programme.

The LFRMS will set out:

- The roles and responsibilities for each Risk Management Authority (RMA) and their flood risk management functions; and
- Opportunities, objectives and measures for flood risk reduction of existing communities, including ways to minimise the risk from future growth.

Development of the LFRMS provides considerable opportunities to improve and integrate land use planning and flood risk management. It is an important tool to protect vulnerable communities and deliver sustainable regeneration and growth.

1.2 Strategic Environmental Assessment (SEA)

A SEA is a statutory assessment process required under the Environmental Assessment of Plans and Programmes Regulations 2004 (the 'SEA Regulations'). These regulations transpose into United Kingdom (UK) law the requirements of the European Directive 2001/42/EC *on the assessment of the effects of certain plans and programmes on the environment* (the 'SEA Directive')[1]. The SEA Directive requires formal assessment of plans and programmes which are likely to have significant effects (either positive or negative) on the environment. It applies to all plans and programmes which are *'subject to preparation and/or adoption by an authority at national, regional or local level'* or are *'required by legislative, regulatory or administrative provisions'* (ODPM, 2004).

Local Government Association (LGA) guidance (LGA, 2011) on the production of the LFRMS identifies the likely requirement for an SEA, stating that *'the Local FRM Strategy is likely to require statutory SEA, but this requirement is something the LLFA must consider'*. A SEA screening process was therefore undertaken and the Council has confirmed the requirement for its LFRMS to undergo SEA.

The first output from the SEA process is the production of a Scoping Report, which outlines the scope and methodology of the assessment. A proportionate approach has been adopted towards establishing the scope of the SEA, reflecting the high-level nature of the LFRMS. Consultation with the statutory consultees (English Heritage, Natural England and the Environment Agency) will be undertaken to refine and confirm the methodology and scope of the assessment. These

[1] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

aspects will be reviewed iteratively as the LFRMS develops so as to ensure the strategy fully considers the environmental impacts of its implementation before it is adopted.

Once consultation on the scope of the SEA has been completed, an Environmental Report will be prepared that assesses and describes the likely significant impacts on the environment of implementing the LFRMS.

1.3 Study area

Thurrock is a unitary authority with borough status located in the county of Essex in east England, 32km east of central London (Figure 1-1). The borough is part of the London commuter belt and within the Thames Gateway redevelopment zone. The borough covers an area of approximately 163km^2 and has a population of approximately 157,750 people (2011) (Thurrock Council, 2014). Thurrock is generally low lying and bounded to the south by the Thames Estuary and bordered to the north by the boroughs of Castle Point, Basildon and Brentwood.

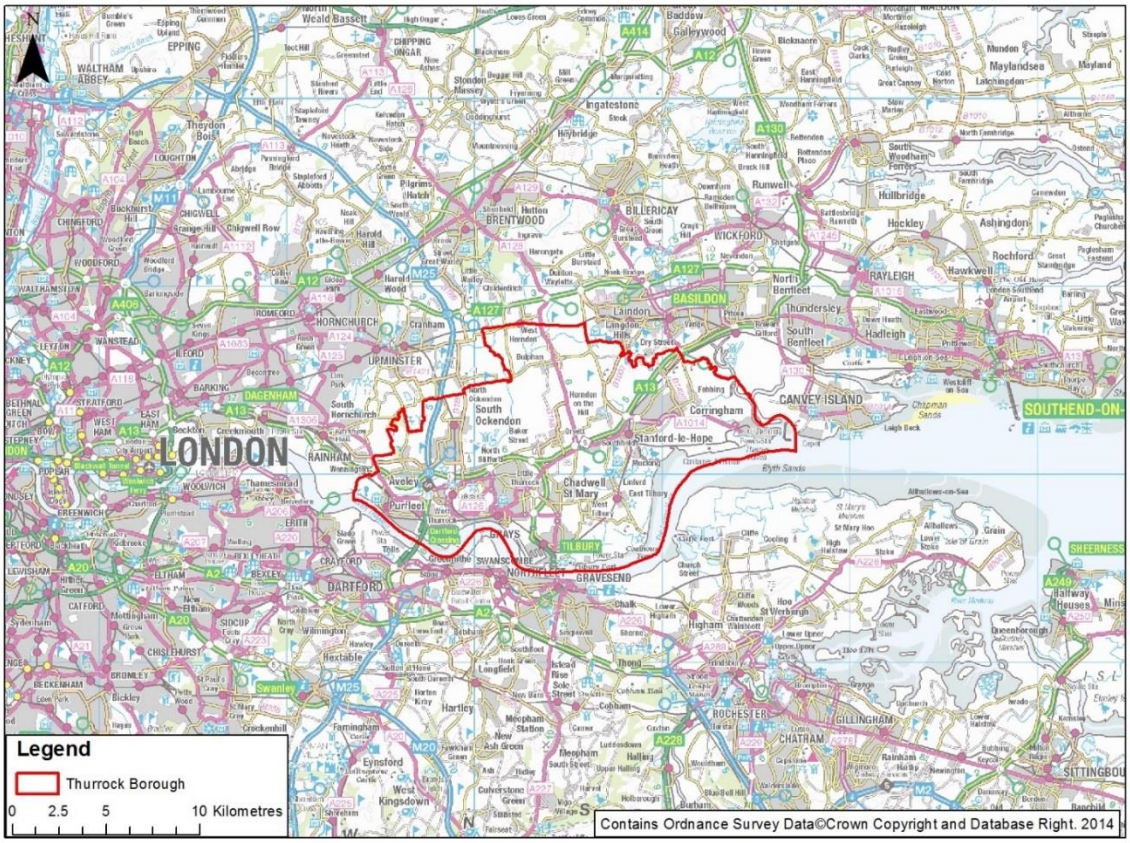

Figure 1-1: Study area

2 SEA process and methodology

2.1 Meeting the requirements of the SEA Directive

SEA involves the systematic identification and evaluation of the potential environmental impacts of the LFRMS. This information is then used to aid the selection of a preferred option(s) for the strategy, which are those that best meet its economic, environmental and social objectives, and legal requirements.

The full range of environmental receptors has been considered when developing the scope of the SEA. This meets the requirements of the SEA Directive, which requires that an assessment identifies the potentially significant environmental impacts on *'biodiversity, population, human health, fauna, flora, soil, water, air, climatic, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors'*[1].

Annex I of the SEA Directive sets out the scope of information to be provided by the SEA. This is described in Table 2-1 below, which also identifies where in the SEA process for the LFRMS that the relevant requirement will be met.

Table 2-1: Stages in the SEA process as identified within Annex I of the SEA Directive

SEA Directive requirements	Where covered in the SEA
(a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;	SEA Scoping Report (Section 3)
(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	SEA Scoping Report (Section 4)
(c) the environmental characteristics of areas likely to be significantly affected;	SEA Scoping Report (Section 4)
(d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	SEA Scoping Report (Section 4)
(e) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	SEA Scoping Report (Sections 3 and 4)
(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;	SEA Environmental Report (to be prepared)
(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	SEA Environmental Report (to be prepared)
(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	SEA Environmental Report (to be prepared)
(i) a description of the measures envisaged concerning monitoring in accordance with Article 10;	SEA Environmental Report (to be prepared)
(j) a non-technical summary of the information provided under the above headings.	SEA Environmental Report (to be prepared)

2.2 Stages in the SEA process

This report has been prepared in accordance with the requirements of the SEA Regulations and follows good practice guidance produced by the Office of the Deputy Prime Minister (OPDM) (ODPM, 2005). The ODPM guidance sets out a five stage process (A to E) to be followed (see Table 2-2). This Scoping Report addresses Stage A of the process wherein the context and objectives of the SEA are identified and the scope of the assessment is determined. For the purpose of this assessment, stages A1 to A4 will be completed, whilst stage A5 comprises

consultation on this Scoping Report, which will be conducted as outlined in Section 6 of this document.

Table 2-2: Stages in the SEA process

SEA stages and tasks	Purpose	Where covered in the SEA
Stage A	**Setting the context and objectives, establishing the baseline and deciding on the scope**	SEA Scoping Report
(A1) Identifying other relevant plans, programmes and environmental protection objectives	To establish how the plan or programme is affected by outside factors, to suggest ideas for how any constraints can be addressed and to help to identify SEA objectives.	SEA Scoping Report (Section 3)
(A2) Collecting baseline information	To provide an evidence base for environmental problems, prediction of effects, and monitoring; to help in the development of SEA objectives.	SEA Scoping Report (Section 4)
(A3) Identifying potential environmental problems	To help focus the SEA and streamline the subsequent problems, prediction of effects, and monitoring; to help in the development of SEA objectives.	SEA Scoping Report (Section 4)
(A4) Developing SEA objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed.	SEA Scoping Report (Section 5)
(A5) Consulting on the scope of SEA	To ensure that the SEA covers the likely significant environmental effects of the plan or programme.	SEA Scoping Report (Section 6)
Stage B	**Developing and refining options and assessing effects**	SEA Environmental Report (to be prepared)
Stage C	**Preparing the Environmental Report**	SEA Environmental Report (to be prepared)
Stage D	**Consulting on the draft LFRMS and the Environmental Report**	SEA Environmental Report (to be prepared)
Stage E	**Monitoring the significant effects of implementing the LFRMS**	SEA Environmental Report (to be prepared)

2.3 Scope of the SEA

2.3.1 Task A1: Identifying other relevant policies, plans and programmes, and environmental protection objectives

The relationship between various policies, plans, programmes and environmental protection objectives may influence the LFRMS. The relationships are analysed to:

- Identify any external social, environmental or economic objectives that should be reflected in the SEA process;
- Identify external factors that may have influenced the preparation of the plan; and
- Determine whether the policies in other plans and programmes might lead to cumulative or synergistic effects when combined with policies in the plan.

The plans and programmes that need to be considered include those at the international, national, regional and local scale. These are identified and evaluated in Section 3.

2.3.2 Task A2: Collecting baseline information

The SEA Directive identifies a range of environmental topics that must be considered for all environmental assessments. These are shown in Table 2-3.

Baseline information has been collected in relation to each of these topics, many of which are inter-linked. A desk study was undertaken to identify baseline environmental information, which was used to determine the key environmental characteristics of the LFRMS area. This information provides the basis for assessing the potential effects of the LFRMS options and will aid development of appropriate mitigation measures, together with a future monitoring

programme. The information search included information from a wide range of sources including the following organisations:

- Thurrock Council
- Natural England
- Environment Agency
- Office for National Statistics
- English Heritage
- Joint Nature Conservation Committee (JNCC)

Where information is available, key environmental targets and objectives have been identified; established and predicted trends in the status or condition of environmental features have been described; and significant environmental and sustainability issues have been highlighted. Trends evident in the baseline information have been used to predict the future baseline situation, which has assumed a continuation of the existing trends in some cases.

Table 2-3: Environmental topics to be covered in the SEA

SEA Directive requirements	Where covered in the Scoping Report	Definition in relation to this report
Air	Air quality	Air quality patterns.
Biodiversity (including flora and fauna)	Biodiversity, flora and fauna	Rare and notable species and habitats; trends in condition and status.
Climate	Climate	Regional climate patters; trends in greenhouse gas emissions and the sources of these emissions; mitigation measures and adaptation options to manage climate change.
Cultural heritage	Historic environment	Protected and notable heritage features; human induced physical changes to the environment.
Human health	Population	Trends and patterns in human health; key community facilities and recreation opportunities.
Landscape	Landscape and visual amenity	The local landscape character; protected and notable landscapes; key local landscape features.
Material assets	Material assets	Critical infrastructure.
Population	Population	Where people live and work; population trends and demographics; economic prosperity; relative levels of advantage, disadvantage and inequality; key community facilities; accessibility and recreation opportunities.
Soil	Geology and soils	Variety of rocks, minerals and landforms; the quantity and distribution of high quality soil.
Water	Water environment	Chemical and biological water quality; water resources; water body hydromorphology; flood risk.
The interrelationship between the above factors	Throughout the Scoping Report	The relationship between environmental features and issues.

2.3.3 Task A3: Identifying environmental issues and problems

The identification of significant environmental issues is an important step in establishing an appropriate assessment framework. Such issues have been identified directly through the baseline information search or can be identified by evaluating the relationship between the aims of the LFRMS and the established environmental baseline.

2.3.4 Task A4: Developing the SEA objectives

SEA objectives are a key tool used to assess the potential positive and negative environmental effects of the LFRMS. Together with associated indicators, they form an assessment framework that provides a means to predict, describe and analyse the environmental effects that are likely to arise from the implementation of the strategy. The strategy objectives are appraised

individually against each SEA objective, thereby allowing environmental, economic and social effects, in particular those which are significant, to be identified. The use of comparable alternatives can also be incorporated into the assessment once the assessment framework has been established to aid in the identification of the most appropriate option for each of the strategy objectives.

2.4 Habitats Regulations

The European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC, 'the Habitats Directive'), as implemented through the Conservation of Habitats and Species Regulation 2010 (as amended) ('the Habitats Regulations'), requires a competent authority to carry out a Habitats Regulations Assessment (HRA) of a plan or project to establish whether it will have a 'likely significant effect' on sites designated for their nature conservation interest at an international level (known as European sites, which include Special Areas of Conservation (SAC), Special Protection Areas (SPA), and by UK Government policy, Ramsar sites). The LFRMS for Thurrock borough, as a statutory plan, is subject to the requirements of the Habitats Directive.

Assessing the impacts of a plan under the Habitats Regulations is a separate process to SEA. However, there is overlap between these two types of assessment. A Test of Likely Significant Effect (Screening Assessment) has been undertaken in accordance with the requirements of the Habitats Regulations to determine whether the LFRMS is likely to adversely affect the integrity of a European site (alone or in combination). If a likely significant adverse effect is identified, an Appropriate Assessment must be carried out to assess the potential impacts and determine whether it is possible to demonstrate that there would not be an adverse effect on the integrity of the European site.

A Screening Assessment will be undertaken Stage B (Table 2-2). More details of European sites in and around Thurrock is provided in Section 4.12. Consultation with Natural England on the outcomes of this assessment will be undertaken as part of the consultation process outlined in Section 6.

3 Other relevant policies, plans and programmes

3.1 Introduction

An important aspect of the SEA process is the assessment of other policies, plans and programmes and their environmental protection objectives, to identify how these strategic objectives may influence the development of the LFRMS. Identifying these relationships enables potential synergies to be determined, strengthening the benefits that can be gained from implementation of the LFRMS. This information is also used to inform the development of the environmental baseline and the identification of key issues and problems. In addition, any inconsistencies or constraints can be identified, which could hinder the achievement of the environmental protection objectives or those of the LFRMS, and therefore providing a broad appraisal of the strategy's compliance with international, national and local considerations.

The ODPM SEA guidance recognises that no list of plans or programmes can be definitive and as a result this report describes only the key documents that may influence the LFRMS. These are shown in Table 3-1.

Table 3-1: Policies, plans and programmes reviewed through this SEA process

Plan, Policy or Programme
International
EU Sustainable Development Strategy (revised 2006)
European Biodiversity Strategy to 2020
EC Birds Directive – Council Directive 2009/147/EEC on the conservation of wild birds
EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks
EU Groundwater Directive – Directive 2006/118/EC on the protection of groundwater against pollution and deterioration
EC Habitats Directive – Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
Urban Wastewater Treatment Directive – Directive 91/271/EEC concerning urban waste water treatment
EU Water Framework Directive – Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy
National
Securing the Future – the UK Government Sustainable Development Strategy (2005)
Flood and Water Management Act (2010)
Flood Risk Regulations (2009)
Water for People and the Environment, Water Resources Strategy for England and Wales (2009)
Future Water, The Government's water strategy for England (2008)
Making Space for Water – taking forward a new Government strategy for flood and coastal erosion risk management in England (2005)
The National Flood and Coastal Erosion Risk Management Strategy for England (2011)
Water Act (2003)
Draft Water Bill (2012)
The National Flood Emergency Framework for England (2011)
The Carbon Plan (2011)
Building a Low Carbon Economy – the UK's Contribution to Tackling Climate Change (2008)
Climate Change Act (2008)
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystems (2011)
England Biodiversity Framework (2008)
UK Biodiversity Action Plan (1994)
National Wetland Vision (2008)
Wildlife and Countryside Act (as amended) (1981)
Natural Environment and Rural Communities (NERC) Act (2006)
Salmon and Freshwater Fisheries Act (1975)
Contaminated Land (England) Regulations (2006)
National Planning Policy Framework (2012)
PPS5: Planning for the Historic Environment Practice Guide (2010)
Historic Environment Good Practice Advice in Planning: Historic Environment Records (2014)

Plan, Policy or Programme
Historic Environment Good Practice Advice Guide in Planning: Note 3: The Setting of Heritage Assets.
Regional / Local
Thames Catchment Flood Management Plan (2009)
Thames Estuary 2100 Strategy (2002)
Thames Gateway Delivery Plan (2009)
Managing Water Resources & Flood Risk in the South East (2005)
London Rivers Action Plan (2009)
Thames River Basin Management Plan
Thurrock Council Local Air Quality Action Plan (2004)
Thurrock Environmental Vision and Policy (2013)
Essex County Council Preliminary Flood Risk Assessment (2011)
Thurrock Strategic Flood Risk Assessment Level 1 Report (2009) and Level 2 Report (2010)
Thurrock Transport Strategy 2013-2026 (2013)
Thurrock Local Development Framework Core Strategy and Policies for Management of Development (2011)
Sustainable Community Strategy Thurrock 2020 (2009)
Essex Biodiversity Action Plan (2011)
Thurrock Biodiversity Action Plan 2007-2012
Essex County Council Adapting for Climate Change – Action Plan (2014)
Open Spaces Strategy 2006 – 2011 (2006)
Riverscapes – An environmental vision for Thurrock 2013-2023 (2013)

3.2 Summary of the review

The key themes identified by this review are shown in Table 3-2. A summary of the policy documents and their relevance to the Thurrock LFRMS is set out in Appendix A.

Table 3-2: Key themes

SEA topic	Key themes
Landscape and visual amenity	Protecting sensitive landscape assets (including Special Landscape Areas (SLA) and Areas of Outstanding Natural Beauty (AONB)); promoting the conservation and enhancement of natural beauty and amenity of important landscapes, including inland waters; definition and protection of regional and local landscape character; and the provision and enhancement of green infrastructure to benefit people and the environment.
Biodiversity, flora and fauna	Protection of international and national designated sites and their qualifying features; preservation and enhancement of notable habitats and species, particularly those noted for their conservation value or under threat; identification of the roles and responsibilities of organisations including local authorities to protect and enhance biodiversity including the creation of local Biodiversity Action Plan (BAP) habitats and species and promotion of BAP species; provision of new/restored habitat to enable species to adapt to the future impacts of climate change.
Water environment	Promote the sustainable use of water resources to meet future growth in demand and impacts of climate change; better regulation and management of the water environment to benefit water resources and flood risk, and reduce water pollution; and promotion of sustainable drainage systems (SuDS).
Geology and soils	Long term protection, improvement and sustainable management of soil quality and quantity, including the preservation of best and most versatile land; and the management and remediation of contaminated land to reduce the risk to human health and the environment, particularly soils and water quality.
Historic environment	Protection and enhancement of nationally and locally important heritage assets and historic landscapes; better integration of heritage protection within the planning regime; and providing better access to heritage sites including their promotion as an economic asset.
Population	Protect and improve human health, wellbeing and living standards; greater integration of socio-economic and environmental objectives to deliver sustainable development; promotion of prosperous, sustainable and coherent communities; provision of better public transport and access; reduction of flood risk; enhancement of recreation and amenity resources to benefit health and wellbeing; and

SEA topic	Key themes
	development and provision of measures to enable adaptation to the impacts of climate change.
Material assets	Improvement and better management of material assets including highways and utilities infrastructure; greater provision and enhancement of green infrastructure to deliver benefits to people and the environment; and provision of better public services to deliver socio-economic benefits.
Air quality	Protection of air quality in urban areas through enhanced management of polluting emissions.
Climate	Requirements to reduce future greenhouse gas emissions across all socio-economic sectors to limit the impacts of climate change of people and the environment; and provision of measures to enable future adaptation to the impacts of climate change and increase resilience.

4 Environmental characteristics and key issues

4.1 Introduction

A search of baseline environmental information has been undertaken to identify the key environmental characteristics of the borough. This includes details of the environmental status and condition of notable environmental features; current and future predicted trends in the evolution of the environment; and issues and problems currently affecting the environment.

The information obtained through this desk study is set out in the following topic-specific sections, many of which are inter-linked. The information used to characterise the baseline environment is broadly strategic in nature and reflects the high-level objectives of the LFRMS. It has been obtained from a broad range of sources and no new investigations or surveys have been undertaken as part of the scoping process. The baseline may require updating throughout the duration of the SEA process as the LFRMS is developed further and new information becomes available.

4.2 Landscape and visual amenity

Much of the riverside area of Thurrock is highly urbanised, with a mixture of industrial and residential development at the western and eastern ends. The landscape character of Thurrock is not uniform, with the main physical feature being the River Thames, which forms the southern border of the borough, with the bank of the Thames being heavily urbanised between Aveley Marshes and Tilbury, and again around Holehaven Creek (Thurrock Council, 2006). The landscape of the borough divides roughly into industrial/urban land south of the A13 and mixed urban, village and rural land to the north of the A13. Approximately 60% of the borough is open countryside, predominantly agricultural land and dispersed villages. Approximately 70% of Thurrock is designated as Metropolitan Green Belt (URS, 2014).

The built environment of Thurrock is very varied, with redevelopment and renewal of the area creating mainly residential developments along the banks of the Thames. Old industrial sites have also been developed into new housing areas and the Lakeside retail development. Historically, the main urban centres have grown up around the riverbank industries including oil, aggregate, cement works, scrapyards, power stations and docks (Scott Wilson, 2009a). The main settlements include Grays, Stanford-le-Hope, Corringham, South Ockendon and Tilbury (Figure 4-1). Post-war suburban residential areas have expanded and, in some cases, merged with others. Villages in open countryside have not expanded due to Green Belt restrictions, and have therefore retained a small scale and rural character (Thurrock Council, 2006).

Farmland is the major land use in Thurrock, with a mosaic of ditches, hedgerows, woods, ponds, pasture and field margins (Thurrock Council, 2007). There are also the Thames Terraces, of which the Purfleet-Grays ridge rises from the Thames to 25m above sea level, forming a central belt of sands and gravels across the borough (Thurrock Council, 2007).

There are two SLAs classified for their landscape importance in a regional and countrywide context; the Mardyke Valley and Langdon Hills (Thurrock Council, 2011a). These areas are designated by Thurrock Council to safeguard areas of regional or local landscape importance from inappropriate developments.

The highest elevations of the borough are .in the north-east, where ground levels reach approximately 50m Above Ordnance Datum (AOD). There are natural low points along the fluvial floodplain of the River Mardyke in the north-west, and Stanford Brook in the south-east corner, with ground levels between 2 and 6m AOD (URS, 2014)

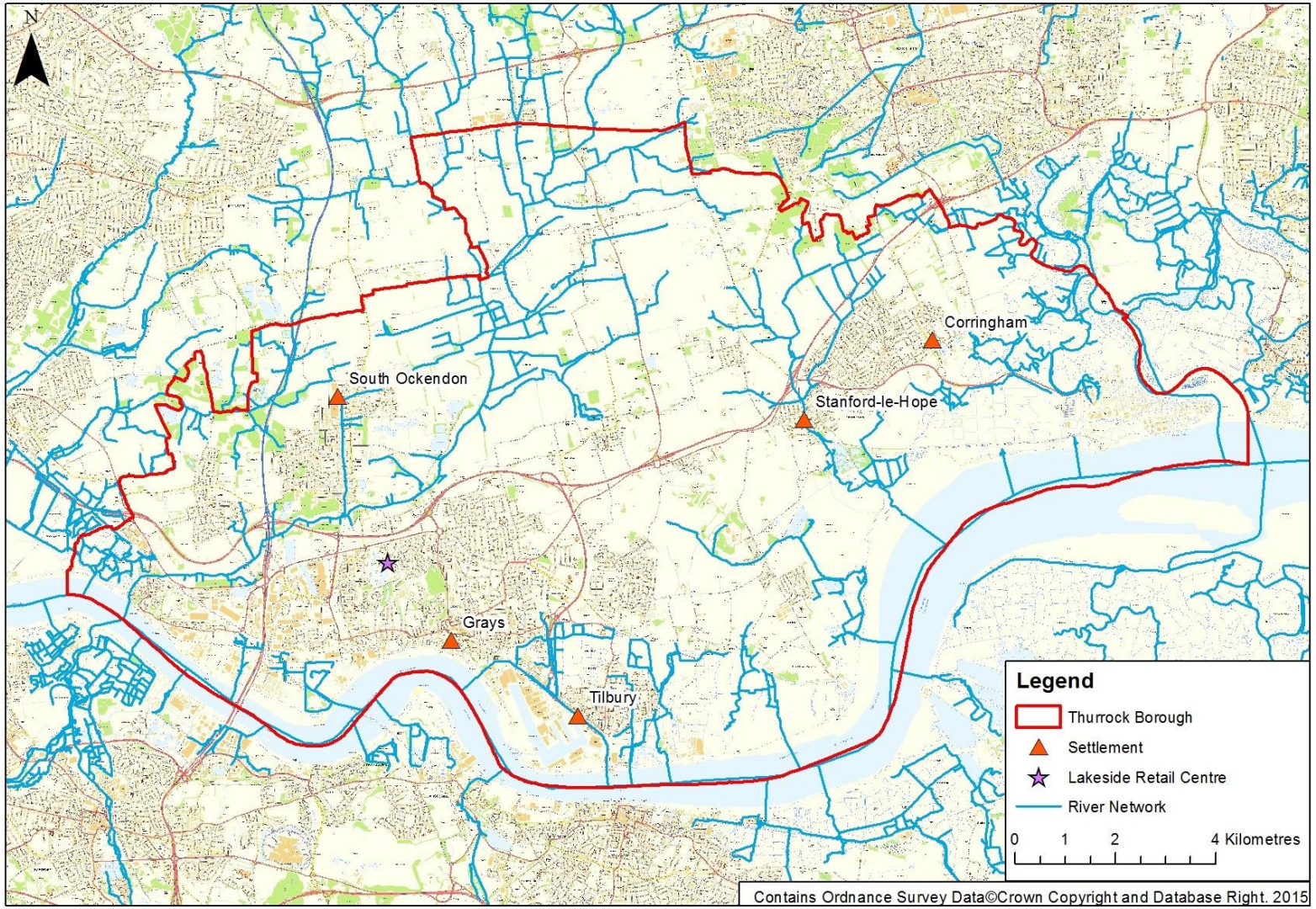

Figure 4-1: Main settlements and river network in Thurrock

There are no AONBs or National Parks in the borough of Thurrock. Thurrock is in the Northern Thames Basin (111) National Character Area (NCA), which extends from Hertfordshire in the west to the Essex coast in the east (Natural England, 2013). The countryside has suffered from the effects of mineral working and the landfilling of waste, and continues to be affected by other land use changes associated with urban fringe activities and changing agricultural land management practices (Chris Blandford Associates, 2005). However, there are strategies to improve the landscape character of the borough, such as the South Essex Green Grid Strategy, which was launched in 2008 to create five major green infrastructure projects in South Essex, including the creation of Thurrock Thameside Nature Park in Mucking (Parklands South Essex, 2009).

Thurrock's landscape character can be divided into five distinct types and areas (Thurrock Council, 2006):

- Fenland – North Thurrock around Bulphan.
- Rolling farmland/wooded hills – North Thurrock around Langdon Hills and Horndon on the Hill.
- Marshland – to the east of Thurrock along the Thames Estuary.
- Urban fringe – Thurrock's urban areas apart from Stanford-Le-Hope and Corringham.
- Urban areas – Aveley, Chadwell St Mary, Corringham, Grays, Purfleet, Stanford-Le-Hope, Tilbury and West Thurrock.

The Thames forms a distinctive 'riverscape' along the southern edge of the borough. In the west near Aveley Marshes, the Thames is narrow, widening towards Holehaven Creek in the east. The banks of the river are penetrated by large creeks, smaller inlets and bays. The river bank is heavily industrialised between Aveley Marshes and Tilbury, and again around Holehaven Creek (Chris Blandford Associates, 2005).

4.2.1 Key environmental issues

Key issues and challenges arising from current and anticipated forces for change in the Thurrock landscape are (Chris Blandford Associates, 2005):

- Arresting the further dilution of landscape character resulting from current farming practices.
- Ensuring that any potential new peripheral urban development is sited to minimise impacts on landscape character and visual amenity.
- Improving the transport network in an effort to reduce high traffic levels that create noise intrusion and barriers to movement within the borough.
- Addressing the adverse impacts of small-scale incremental changes on the character and quality of the landscape.

Pressure from new development and associated infrastructure are likely to present significant challenges as the area responds to an increasing population and the demands of economic development and climate change.

Flood risk management measures have the potential to affect the landscape characteristics in the borough. This includes changes to the river corridors, impacts on existing open spaces, and impacts on the setting of local landmarks and landscape features. Many of these aspects are protected through regional and local policies and as such could restrict the implementation of LFRMS objectives if they are shown to present a risk to the quality of the landscape.

4.3 Biodiversity, flora and fauna

4.3.1 Designated nature conservation sites

Thurrock supports internationally designated nature conservation sites. There is one Ramsar and SPA site within the borough, and three Ramsars and SPAs within 15km of Thurrock's boundary (Figure 4-2). These sites are all designated as both SPA and Ramsar and are all estuary sites to the east of the borough. The borough does not support any SACs, but there are three within 15km (Figure 4-2). European sites within 15km of Thurrock are described in Table 4-1.

Table 4-1: European sites within 15km of Thurrock borough

Site name	Distance from Thurrock	Qualifying and Interest features
Thames Estuary and Marshes SPA and Ramsar	Within – borders the coastline around Stanford-le-Hope and Tilbury	The site is a complex of brackish, floodplain grazing marsh, ditches, saline lagoons and intertidal saltmarsh and mudflat. The Ramsar is designated for one endangered plant species (least lettuce *Lactuca saligna*) and at least 14 nationally scarce plants of wetland habitats. The site also supports more than 20 British Red Data Book invertebrates. The site also supports a bird assemblage of international importance, and a variety of bird species occur at levels of international importance. These include the ringed plover *Charadrius hiaticula*; black-tailed godwit *Limosa limosa islandica*; grey plover *Pluvialis squatarola*; red knot *Calidris canutus islandica*; dunlin *Calidris alpina alpina*; and common redshank *Tringa tetanus tetanus* (JNCC, 2000).
Benfleet and Southend Marshes SPA and Ramsar	3.6km east	This site comprises an extensive series of saltmarshes, mudflats and grassland which support a diverse flora and fauna, including internationally important numbers of wintering waterfowl. It is designated for waterfowl assemblages of internationally importance and populations occurring at levels of international importance (JNCC, 1994).
Medway Estuary and Marshes SPA and Ramsar	8.6km south-east	This site has a complex of rain-fed, brackish, floodplain grazing marsh with ditches, and intertidal saltmarsh and mudflat. The site is designated for its rare plants and animals, with at least 12 British Red Data Book species of wetland invertebrates. There are also waterfowl assemblages of international importance and populations of several bird species at levels of international importance (JNCC, 1993).
North Down Woodlands SAC	9km south	Designated for two Annex I habitats, *Asperulo-Fagetum* beech forests and yew *Taxus baccata* woods (JNCC, 2014a).
Crouch and Roach Estuaries SPA and Ramsar	10km north-east	The site is designated for its assemblage of rare, vulnerable or endangered species or sub-species of plant and animal including 13 nationally scarce plant species. As with the other sites, there are waterfowl assemblages of international importance and populations at levels of international importance (JNCC, 1998).
Essex Estuaries SAC	10km north-east	Designated for the habitats that exist at the site, for example estuaries, mudflats, sandflats and Atlantic salt meadows, among others (JNCC, 2014d). Epping Forest SAC is approximately 16km north-west of Thurrock. The site has an Annex I habitat that is a qualifying feature; Atlantic beech forests (JNCC, 2014e). This site overlaps the Crouch and Roach SPA and Ramsar.
Peters Pit SAC	12km south	Designated for the presence of the great crested newt *Triturus cristatus*, an Annex II species (JNCC, 2014b).

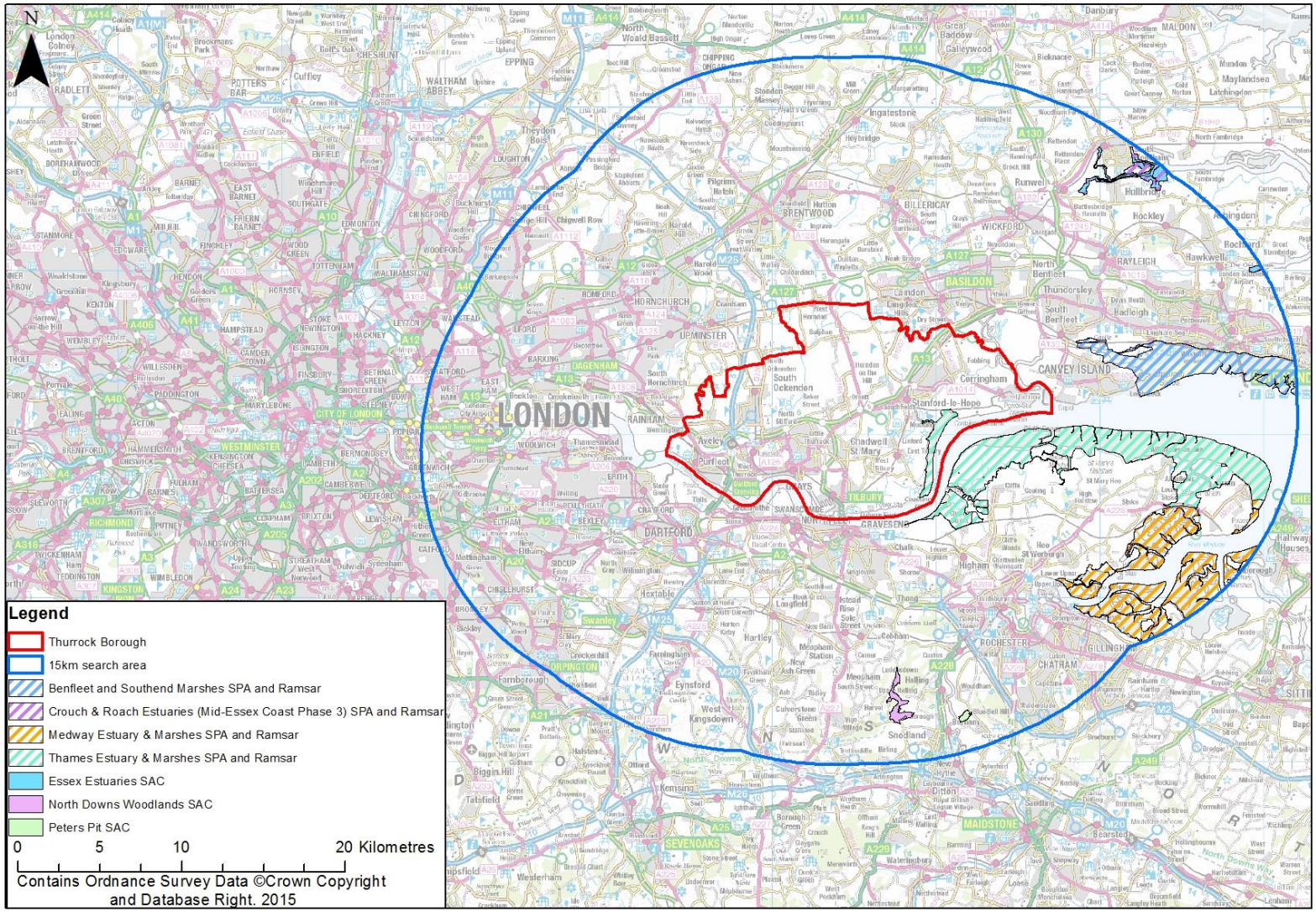

Figure 4-2: European sites within 15km of Thurrock

There are 12 SSSIs in Thurrock (Figure 4-3) with 57% of these sites classified by Natural England as in a favourable condition (Thurrock Council, 2011a). Thurrock's SSSIs are described in Table 4-2.

Table 4-2: SSSIs within Thurrock borough

SSSI name	Location	Interest features	SSSI condition
Mucking Flat and Marshes SSSI	South-east. Covers a portion of the Thames Estuary and Marshes Ramsar and SPA.	Waterfowl and estuarine habitats. The mudflats form the largest intertidal feeding area for wintering wildfowl and waders west of Canvey Island.	Favourable (94.13%) Unfavourable – recovering (5.87%)
Holehaven Creek SSSI	Eastern border, extending to the Thames.	Regularly supports nationally important numbers of wintering black-tailed godwit.	Favourable (100%)
Inner Thames Marshes SSSI	Western border, extending to the Thames	Forms the largest remaining expanse of wetland bordering the upper reaches of the Thames Estuary.	Favourable (42.37%) Unfavourable – recovering (17.8%) Unfavourable – no change (5.73%) Unfavourable – declining (31.36%) Destroyed (1.15%)
Vange and Fobbing Marshes SSSI	Eastern border	Unimproved coastal grassland and associated dykes and creeks support a diversity of maritime grasses and herbs.	Favourable (85.69%) Unfavourable – recovering (14.31%)
West Thurrock Lagoon and Marshes SSSI	Borders the Thames close to Grays	One of the most important sites for wintering waders and wildfowl on the Inner Thames Estuary.	Unfavourable – no change (33.31%) Unfavourable – declining (66.69%)
Basildon Meadows SSSI	North-east	Three unimproved herb-rich meadows lying on neutral soils, among the few areas of old pasture known to remain in Essex.	Favourable (100%)
Gray's Thurrock Chalk Pit SSSI	Grays	Active mineral extraction which ceased in the 1920s has led to a natural colonisation of the pit with woodland, scrub and calcareous grassland habitats important for assemblage of invertebrate fauna.	Unfavourable – recovering (100%)
Purfleet Chalk Pits SSSI	West	Contains complex lithostratigraphical and biostratigraphical evidence indicates the importance of evolution of Thames and Northern European interglacial sequences.	Favourable (56.57%) Unfavourable – declining (35.48%) Destroyed (7.96%)
Lion Pit SSSI	Grays	Exhibits a complex sequence of Pleistocene Thames deposits, which have yielded molluscs, ostracods and pollen.	Favourable (100%)
Purfleet Road, Aveley SSSI	West	Aveley silts and sands have yielded important assemblages of molluscs, insects, pollen and mammal remains which are indicative of temperate, or interglacial, conditions.	Favourable (23.75%) Unfavourable – no change (76.25%)
Globe Pit SSSI	Grays	An important site for the interrelationship of archaeology with geology, since it provides	Favourable (100%)

SSSI name	Location	Interest features	SSSI condition
		correlation of the Lower Palaeolithic chronology with Pleistocene Thames Terrace sequence.	
Hangman's Wood Deneholes SSSI	Grays	Contains remains of medieval chalk mines, which provide the most important underground hibernation site for bats in Essex, with three species of bat recorded. Hangman's Wood is an area of semi-natural habitat in which bats can feed and is a relict fragment of ancient woodland and is a scheduled monument	Favourable (100%)

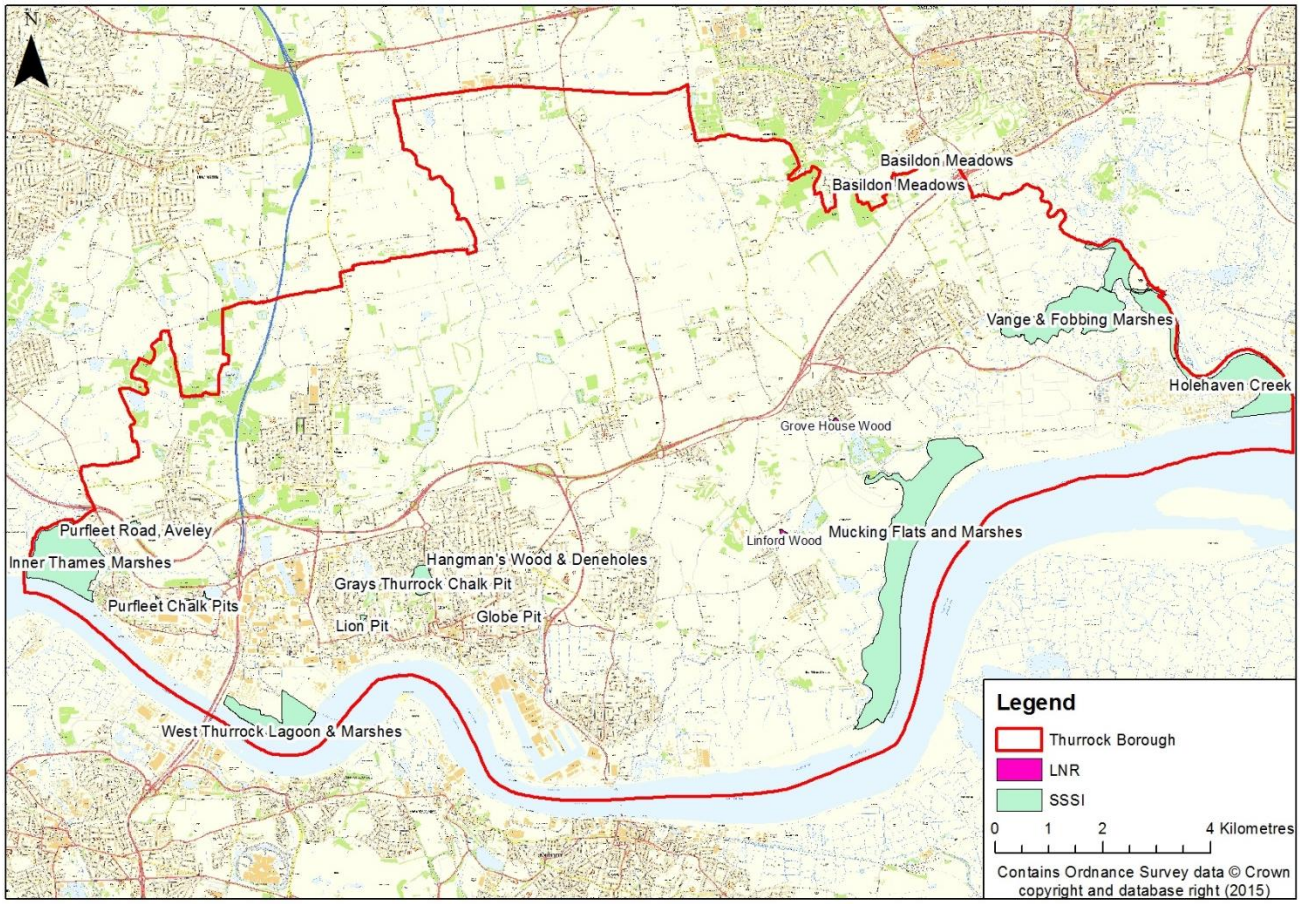

Figure 4-3: SSSIs and LNRs in Thurrock

There are no National Nature Reserves (NNR) in Thurrock, but three NNRs within 15km (Table 4-3).

Table 4-3: NNRs within 15km of Thurrock

Site name	Distance from Thurrock	Qualifying and Interest features
Swanscombe Skull Site NNR	2km south	Site is of national importance because of the prehistoric fossils discovered here, including one of the oldest human skulls ever found in the UK.
Leigh NNR	5km east	The flats at Leigh NNR support a wide variety of birds, particularly migratory species.
High Halstow NNR	6km south-east	The NNR is a complex mosaic of scrub and woodland habitat, dominated by hawthorn scrub and ancient oak woodlands, with regenerating elm woodland. The most important feature of this site is the heronry, which has over 200 pairs, making it the largest heronry in Britain.

Thurrock borders the Thames Estuary recommended Marine Conservation Zone (rMCZ), a site that is proposed to be designated for the many fish species that breed in the river, including eel and smelt (The Wildlife Trusts, 2012).

Part of the Thurrock borough is also located within the Greater Thames Marshes Nature Improvement Area (NIA), one of 12 areas funded by the Government to bring key partners together to plan and deliver significant improvements for wildlife and people. The NIA covers over 50,000ha of marshland and estuarine habitat (Greater Thames Marshes, 2015). The biodiversity of the NIA is considered to be underperforming as biodiversity is in decline and struggling to compete with the increasing pressures of climate change and development (Natural England, 2014).

4.3.2 Local designated sites

There are only two Local Nature Reserves (LNR) within the borough (Figure 4-3). These are Linford Wood and Grove House Wood in the eastern half of the borough. Linford Wood LNR is a woodland that consists of hedgebank, mixed woodland willow plantation, ditches and open area, surrounded by arable farmland. Grove House Wood LNR has reedbeds, a pond and a brook as well as woods, and is an important local habitat for wildlife.

There are 70 Local Wildlife Sites (LWS) (Thurrock Council, 2011a). These are sites that are of local importance and are designated by the local authority, however, they have no statutory protection. The LWSs include ancient woodland, hedgerows and green lanes, post-industrial brownfield sites, reedbeds and chalk grassland. Of the 70 LWSs, 33 sites have positive management plans in place (URS, 2013).

There are six nature reserves managed by the Essex Wildlife Trust in Thurrock, mainly in the east of the borough. Fobbing Marsh nature reserve, in the east of the borough, is one of the few remaining Thameside grazing marshes, part of which was dammed in the aftermath of the 1953 floods. It also support the nationally rare least lettuce (Essex Wildlife Trust, 2014a). Also in the east is Thurrock Thameside Nature Park which includes a landfill site that is being transformed into a Living Landscape with views over Mucking Flats SSSI and Thames Estuary SPA (Essex Wildlife Trust, 2014b). Stanford Warren nature reserve is located adjacent to the River Thames, and consists of one of the largest reedbeds in Essex. The reeds provide habitat for many birds over the year (Essex Wildlife Trust, 2014c). Hornden Meadow is also in the east of the borough, and is less than one hectare in size, but has about 80 species of wildflowers (Essex Wildlife Trust, 2014d). Chafford Gorges nature reserve in Greys is the only site in the west of Thurrock. The park provides green space for wildlife and the population of Chafford Hundred and overlooks Warren Gorge (Essex Wildlife Trust, 2014e).

4.3.3 Notable habitats and species

As described above, Thurrock has a variety of habitats, including ancient woodland and coastal and floodplain grazing marsh. Ancient woodland does not cover a large amount of Thurrock, being mainly fragmented in the west and north (Figure 4-4).

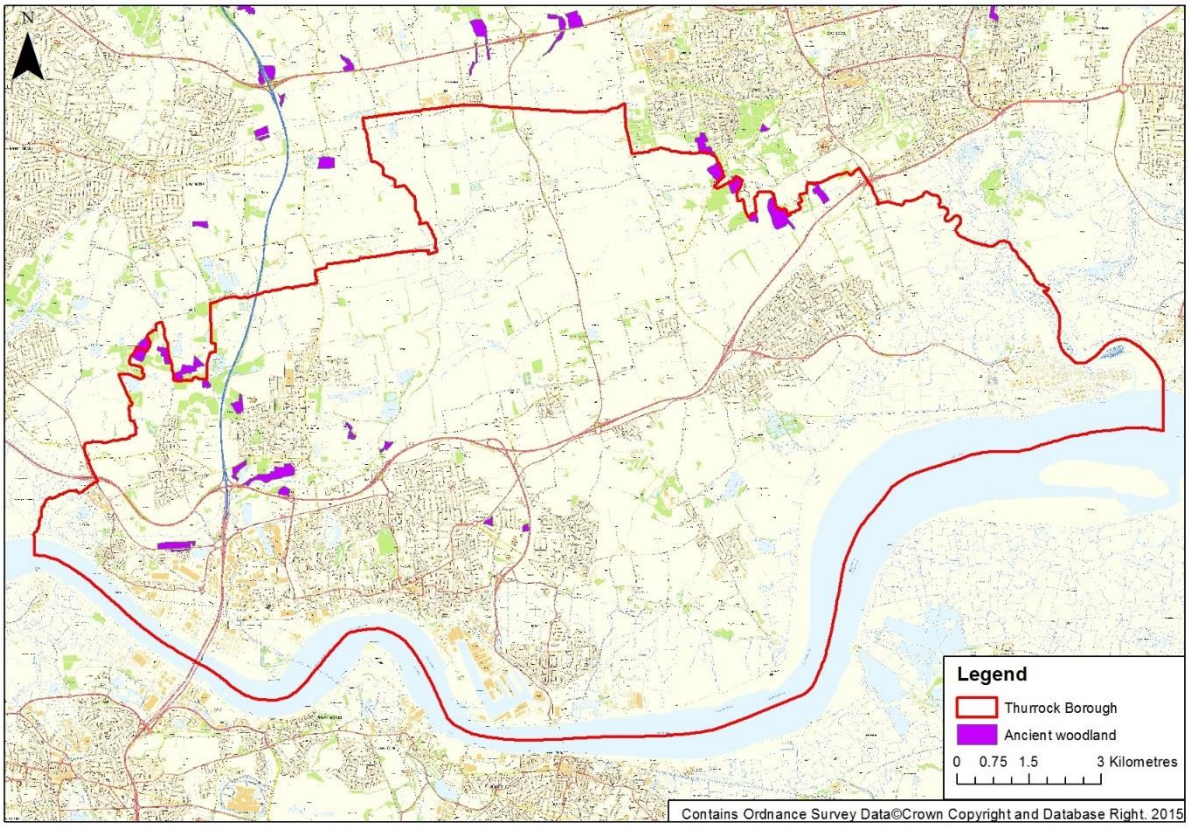

Figure 4-4: Ancient woodland in Thurrock

Coastal and floodplain grazing marsh data was provided by Thurrock Council. This marsh is periodically inundated pasture, or meadow, usually mesotrophic, with ditches which maintain water levels and contain standing brackish or fresh water. This habitat type is generally present along watercourses, and is particularly prevalent in the east of the borough (Figure 4-5). These ditches are especially rich in plants and invertebrates. Grazing marshes are particularly important for breeding waders such as snipe *Gallinigo gallinigo*, lapwing *Vanellus vanellus* and curlew *Numenius arquata*.

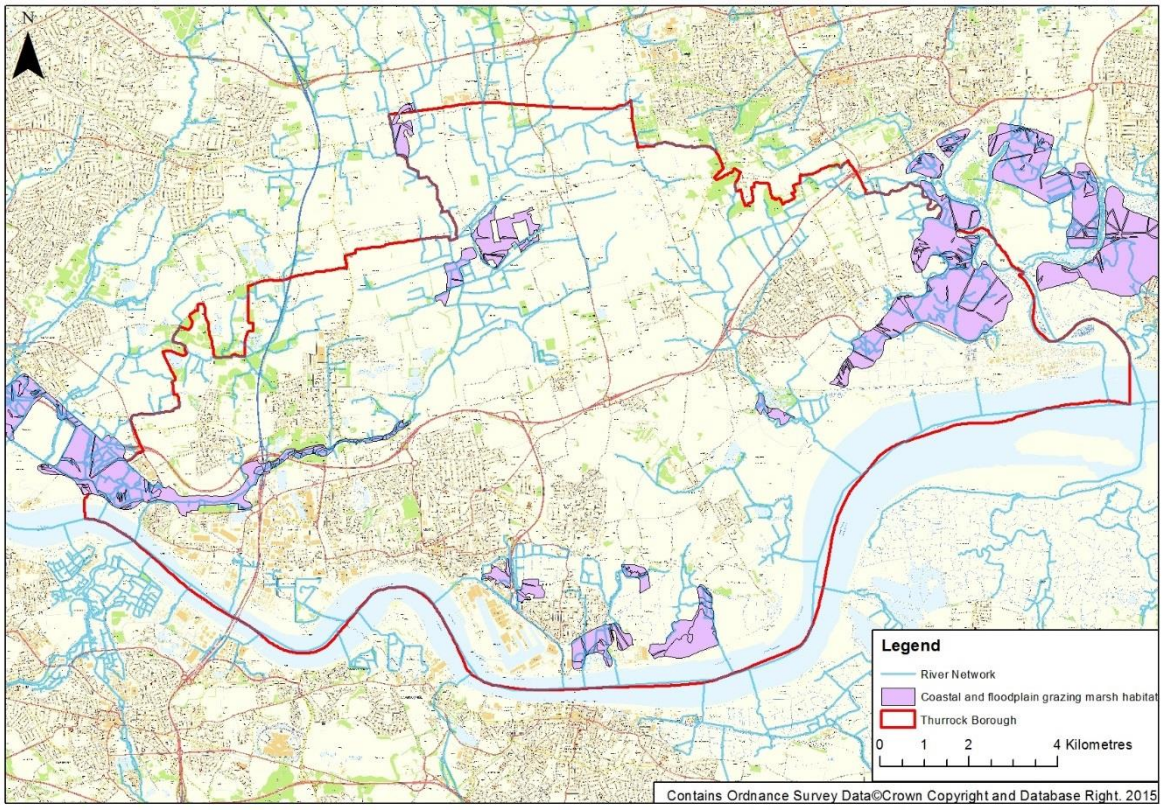

Figure 4-5: Coastal and floodplain grazing marsh in Thurrock (Source: Thurrock Council)

Other priority BAP habitats that are present include wet woodland, grassland, reedbeds, purple moor grass rush pastures, mudflats, lowland meadows and lowland heath. These habitats are mainly present in the east and south of the borough (Figure 4-6).

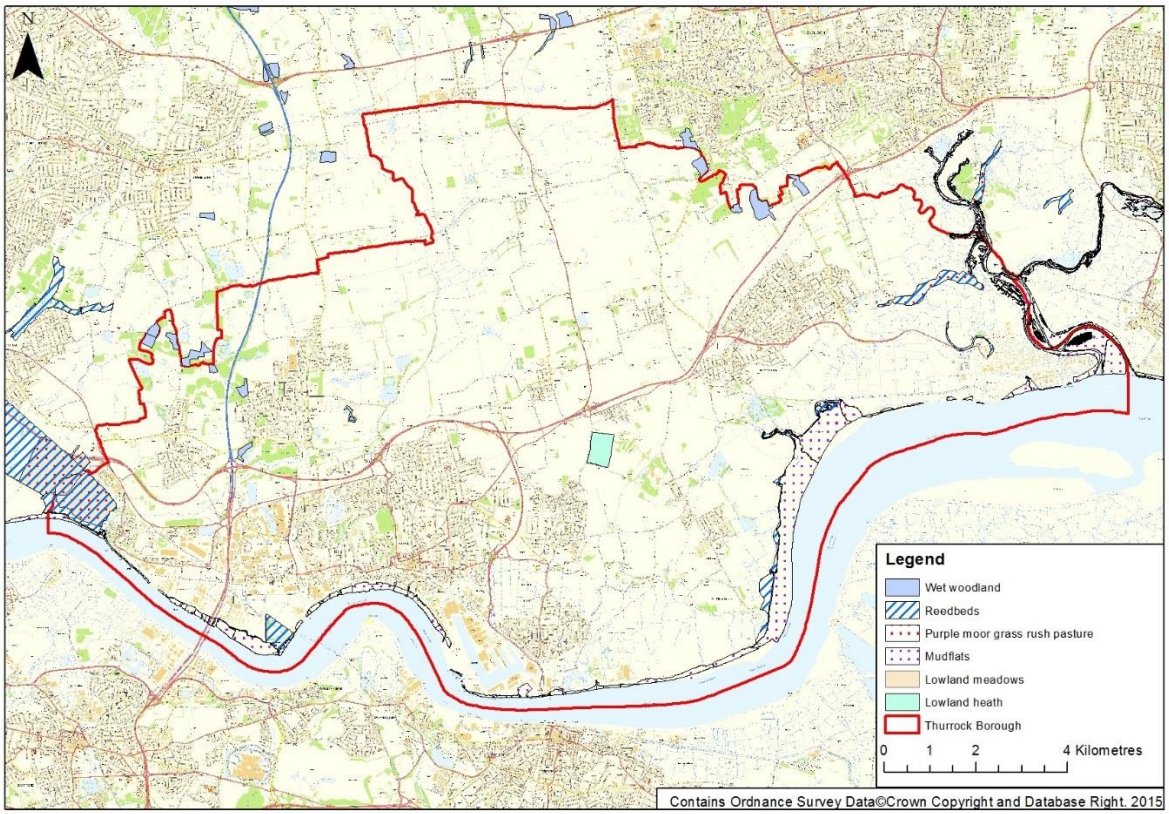

Figure 4-6: Priority BAP Habitats in Thurrock

The following priority habitats are listed as part of the Essex BAP, which sets out the species and habitats that should be protected and enhanced within the borough. Each habitat has an independent Habitat Action Plan (HAP) (Essex Biodiversity Project, 2012a):

- Arable field margins
- Hedgerows
- Traditional orchards (and Essex Apple varieties)
- Lowland dry acid grassland
- Lowland meadows
- Lowland heathland
- Ponds
- Floodplain and coastal grazing marsh
- Lowland raised bog
- Reedbeds
- Coastal saltmarsh

More locally, key habitats for Thurrock include (URS, 2013):

- Estuarine: coastal areas from Corringham to East Tilbury provide nationally important feeding grounds for a wide variety of over-wintering waders and wildfowl.
- Farmland: as the major land use within Thurrock, sympathetic management of farmland is considered to be vital to the conservation of the areas wildlife and landscape.
- Thames terraces: the Purfleet-Grays ridge rises from the Thames, forming a central belt of sands and gravels across the borough, where short acidic grassland can develop.
- Woodland: there are many semi-natural broad-leaved woods in the north of the borough, covering 2% of the land area.

The coastal zone supports some of Thurrock's most important wildlife sites, particularly at Stanford and Corringham which provide national important feeding grounds for a wide variety of over-wintering waders and wildfowl. The estuarine habitat in Thurrock borough supports a complex of coastal grassland, watercourses and fringing saltmarsh that supports numerous invertebrates, birds and nationally rare plants (Thurrock Council, 2007).

On the Thames Terraces, where the soils remain unimproved or the underlying minerals are exposed due to extraction, short acidic grasslands can develop. These areas of grassland and short scrub support nationally important assemblages of insects (Thurrock Council, 2007).

Semi-natural broad-leaved woodlands cover about 2% of the land area in Thurrock, mostly in the north of the borough. Most of these are former coppice woods that were managed to produce an annual harvest of wood. Typically, the woodlands are hazel, hornbeam or sweet chestnut coppice with pedunculate oak and ash standards (Thurrock Council, 2007).

The following priority species are listed as part of the Essex BAP and each species has an independent Species Action Plan (SAP) (Essex Biodiversity Project, 2012b):

- Badger *Meles meles*
- Barn owl *Tyto alba*
- Bats
- Nesting birds
- Dormouse *Muscardinus avellanarius*
- Great crested newt
- Invertebrates
- Otter *Lutra lutra*
- Reptiles
- Water vole *Arvicola amphibius*

- White-clawed crayfish *Austropotamobius pallipes*
- Wildflowers.

4.3.4 Fisheries

The River Mardyke is designated a cyprinid freshwater fishery. Many species of fish occur in the Mardyke river valley, the most common are roach *Rutilus rutilus*, carp *Cyprinus carpio*, eel *Anguilla anguilla*, perch *Perca fluviatilis* and chub *Squalius cephalus* in the upper reaches and tench *Tinca tinca*, rudd *Scardinius erythropthalmus* and flounder *Platichthys flesus* mainly restricted to lower river sections. Problems with water and habitat quality are believed to be the main contributory factors to poor fish stocks in the Mardyke (Scott Wilson, 2009a).

4.3.5 Key environmental issues

The rural areas within Thurrock are under increasing pressure from development and changes in land use, particularly as a result of changes in farming practice, alternative uses for buildings in the countryside and pressure for outdoor recreation, leisure and commercial uses. Development pressure is arising from the Thames Gateway, which is developing marshland. Some brownfield land has high biodiversity value, and promoting development on brownfield land that is sympathetic to biodiversity is a key challenge.

A large number of designated sites, particularly those within the NIA, are under pressure from climate change and development. These are dependent on underlying hydrological conditions and are therefore vulnerable to flooding and changes in hydrology. These sites support a number of species that are reliant on tidal habitat, and are subsequently are at risk from flooding events, poor water quality, changes to hydrological/tidal regimes and habitat changes.

Future incidences of flooding could potentially damage and change the nature of habitats and supporting species composition within the designated nature conservation sites both within and outside the borough. The LFRMS will need to consider whether any flood risk management measures will lead to adverse impacts on the water bodies within the borough and whether the LFRMS can help contribute to delivering any mitigation measures such as through improvements to fish passage. Implementation of the LFRMS may also provide opportunity to enhance or create new habitats within the borough.

Flooding and flood risk management has the potential to significantly impact on a number of species of note in the borough. Some, such as water vole and white-clawed crayfish, are dependent upon aquatic and riparian habitats, and are sensitive to changes in habitat conditions, changes in water quality, flow, vegetation cover and bank profile. Great crested newt, a species protected under national and European law, are water dependent species found in the borough.

4.4 Water environment

4.4.1 Water resources

The East of England is the driest region in England and is one of the fastest growing in terms of development, and consequently water resource availability is limited, with supply-demand issues in parts of the region. There is little or no water available from existing sources within Thurrock and therefore future development will be served by the increase in storage at Abberton Reservoir near Colchester, which was completed in 2014 (URS, 2013). Water supply in Thurrock is supplemented via the Thames Water Utilities raw water bulk supply from Lea Valley reservoirs to Chigwell Water Treatment Works, along with two local water supply boreholes in Thurrock itself at Linford and Stifford (Scott Wilson, 2009a).

Thurrock is part of the fully integrated Essex water resources zone, which is controlled by Essex and Suffolk Water. There are no identified pressure or capacity issues in the water supply infrastructure, with local reinforcements provided within Thurrock (Scott Wilson, 2009a).

Chalk is the principal underlying aquifer of the region (Scott Wilson, 2009a). However, the impermeable London Clay precludes infiltration of rainfall over large areas of the chalk aquifer in the north of the district and beyond, thereby restricting its use in water resource development. Despite this, the aquifer is unconfined and chalk groundwater is utilised for public water supply (Scott Wilson, 2009a).

In some areas of the borough, groundwater levels are rising in response to the cessation of long-term water abstraction in the 1970s (Scott Wilson, 2009a). This has not caused an increase in flood risk from groundwater.

Main rivers in Thurrock include:

- Mardyke, located in the west of the borough, running from the north, before flowing westwards to where it enters the Thames at Purfleet. It is a fenland stream system, with two main sources at Langdon Hills and Cranham. The Mardyke catchment is 111.6km^2 and has a main river length of 18.5km (Scott Wilson, 2009a).
- Tidal River Thames flowing along the southern boundary of the borough, and is entirely tidal along this stretch.

In addition to the two main river systems, there are several smaller watercourses, ditches and drains within the borough:

- Stanford Brook, Manor Way Creek and Fobbing Creek in the east of borough.
- Gabbions Sewer, Stone House Sewer, East Tilbury Dock Sewer and West Thurrock Sewer. These are low flow channels with no additional capacity to accept surface water runoff.

Water resources within a catchment are assessed and monitored by the Environment Agency within a Catchment Abstraction Management Strategy (CAMS). There are two water resource management units (WRMU) covering the Thurrock area; The Mardyke and Thameside Chalk. Throughout the Mardyke catchment, London Clay heavily confines the chalk aquifer resulting in a lack of hydraulic connection between river and aquifer. Abstraction in the Mardyke has developed significantly and water is utilised for a range of purposes. Agriculture is the dominant sector in the upper reaches of the catchment, while industrial abstraction dominates the lower reaches (Scott Wilson, 2009a).

The Thameside Chalk catchment is exposed at or near the ground surface near Thurrock, with flow from other areas of the Upper Chalk likely to be a significant source of recharge. The unit has been assessed as having no water available for further abstractions (Scott Wilson, 2009a).

4.4.2 Water Framework Directive

Thurrock is covered by the Thames River Basin Management Plan (RBMP), which identifies the current quality of water bodies in the borough and sets objectives for making further improvements to the ecological and chemical quality.

The River Mardyke drains a significant proportion of the borough and flows south and then south--west through Thurrock to its confluence with the River Thames at Purfleet. The Mardyke catchment is generally low-lying with low channel gradients and is predominantly agricultural. The Mardyke is generally not designated as a Heavily Modified Water Body (HMWB), and has an overall status of Moderate under the Water Framework Directive (WFD) (Environment Agency, 2009). One of the key objectives under the WFD is the requirement to prevent deterioration in the current status of water bodies, whilst HMWB must achieve 'good ecological potential' (GEP) within a set deadline. If an activity has the potential to impact on the ecology or morphology of the water body, the risk of causing deterioration in the status must be assessed. The Mardyke generally has a Moderate ecological status, however, the Mardyke (West Tributary) and Mardyke (East Tributary) have a Poor overall status and Poor ecological status, although it is not designated as a HMWB. The Mardyke and Fobbing water body is designated as a HMWB and has Moderate ecological potential under the WFD. Overall, Mardyke and Fobbing are classed as Moderate. Issues to the WFD status of the Mardyke catchment arise from its significant physical modifications to facilitate flood conveyance and land drainage (Environment Agency, 2009).

The section of Thames south of Thurrock extending east to Stanford-le-Hope is classed as the 'Thames Middle' water body, and is designated as a HMWB, with a current overall potential of Moderate. The Thames Lower water body runs east from Stanford-le-Hope and is also designated as a HWMB, with an ecological and overall status of Moderate.

4.4.3 Surface water quality

Water quality within the lower stretches of the River Mardyke, which flows through Thurrock's urban area, is currently moderate to poor quality and fails to meet 'good ecological status' under the WFD (URS, 2013). The very shallow gradient and low river flows exacerbates the poor water quality (Scott Wilson, 2009a).

Chemical water quality of the River Mardyke in the years 2005-2007 has been recorded as poor or bad, whilst the biological value has been recorded as good or fairly good. Nitrates are moderately low to moderate and phosphates are excessively high (Scott Wilson, 2009a). The lower reaches of the Mardyke have a history of suffering from low dissolved oxygen levels as a result of 'ponding' which occurs when the tidal flap at the outfall is closed on the highest tides and freshwater begins to back up. In some cases, saline water enters the freshwater system and exacerbates the problem (Scott Wilson, 2009a).

The Thames Estuary is the main watercourse within Thurrock that will be affected by the planned growth within the area, as it is the receiving watercourse for the effluent discharge from Tilbury waste water treatment works. Additionally, there is poorly managed surface water runoff from Purfleet, West Thurrock and Lakeside, Tilbury and London Gateway. Further upstream of the Thames, water quality monitoring observations show levels of Ammonia, Total Organic Nitrogen and Dissolved Oxygen decrease downstream, with no evidence suggesting that surface water inputs from Thurrock increases these parameters (Scott Wilson, 2010).

Much of northern Thurrock is within a surface water Nitrate Vulnerable Zone (NVZ). These zones are designated where land drains and contributes to the nitrate found in 'polluted' waters. Thurrock is not covered by a drinking water safeguard zone.

4.4.4 Groundwater quality

Groundwater provides vital resources for public water supply in the borough. Impacts on groundwater are broadly related to land use, with agricultural areas representing a major source of nitrates. There are two main risks that affect aquifers in Thurrock; salinity and nitrate. The main source of nitrate is from agricultural inputs in the northern part of Thurrock, and excessive pumping from groundwater may also increase salinity as a result of drawing poorer quality water up from depth (Scott Wilson, 2010).

Groundwater quality in the Thameside Chalk is generally good in Thurrock, with recent infiltration to the aquifer, but becomes poor to the north and east of the WRMU where older water containing high concentrations of chloride and sodium can be found within the confined chalk (Scott Wilson, 2009a).

Thurrock is within the South Essex Thurrock Chalk groundwater body for WFD, with a current quantitative quality of good, but a chemical quality rated poor (and deteriorating). This results in a current overall status of poor (Environment Agency, 2009).

The Lakeside area and the area between Grays, Tilbury and Stanford-le-Hope are covered by groundwater source protection zones (SPZ). These zones show the risk of contamination from any activities that might cause pollution in the area. Thurrock also lies within a groundwater vulnerability zone, which highlights the importance of groundwater resources in the area.

4.4.5 Flooding

The main sources of flooding for Thurrock are the River Thames Estuary, River Mardyke, the Stanford Brook and the arterial drainage network which drains low lying areas of Thurrock. The most significant events tend to be storm surges coupled with high spring tides, as the Thames Estuary poses the greatest flood risk to Thurrock. River Mardyke poses some fluvial flood risk in the northern part of the district, however the area is predominantly rural, therefore there are few population centres under threat from flooding from this river (Scott Wilson, 2009b).

4.4.6 Key environmental issues

Within the Thames RBMP, high population densities cause a number of pressures on the water environment, such as discharges from sewage networks and high demand for water. Diffuse pollution is a major pressure on the water environment, coming from urban and rural areas. Specific pressures include abstraction and artificial flow regulation; organic pollution; pesticides; phosphate; and urban and transport pollution (Environment Agency, 2009). Thurrock has particular pressures relating to development within the Thames Gateway area, therefore

increasing pressure on water resources and also increasing risk of pollution incidents and declines in water quality.

Flooding has the potential to create pathways through which potential contamination sources (e.g. sewage treatment works) could result in pollution. Conversely, the LFRMS could help protect these sites and improve water quality.

The water bodies in Thurrock currently fail to meet good ecological status/potential under the WFD. This is partly due to the installation of structures for flood conveyance and land drainage. The LFRMS will need to consider whether any flood risk management measures will lead to adverse impacts on the watercourses within the borough and whether the LFRMS can help contribute to achieving WFD objectives and improving water quality.

4.5 Soils and geology

Chalk underlies the whole of Thurrock, and is near to ground surface in the south-west of the borough. This chalk dips southward beneath the Thames and northward beneath deep deposits of London Clay (Scott Wilson, 2009a).

There are three main soil types in Thurrock, which include groundwater dominated gley soils. Gley soils are characteristically a mixture of coarse and fine loamy permeable soils affected by groundwater. In the north-east of the borough brown soil dominates, except within flood zones. These soils are loamy or clayey with reddish or reddish mottled, clay-enriched soil.

The soils along the coastal zone are predominantly alluvial with a significant clay content and are periodically or permanently waterlogged, whereas the soils inland are predominantly clay but also exhibit a loamy characteristic making them more suitable for cultivation (Scott Wilson, 2009a). Generally the soils are fertile with the majority classified as Grade 3 or above under agricultural land classification, where Grade 1 is 'excellent quality' (Figure 4-7).

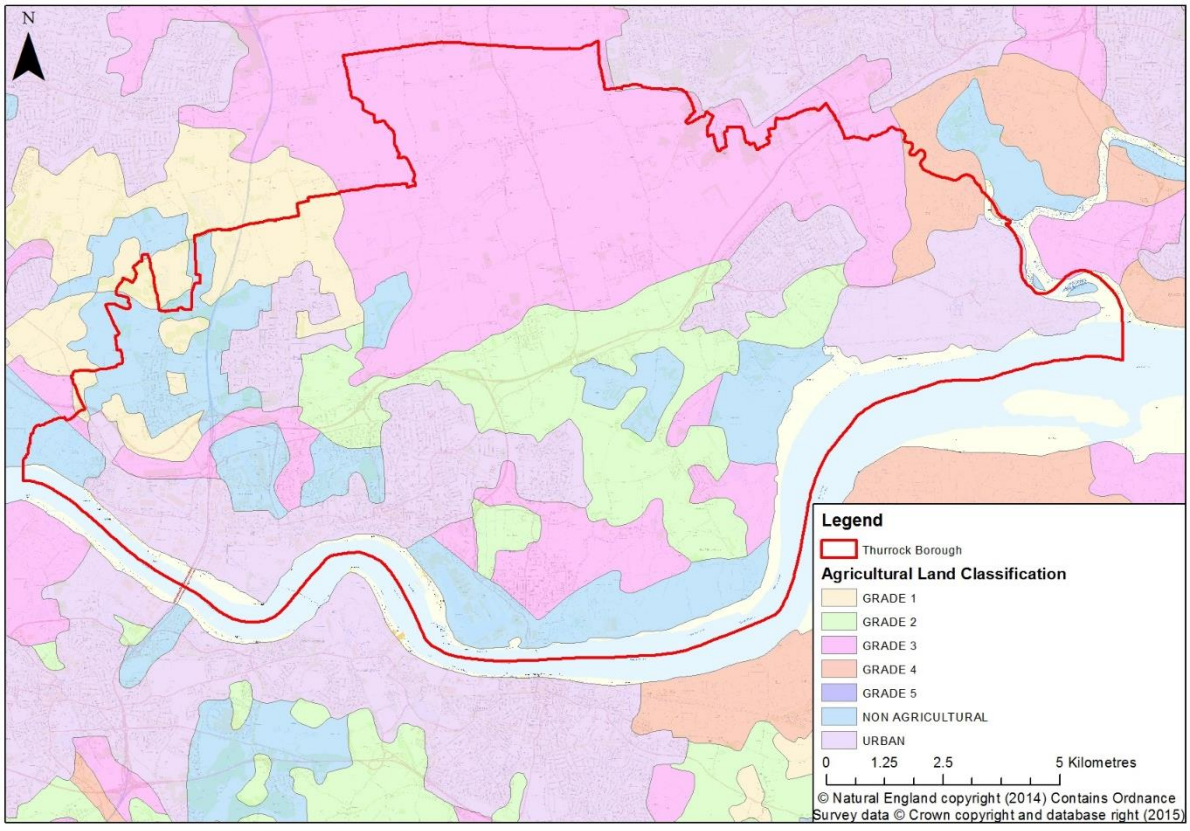

Figure 4-7: Agricultural land classification of Thurrock

The underlying geology of Thurrock is Chalk and Red Chalk, with a band to the north comprising Oldhaven, Blackheath, Lambeth Group and Thanet Beds (Figure 4-8). To the north of the A13, these layers are overlain by London Clay (Scott Wilson, 2009a). The surface geology of the borough has been strongly influenced by the natural migration of the River Thames (Chris Blandford Associates, 2005).

Adjacent to the shores of the River Thames and the Mardyke is low lying floodplain dominated by groundwater gley soils, whereas the north of the borough is seasonally waterlogged slowly permeable surface water gley soils intersected by a network of drainage ditches (Chris Blandford Associates, 2005).

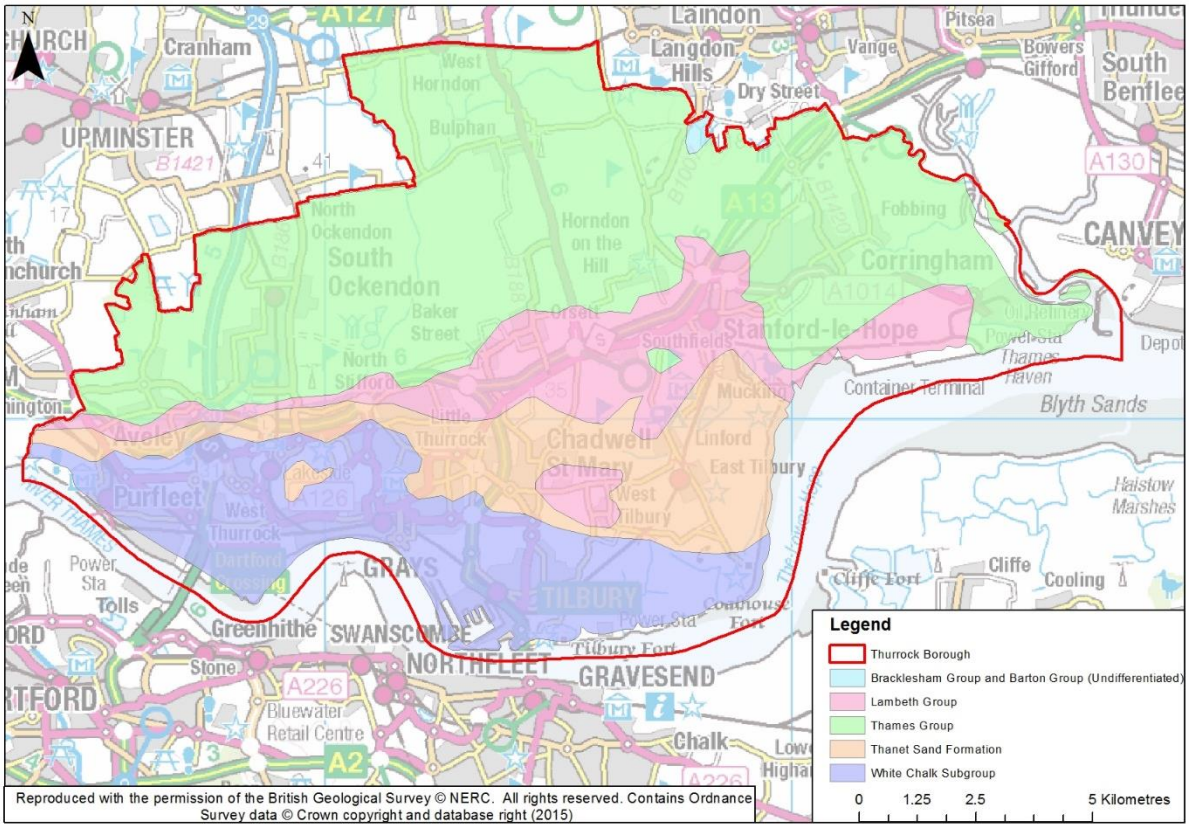

Figure 4-8: Bedrock geology of Thurrock

The drift deposit geology consists of alluvium in the south of the borough. Alluvium is also present within the floodplain of River Mardyke in the northern part of Thurrock. Alluvium consists of clays, silts, sands and gravels and the permeability can be highly variable depending on the exact composition of the material (Scott Wilson, 2010).

There are no Local Geological Sites (GeoEssex, 2015) with the borough, however there are five SSSIs that have a geological interest: Gray's Thurrock Chalk Pit SSSI; Lion Pit SSSI; Globe Pit SSSI; Purfleet Road, Aveley SSSI; and Purfleet Chalk Pits SSSI, as discussed above.

4.5.1 Key environmental issues

Flood risk management could alter the extent or duration of flooding and therefore the LFRMS will need to consider implications for soil quality and the underlying geology. Impacts on soil quality could affect other environmental receptors, such as nature conservation sites that are reliant on the underlying soil characteristics. Impacts on soil quality could affect other environmental receptors, such as nature conservation sites that are reliant on the underlying soil characteristics.

There is a need for the protection and maintenance of the integrity of the designated geological SSSIs.

4.6 Historic environment

There is evidence that people first began to settle in the area 300,000 years ago. Thurrock was a favoured area due to the rich and fertile river valleys. This history moves on to Roman times, where some fields retain prehistoric and Roman field systems. Roman settlement was centred on the Roman road towards Tilbury (Chris Blandford Associates, 2005). The name Thurrock is thought to derive from the Saxon word 'turruc', which described the bottom of a ship where water collects. The 17th century marked a new threshold in the architectural development of manor houses, consequently Thurrock has a large and diverse historic environment ranging from

prehistoric sites, medieval buildings and Tudor and Victorian forts. Historic assets in the borough (Figure 4-9) include:

- 16 scheduled monuments: these are historic sites of national importance and include Tilbury Fort and a crop mark complex.
- 241 listed buildings: these are statutorily designated and include 13 which are Grade I. These are all churches, with the exception of Government powder magazine, the only survivor of a group of five magazines built 1763-5.
- One registered park and garden: Belhus Park, designed by Capability Brown.
- Seven conservation areas: Horndon-on-the-Hill; Corringham; Orsett; Fobbing; Purfleet; West Tilbury; and East Tilbury (Thurrock Council, 2011a).

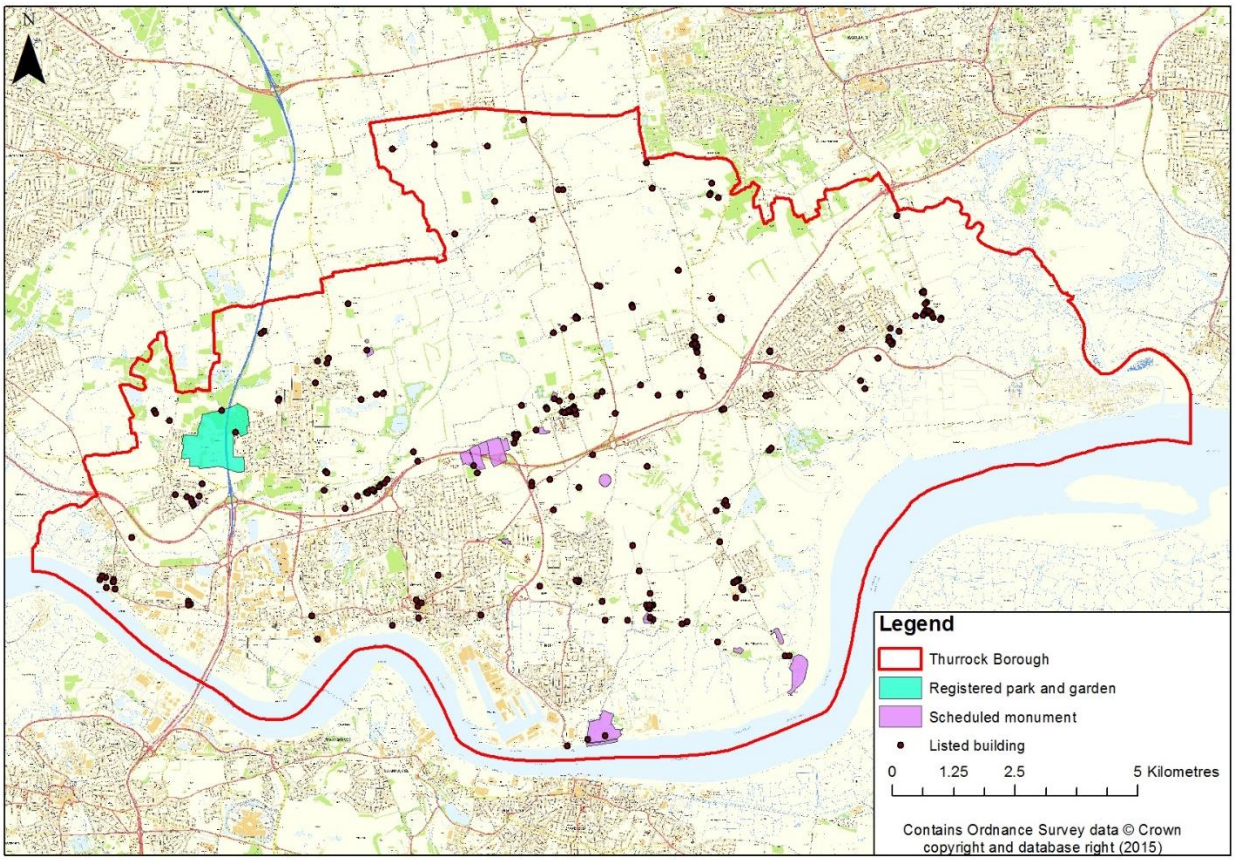

Figure 4-9: Historic assets in Thurrock

English Heritage's 'Heritage at Risk Register' (English Heritage, 2014) identifies two buildings, two archaeology entries and one conservation area as at risk. The archaeological entries are scheduled monuments, although they are not at risk from flooding. East Tilbury conservation area is described as in a 'very bad' condition. The listed buildings are not described as at risk by flooding, however Coalhouse Fort, Tilbury has a problem of water ingress to casemates (English Heritage, 2014).

4.6.1 Key environmental issues

Thurrock contains a wealth of historic assets. However, some of the most important of these sites are currently assessed as being under threat. There is a risk that adverse impacts upon aspects of Thurrock's cultural heritage could arise from flooding and increased flood risk in the future, whilst the construction and implementation of the flood risk management options selected by the LFRMS could also have adverse effects. Potential benefits may also arise from reduced flood risk to assets as a result of implementation of the LFRMS.

4.7 Population

The population of Thurrock is currently 157,705 (2011) (Thurrock Council, 2013) and is predicted to reach 183,200 in 2031, an increase of 34,300 (23%) over a 25 year period from 2006 (Thurrock Council, 2011a). This rapidly growing population is partly influenced by international immigration (Thurrock Council, 2011b).

Thurrock is expected to experience a significantly ageing population, as the proportion of people aged over 65 will increase by 13,800 people (75% increase) and people aged over 85 will more than double (141% increase) (Thurrock Council, 2011a). However, compared to the rest of England and Wales, Thurrock has a relatively young population, with an average age of 36, it is the eighth youngest in the east of England (Thurrock Council, 2014). As a result of this younger age structure, Thurrock has a higher birth rate than the national and regional average of 14.8 births per 1000 population compared to 12.5 nationally and 11.62 regionally (Thurrock Council, 2013).

Thurrock has lower proportions of people from minority ethnic communities than the national average (Thurrock Council, 2011a). However, the ethnic profile of Thurrock has changed dramatically since 2000, as in the 2001 census the ethnic minority population was 4.7%, but in 2011 had increased to 19.1%. The largest minority group were Black/African/Caribbean/Black British comprising 7.8% of the local population (Thurrock Council, 2013).

4.7.1 Health

Estimated levels of adult smoking and obesity are worse than the England average, with the rate of smoking related deaths worse than the England average (Public Health England, 2014). Life expectancy is similar to the England average, however it is 8.2 years lower for men and 7.7 years lower for women in the most deprived areas of Thurrock in comparison to the least deprived areas (Public Health England, 2014). Life expectancy is rising for both men and women in Thurrock, as well as a reduction in early deaths (Public Health England, 2014). Obesity among children is an issue in Thurrock, with approximately 20.3% of Year 6 children classified as obese (URS, 2013).

There is an identified lack of a major centre providing integrated medical services, with the Core Strategy (Thurrock Council, 2011a) stating that the network of health centres throughout Thurrock needs to be progressively extended and upgraded. This critical social infrastructure, along with residential and nursing homes, would be put under more pressure if flood risk increased.

4.7.2 Deprivation

The Index of Multiple Deprivation (IMD) provides a measure of relative deprivation across England and was most recently published in 2010. Thurrock is ranked 146th out of 354 councils in England in 2010 (Department for Communities and Local Government, 2014), where one is the most deprived. This is an increase from 2007, where Thurrock was 124th. Pockets of deprivation are evident in some wards, with the most deprived being Tilbury St Chads, Grays, Belhus, Chadwell St Mary, Ockendon and West Thurrock (Thurrock Council, 2011b) (Figure 4-10). These areas represent 12% of Thurrock's population. Although deprivation is lower than average, about 22% (7,500) children live in poverty (Public Health England, 2014).

Over 16% of Thurrock's working age population have no qualifications, compared with 10% nationally.

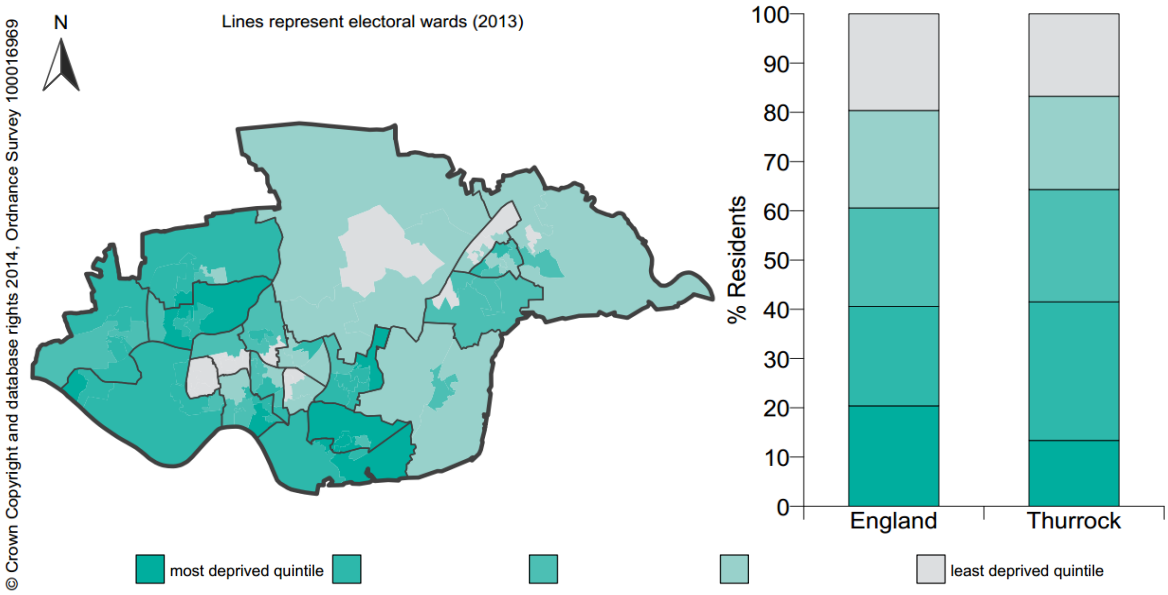

Figure 4-10: Thurrock deprivation (source: Public Health England, 2014). The chart shows the percentage of population in England and Thurrock who live in each of these quintiles.

4.7.3 Key environmental issues

The population of Thurrock is set to increase in the future and is predicted to comprise a significantly larger proportion of older people. The general health of the population is generally good, with increased life expectancy leading towards an ageing population. Health levels do vary across the borough, with poorer health linked to areas of higher social deprivation.

The growing population will have a substantial need for further housing and improved social, green and transportation infrastructure, as well as increased demand for water. Pressure on this infrastructure also arises from increased flood risk.

This growing population will place increased demand on a range of resources and the borough's water and sewerage infrastructure, which could be exacerbated by the effects of climate change. Linked to this may be increased demands for development and pressure on the existing housing provision, which may result in greater need for development in areas at risk of flooding.

4.8 Material assets

4.8.1 Economy

Historically, Thurrock was prosperous due to its riverfront, which became a strategic point for trade and industry. The decline in traditional industry has affected Thurrock, but regeneration, such as Thames Gateway, is presenting more opportunities (Thurrock Council, 2011b). Thurrock is within the Thames Gateway, which is the biggest of four growth areas outlined in the UK Government's Communities Plan 'Building for the Future', launched in 2003 (Thurrock Council, 2011a). The Thames Gateway is a national priority area for social and economic regeneration.

The employment rate for working age residents of Thurrock for 2008/2009 was 74.6%, which is in line with regional and national rates. Employment in Thurrock was projected to fall slightly between 2008 and 2013, but grow over the ten year period to 2018 (Thurrock Council, 2011b). In 2008, Thurrock had a distinctive jobs profile, with distribution, hotels and restaurants (including retail) providing almost 29% of employment in Thurrock. Public administration, education and health account for the second largest proportion with over 22%.

In 2012, the jobs profile had changed significantly with distribution, hotels and restaurants (including retail) provided almost 40% of employment, primarily due to the distribution functions centred at Tilbury and the retail located at Lakeside. There are 16.6% of people employed in public administration, education and health (URS, 2013).

4.8.2 Infrastructure

Thurrock occupies a strategic position in the East of England and enjoys good transport access to London (Figure 4-11). The M25 motorway and A13 road act as strategic cross roads 'of national importance' (Thurrock Council, 2011a). Regular rail services operate between London and Southend on Sea, serving seven stations and the Channel Tunnel Rail Link also passes through Thurrock. The Port of Tilbury provides international connections for both passengers and freight. Waste sites and utility services are also importance infrastructure within the borough, to which there is a risk of flooding.

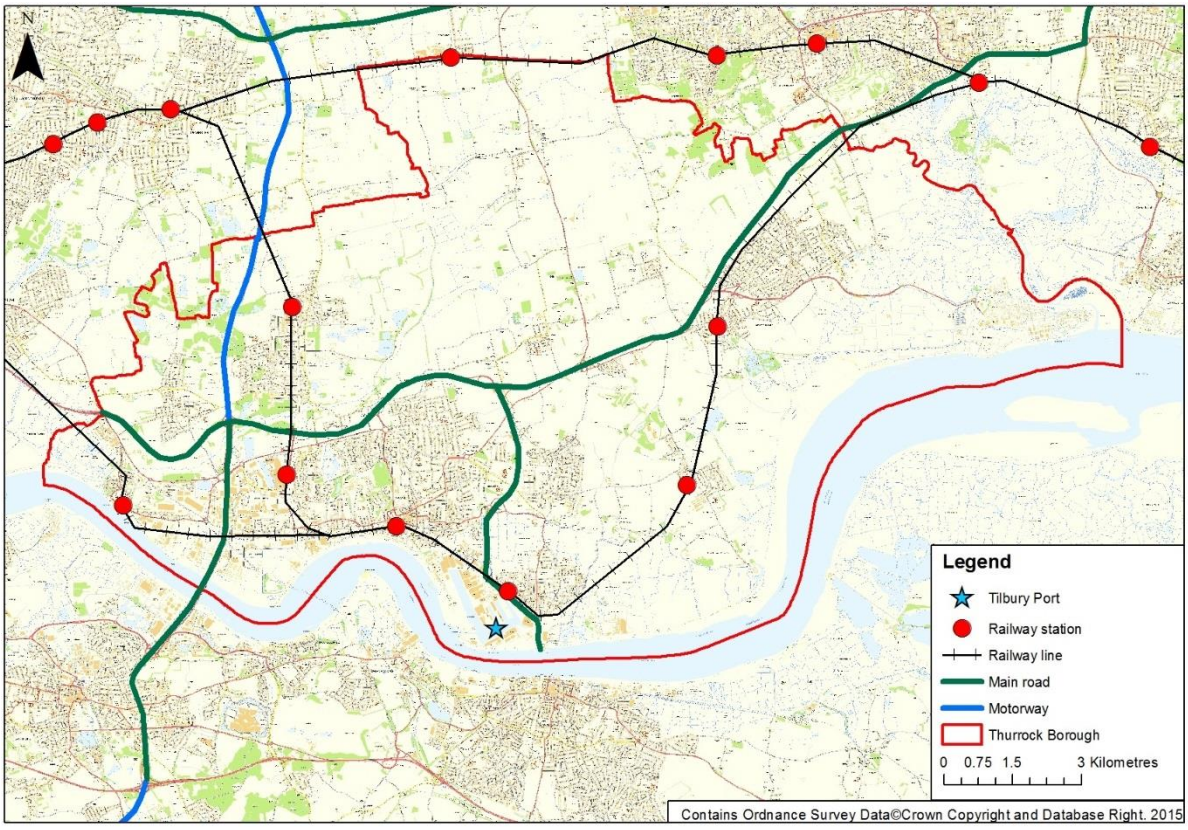

Figure 4-11: Transport infrastructure

4.8.3 Green infrastructure

Thurrock has more than 60% of its land in the Green Belt (Thurrock Council, 2011a). In 2007/8, only 59% of residents were satisfied with parks and open spaces in the borough, however, in March 2011 the area of green space was 515.9ha, compared to 80.9ha in 2010 (URS, 2013).

The South Essex Green Grid Strategy, which aims to create five green infrastructure projects in South Essex, includes the Thurrock Thameside Nature Park. Footpaths and cycleways are present in the park, which currently has an area of 49ha, although this will expand to 342ha once complete, likely to be 2016 (Essex Wildlife Trust, 2014b).

4.8.4 Key environmental issues:

The borough has good internal and external transport links, with further improvements planned. Predicted population increases and an ageing population will place greater pressure on the transport network, which could be exacerbated by an increase in future development pressure. In addition, development and commercial pressures are set to place increased demand on land availability, which will in turn affect the existing transport network.

The effects of a changing climate are predicted to result in increased disruption to transport infrastructure, waste sites and utilities services. Possible impacts include significant deterioration of road surfaces and reduced capacity of rail network due to hot track conditions (URS, 2013).

In addition, opportunities to create and enhance green infrastructure assets could be incorporated into flood risk management measures implemented as part of the LFRMS.

4.9 Air quality

Thurrock has identified areas where air quality objectives are exceeded, which have been designated air quality management areas (AQMA). There are 15 AQMAs in Thurrock, where air pollution levels from roads, industry and property is monitored. Traffic emissions, especially those from heavy goods vehicles, are the major contributor to poor air quality in most of these areas, despite the presence of large scale industry (Thurrock Council, 2015). These are found in the west of the borough, close to busy roads. These have been declared as a result of heavy traffic, primarily for nitrogen dioxide, with four AQMAs also included for PM_{10} as well (Essex Air, 2011).

Generally, air quality is not improving at the rate at which it was expected, due to increasing numbers of vehicles on the road (Essex Air, 2011).

4.9.1 Key environmental issues

Air quality in Thurrock is poor, particularly along major roads. Greater pressures on air quality may occur in the future through increases in the population of the borough, greater development and increased traffic congestion. This could lead to the designation of additional AQMAs to address local impacts on air quality. However, the LFRMS is not likely to impact on air quality in the borough, and any impacts, such as through increased flood risk management activity, are unlikely to be significant.

4.10 Climate

The climate of Thurrock is one of low rainfall, averaging about 600mm, with evapotranspiration averaging 380mm. Evapotranspiration mostly occurs during the summer months and exceeds rainfall totals over this period. However, winter rainfall and recharge provides the water required to offset this seasonal imbalance (Scott Wilson, 2009a).

Grays experiences a temperate climate with average maximum winter temperatures of eight degrees Celsius (^oC) and minimum winter temperature of 1.6^oC. Average maximum summer temperatures are 22.2^oC, minimum 10.5^oC. On average, winter rainfall in the region is between 36.7mm and 53.8mm, and summer rainfall between 41.1mm and 52.5mm (Met Office, 2015).

The UK Climate Projection (UKCP09) provides probability-based projections of key climate variables, such as temperature and rainfall at a higher geographic resolution than has previously been available. Projections are based on the Intergovernmental Panel on Climate Change's 'business as usual' emissions scenario. UKP09 projects that London's sea level will rise by 8.2cm by 2020 under a low emission scenario, rising to 11.5cm under a high emission scenario (UK Climate Projections, 2014).

Current projections point to significant and more variable temperature and rainfall levels in future, with greater peak temperatures and prolonged hot periods forecast. In general, Essex can expect warmer, wetter winters and hotter and drier summers, with extreme events more frequent. The low-lying land and geographical location on the Thames Estuary makes Essex and Thurrock vulnerable to various natural hazards, such as flooding and drought (Essex County Council, 2014).

Climate changes can affect local flood risk in several ways with impacts depending on local conditions. Wetter winters may increase river flooding with more intense rainfall leading to more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. Rising sea or river levels may also the increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses.

With rainfall frequency and intensity set to significantly increase in the coming decades, the likelihood of river flooding and overwhelming of drains and sewers will rise due increased surface runoff. This in turn will lead to localised flood events and increased erosion. To accommodate the increased likelihood of such events, the LFRMS must implement measures aimed at coping with them.

The LFRMS options, could potentially, both directly and indirectly, lead to an increase in greenhouse gas emissions as a result of construction and maintenance activities. Emissions could be reduced by selecting, sustainable building practices and materials.

4.10.1 Key environmental issues

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If such climate change projections are realised, the adverse risk and impact toward Thurrock's infrastructure, public health and the natural environment has the potential to be great. With regard to the natural environment changing climate, mainly that of changing temperatures poses the biggest threat. Species and habitat abundance and richness will become threatened as a result of changing habitats, drier soils and increased competition from non-native invasive species throughout the borough's watercourses. Particularly vulnerable to climate change is the borough's wetland habitats, which are protected under a range of European designations.

Flooding derived from increased rainfall and storm events of greater severity is expected to result in significant adverse impacts on utility, residential and transport infrastructure with subsequent economic consequences. Damage to infrastructure at the forecasted extent will inevitably incur large economic costs as well as social and public health implications as a result of the distress and risk to disruption caused.

The LFRMS options, could potentially, both directly and indirectly, lead to an increase in greenhouse gas emissions as a result of construction and maintenance activities. Emissions could be reduced by selecting, sustainable building practices and materials that benefit flood risk and carbon emissions.

4.11 Scoping conclusion

Following a review of this environmental baseline data it was possible to scope out air quality as an SEA issue as it is unlikely that there will be a significant environmental impact on air quality in the borough from implementation of the LFRMS. A summary of the scoping conclusions are given in Table 4-4 below.

Table 4-4: SEA scoping assessment summary

Receptor	Scoped In / Out	Conclusion
Landscape and visual amenity	Scoped in	The landscape qualities and integrity of the borough could be affected by changes to flood risk or land use/management, including new development, whilst increased flood risk could impact on locally important urban and rural landscapes and landscape features. Flood risk management could potentially impact on local landscape features, potentially within the rural areas and other locally important landscape areas.
Biodiversity, flora and fauna	Scoped in	National and locally important biodiversity sites and species within the Borough, including SPA, Ramsar, SSSI, LNR and BAP habitats and species may be affected by the water environment and flooding. There is one SPA and Ramsar, a number of SSSIs and LNRs within Thurrock at risk from flooding or are water dependent. Future incidences of flooding could potentially change the underlying nature of habitats and the LFRMS policies may present opportunities for biodiversity gain. LFRMS measures could improve the river channel by removal of blockages, which would be of benefit to fish passage. Habitat creation or enhancement could also be incorporated into LFRMS measures, for example through the implementation of more natural flood risk management measures.
Water environment	Scoped in	Flooding has the potential to impact on water availability, the water quality of the watercourses within the borough and WFD objectives. There is the potential for indirect impacts on water dependent designated sites/species. Flood risk management measures could potentially affect the water environment both positively and negatively. The LFRMS could give rise to changes in flood risk and water quality, and could affect provision of water resources.
Soils and geology	Scoped in	Changes to flood risk could affect soil quality and underlying geology, which supports six geological SSSIs. Subsequent erosion of these lands could give rise to pollution pathways, increasing the risk of an adverse effect on other environmental receptors. Thurrock contains a significant percentage of high grade agricultural land. Flooding has the potential to erode soils and cause waterlogging impacting on agricultural productivity. Impacts on soil quality could then affect other aspects of the environment such as biodiversity and water quality.

Receptor	Scoped In / Out	Conclusion
Historic environment	**Scoped in**	Changes to flood risk could have positive or negative impacts on historic sites including scheduled monuments and listed buildings. This includes damage to the fabric of the structures through waterlogging or drought and impacts on their historic value or setting. There are a large number of historic assets in the borough that could be affected by changes to flooding and flood risk management measures. Opportunities may exist to protect important sites or negative impacts could occur due to increased flood risk to vulnerable sites.
Population	Scoped in	A range of socio-economic characteristics of the borough including social deprivation levels, health and wellbeing, access and recreation, and employment opportunities influence vulnerability to flooding. Critical social infrastructure, including hospitals, schools, and residential and nursing homes could benefit from reduced flood risk. The LFRMS has the potential to provide significant positive benefits to the population of the borough through reduced levels of flood risk to population generally and also vulnerable groups, and increased community resilience.
Material assets	Scoped in	Critical infrastructure including the transport network, waste sites, utilities services and emergency services could benefit from reduced flood risk. Conversely, increased flood risk to these sites could cause significant disruption to the borough, impacting on human and economic activity and the environment. Material assets could benefit from reduced flood risk, but the borough could be significantly affected by increased flood risk to these assets.
Air quality	Scoped out	The LFRMS is not likely to have a significant effect on air quality in the borough due to the localised nature of any potential impacts.
Climate	Scoped in	Changes in flood risk could affect resilience to the potential impacts of future climate change. This could have knock-on effects on a range of environmental aspects including biodiversity, water resources and the local landscape. Flood risk management measures could also result in increased carbon emissions associated with new development or increased management activities. The LFRMS may include mitigation, resilience and adaption responses and measures that could contribute to addressing the future impacts of climate change effects. Opportunities to improve climate change adaptation will be considered in the SEA.

4.12 Habitats Regulations Assessment

Thurrock does support one SPA and Ramsar site; the Thames Estuary and Marshes. There are also six more European sites within 15km of the borough boundary:

- Benfleet and Southend Marshes SPA and Ramsar
- Medway Estuary and Marshes SPA and Ramsar
- Crouch and Roach Estuaries SPA and Ramsar
- North Downs Woodlands SAC
- Peters Pit SAC
- Essex Estuaries SAC

More detail on the European sites is provided in Section 4.3.1.

Due to the presence of a European site within the borough, a Test of Likely Significant Effect (Screening Assessment) is required in accordance with the requirements of the Habitats Regulations to determine whether the LFRMS is likely to adversely affect the integrity of a European site (alone or in combination).

All European sites lying partially or wholly within 15km of the Borough boundary will be included in the assessment in order to address the fact that measures in the Thurrock LFRMS may affect European sites which are located outside the administrative boundary of the strategy.

5 SEA framework

5.1 Introduction

The SEA framework is used to identify and evaluate the potential environmental issues associated with the implementation of the LFRMS. The framework comprises a set of SEA objectives that have been developed to reflect the key environmental issues identified through the baseline information review. These objectives are supported by a series of indicators, which are used as a means to measure the potential significance of the environmental issues and can also be used to monitor implementation of the LFRMS objectives. These LFRMS objectives are tested against the SEA framework to identify whether each option will support or inhibit achievement of each objective.

Table 5-1 below summarises the purpose and requirements of the SEA objectives and indicators.

Table 5-1: Definition of SEA objectives, indicators and targets

	Purpose
Objective	Provide a benchmark 'intention' against which environmental effects of the plan can be tested. They need to be fit-for-purpose.
Indicator	Provide a means of measuring the progress towards achieving the environmental objectives over time. They need to be measurable and relevant and ideally rely on existing monitoring networks.

5.2 SEA objectives and indicators

SEA objectives and indicators have been compiled for each of the environmental receptors (Table 5-2) (or groups of environmental receptors) scoped into the study during this phase of the project (see Table 4-4). These objectives are currently in draft form and can be refined or revised in response to comments received during the consultation phase on this SEA Scoping Report and in light of any additional information obtained during the life of the project.

Table 5-2: SEA objectives and indicators

Receptor	Objective		Indicator
Landscape	1	Protect the integrity of the Borough's urban and rural landscapes, and promote the key characteristics of the SLAs and Green Belt.	Changes in the condition and extent of existing characteristic elements of the landscape. The condition and quality of new characteristics introduced to the environment. Percentage of open countryside.
Biodiversity, flora and fauna	2	Protect and enhance designated and BAP habitats and species in the borough.	Area of designated sites adversely affected by flooding. Monitoring of reported status of designated nature conservation sites. Percentage of land designated as nature conservation sites as a result of LFRMS measures. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.
	3	Maintain and enhance habitat connectivity and wildlife corridors within the borough.	
	4	Maintain existing, and where possible create new, riverine and estuarine habitat to benefit migratory and aquatic species and fisheries, and maintain upstream access.	
Water environment	5	Improve the quality and quantity of the water in the borough's rivers.	Water quality of the borough's watercourses. Number of pollution incidents. Number of SuDS schemes installed as part of the LFRMS. Number and volume of Environment Agency licensed abstractions. Numbers of sites with high pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding.
	6	Do not inhibit achievement of the WFD objectives and contribute to their achievement where possible.	Achievement of WFD objectives. Percentage of water bodies achieving 'Good' ecological status/potential. No deterioration in WFD status.

Receptor	Objective		Indicator
Soils and geology	7	Reduce the risk of soil erosion and pollution.	Area of agricultural, rural and greenfield land affected by flooding or LFRMS measures. Numbers of sites with high pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding.
Historic environment	8	Preserve and where possible enhance important historic and cultural sites in the borough.	Number of historic assets at risk from flooding, and assessment of impact. Number of vulnerable historic assets protected from flooding by implementation of the LFRMS.
Population	9	Minimise the risk of flooding to communities and social infrastructure.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding.
	10	Increase the use of SuDS, particularly in all new developments.	Number of SuDS schemes installed as part of the LFRMS.
Material assets	11	Minimise the impacts of flooding to the borough's transport network and key critical infrastructure.	Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding.
Climate	12	Reduce vulnerability to climate change impacts and promote measures to enable adaptation to climate change impacts.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.

5.3 Impact significance

The unmitigated impacts of the LFRMS objectives on achieving the SEA objectives will be identified through the analysis of the baseline environmental conditions and use of professional judgement. The significance of effects will be scored using the five point scale summarised in Table 5-3. If there is high uncertainty regarding the likelihood and potential significance of an impact (either positive or negative), it will be scored as uncertain.

Table 5-3: Impact significance key

Impact significance	Impact symbol
Significant positive impact	++
Minor positive impact	+
Neutral impact	0
Minor negative impact	-
Significant negative impact	--
Uncertain impact	?

5.4 SEA assessment approach

5.4.1 Developing Alternatives

The SEA Directive requires an assessment of the plan and its 'reasonable alternatives'. In order to assess reasonable alternatives, different strategy options for delivering the LFRMS will be developed and assessed at a strategic level against the above SEA objectives and environmental baseline as detailed in Section 4. The results of this assessment will be used to inform the decision-making process in choosing a preferred way of delivering the LFRMS.

The LFRMS objectives and measures (in SEA terms called ‘alternative options’) are not yet sufficiently developed to detail in this scoping report. However, they will be assessed at a later stage, with details of each provided in the Environmental Report.

The SEA will also consider a 'do nothing' scenario (i.e. how the situation would develop in relation to each environmental receptor without implementation of the LFRMS).

5.4.2 Assessment Approach

The LFRMS measures will be evaluated in light of its potential cumulative, synergistic and indirect environmental effects on the different SEA receptors selected for further assessment (see Table 4-4). The assessment of these environmental effects will be informed by the baseline data collected at this scoping stage, professional judgement and experience with other flood risk related SEAs, as well as an assessment of national, regional and local trends. In some cases, the assessment will draw upon mapping data and GIS to identify areas of potential pressure, for example due to flood risk or presence of environmental designations.

Throughout the assessment the following will apply:

- Positive, neutral and negative impacts will be assessed, with uncertain impacts highlighted.
- The duration of the impact will be considered over the short, medium and long term.
- The reversibility and permanence of the impact will be assessed (e.g. temporary construction impacts, impacts which can be mitigated against/restored over time or completely irreversible changes to the environment).
- In-combination effects will also be considered.

The significance of effects upon each of the SEA objectives will then be evaluated and used to inform option selection.

6 Next steps in the SEA process

6.1 Consultation

A key aspect of the SEA process is consultation (See Table 2-1 stage A5), which is also a requirement under Article 10 (1) and (2) of the Floods Directive. The SEA process provides a mechanism to ensure that stakeholder engagement requirements are achieved by providing interested parties/organisations and the public an opportunity to inform the process and comment on decisions taken. Stakeholder engagement also ensures that environmental and social issues, constraints and opportunities are identified and assessed at an early stage of the project. The Scoping Report will be subject to a five week consultation period, after which the comments received will be taken into account in the Environmental Report. The Environmental Report will be the next output in the SEA process and it will document the assessment of the LFRMS against the SEA objectives.

6.2 The Environmental Report

Following the consultation period on the SEA Scoping Report, the LFRMS will be developed, concurrently with the SEA, following the framework outlined above. The results of this will be summarised in an Environmental Report. A proposed structure for the Environmental Report is outlined below.

Table 6-1: Proposed Structure of the Environmental Report

Section	Information to be included
Non-technical summary	• Non-technical summary of the SEA process
Methodology	• Who carried out the SEA, how, who was consulted, and when • Difficulties in collecting data or assessment
Background	• Purpose of the SEA and integration with LFRMS objectives
Environmental baseline	• Baseline environmental data, including the future baseline without the plan. This will be updated from the Scoping Stage with information brought to light during the consultation period. • Links to other plans, programmes and relevant environmental protection objectives, and how they have been incorporated • Existing and foreseeable future environmental problems • Limitations of the data, assumptions etc.
SEA objectives, baseline and context	• SEA objectives and indicators
Plan issues and alternatives	• Description of significant environmental effects of the strategies • Assessment matrix for each strategy/alternative • How environmental problems were considered in developing the strategies and choosing the preferred alternatives • Other alternatives considered, and why these were rejected • Proposed mitigation and enhancement measures to deliver objectives
Implementation	• Links to project environmental impact assessment, design guidance etc. • Proposals for monitoring and reporting

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URS, 2014. *Surface Water Management Plan,* London: URS.

A Appendix A: Review of policies, plans and programmes

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
International				
EU Sustainable Development Strategy (revised 2006)	Outlines the need for economic growth to support social progress and respect the environment to achieve sustainable development.	The strategy aims to limit climate change and manage natural resources more responsibly, issues which are directly relevant to flood risk. Provides direction for the LFRMS in the managing of natural resources for flood risk	The LFRMS should seek to promote objectives that deliver sustainable FRM and sustainable development.	• Biodiversity, flora and fauna • Water environment
European Biodiversity Strategy to 2020	Outlines strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020.	Aims include the provision of better protection for ecosystems and fish stocks, promotion of green infrastructure and tighter controls on invasive alien species.	The LFRMS may contribute to the aims of the strategy through the provision of new green infrastructure to manage flood risk. In contrast, the strategy may limit certain FRM objectives if they are shown to be likely to adversely affect biodiversity or ecosystem services.	• Biodiversity, flora and fauna
EC Birds Directive – Council Directive 2009/147/EEC on the conservation of wild birds	Provides for protection of all naturally occurring wild bird species and their habitats, with particular protection of rare species.	Designates Special Protection Areas (SPAs) to protect birds and their habitats. The LFRMS objectives should avoid any significant adverse effect on these sites and supporting features. Requires LFRMS to be assessed for potential impact.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on a SPA.	• Biodiversity, flora and fauna
EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks	Aims to reduce and manage the risk of flooding and associated impacts on the environment, human health, heritage and economy. Principle requirement is the preparation of FRM plans at River Basin District level, together with preliminary flood risk assessments and hazard/risk maps.	Provides strategic direction to reduce impacts of flooding and promote enhanced FRM. The LFRMS will need to demonstrate compliance with the requirements of the Directive.	None likely as the LFRMS will seek to contribute to achieving the Directive.	• Water environment • Climate
EU Groundwater Directive – Directive 2006/118/EC on the protection of groundwater against pollution and deterioration	Establishes a regime that sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater. Implemented in the UK through the Environmental Permitting Regulations (2010).	Water quality is relevant to the LFRM as flooding is linked to water pollution and a reduction in surface water and groundwater quality.	Improved FRM may benefit groundwater quality by reducing the risk of water pollution during a flood event. LFRMS objectives would need to consider potential impacts on groundwater and may be restricted if they contribute to an adverse impact.	• Water environment

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
EC Habitats Directive – Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora	Principle aim is to promote the maintenance of biodiversity by requiring Member States to take measures to restore habitats and species to favourable conservation status. Introduces robust protection for habitats and species of European importance. Enables the creation of Special Areas of Conservation (SACs) in order to establish a coherent ecological network of protected sites. Encourages protection and management of flora and fauna and supporting landscapes through planning and development policies.	Designates SACs to protect and promote biodiversity. The LFRMS objectives should avoid any significant adverse effect on these sites and supporting features. Requires LFRMS to be assessed for potential impact.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on a SAC.	• Biodiversity, flora and fauna
Urban Wastewater Treatment Directive – Directive 91/271/EEC concerning urban waste water treatment	Aims to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.	Defines requirements for the collection and treatment of waste water in line with the population equivalent. LFRMS would need to consider potential impact of FRM objectives on water treatment sites.	The LFRMS could support the aims of the Directive by reducing the risk of flooding to water treatment sites. However, LFRMS objectives may be restricted if they are shown to be likely to effect on wastewater discharges during flood events.	• Water environment
EU Water Framework Directive – Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy	Establishes framework for protection of inland surface waters, transitional waters, coastal waters and groundwater to prevent pollution, promote sustainable water use, protect the aquatic environment, improve the status of aquatic ecosystems and mitigate the effects of floods and droughts.	Member states must prepare River Basin Management Plans and programme of measures for each River Basin District that sets out a timetable approach to achieving the WFD objectives. Places requirements on all relevant authorities to ensure their actions do not contravene the objectives of the Directive.	May restrict certain FRM options if likely to inhibit achievement of WFD objectives and detailed programme of measures. FRM options may be strengthened if they actively contribute to meeting the WFD requirements.	• Biodiversity, flora and fauna • Water environment
National				
Securing the Future – the UK Government Sustainable Development Strategy (2005)	Establishes a broad set of actions and priorities to support the achievement of sustainable development. It includes measures to enable and encourage behaviour change, measures to engage people, and ways in which the Government can promote sustainability.	Includes high level aims to promote sustainable development and sets out how local authorities can contribute to delivering this and the improvement of the local environment.	The LFRMS can contribute to sustainable development through the promotion of better FRM to benefit people, the economy and the environment.	• Population • Material assets
Flood and Water Management Act (2010)	Designates Lead Local Flood Authorities (LLFAs) who *'must develop, maintain, apply and monitor a strategy for flood risk management in its area'*. Applies to ordinary watercourses, surface runoff and groundwater.	Provides key driver for production of LFRMS and sets strategic direction.	None	• Water environment • Climate
Flood Risk Regulations (2009)	Implements the requirements of the EU Floods Directive, which aims to manage the risk of flooding and associated socio-economic and environmental impacts. Requires LLFAs to manage flooding from surface runoff.	Key driver for implementing FRM strategies at the local level.	None	• Water environment • Climate

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Water for People and the Environment, Water Resources Strategy for England and Wales (2009)	Sets out the approach to sustainable water resources management throughout England and Wales to 2050 and beyond to ensure that there will be sufficient water for people and the environment.	FRM measures are linked to wider water resources management issues and both aspects can actively contribute to achieving corresponding objectives.	None	• Water environment • Population • Climate
Future Water, The Government's water strategy for England (2008)	Future Water defines future objectives for the water sector by 2030 and implementation steps on achieving the objectives. It includes objectives to reduce flood risk from rivers and the coast; improve the sustainable delivery of water supplies; improve the quality of the water environment through greater protection; and more effective management of surface water , which includes the promotion of SuDS, water reuse and above-ground storage;	The strategy includes provisions that seek to better manage surface water drainage and reduce flood risk, and the LFRMS could actively contribute to achieving these objectives.	The strategy promotes greater protection of the water environment, reduced water pollution and enhanced ecological quality of watercourses. The strategy may restrict certain FRM options if they are likely to inhibit achievement of these wider environmental objectives.	• Water environment
Making Space for Water – taking forward a new Government strategy for flood and coastal erosion risk management in England (2005)	Aims to provide strategic direction to deliver sufficient space for water and enable more effective management of coastal erosion and flooding to benefit both people and the economy. The aim being to address these issues to mitigate their impact and to achieve environmental and social benefits.	National guidance regarding FRM is directly relevant to the LFRMS. The LFRMS can contribute to its aims, including promoting greater land management and land use planning, and integrated urban drainage management.	None	• Water environment • Population • Climate
The National Flood and Coastal Erosion Risk Management Strategy for England (2011)	Provides strategic direction to manage and monitor flood and coastal erosion risks in England. It sets out responsibilities of different organisations including local authorities to reduce risks and sets out the requirements for LLFAs to develop LFRMS.	Key driver for implementing FRM strategies at the local level.	None	• Water environment • Population • Climate
Water Act (2003)	Sets out the framework for abstraction licensing, impoundments, water quality standards and pollution control measures, and includes measures for drought management and flood defence work in England and Wales.	FRM is one of the themes addressed by the LFRMS.	The strategy promotes greater protection of water resources and may restrict LFRMS objectives if they are likely to adversely affect water quality or sustainable resource management.	• Water environment
Draft Water Bill (2012)	Emerging national strategy aimed at improved regulation of the water industry, whilst increasing its resilience to natural hazards such as drought and floods. It includes provisions to better manage sustainable water abstraction and encourage the use of SuDS.	Aims to promote better management of water resources and reduce the risks of flooding.	The strategy promotes greater protection of water resources and may restrict LFRMS objectives if they are likely to adversely affect water quality or sustainable resource management.	• Water environment
The National Flood Emergency Framework for England (2011)	Sets out a strategic approach to emergency response planning to reduce the impacts of flooding and improve resilience.	The framework sets out organisational responsibilities and promotes a multi-agency approach to managing flooding events.	None	• Water environment
The Carbon Plan (2011)	The carbon plan sets out a vision for Britain powered by cleaner energy used more efficiently, with more secure energy supplies and stable energy prices and benefits from jobs and growth that	Carbon emissions, and the resulting climate change impacts, are highly relevant to the	None	• Climate change

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
	a low carbon economy will bring. Key areas are electricity generation, eating homes and businesses and travel.	issue of FRM due to the likely increased flood risk resulting from climate change.		
Building a Low Carbon Economy – the UK's Contribution to Tackling Climate Change (2008)	Puts forward a framework for adapting to climate change and associated threats as well as a case for increased resilience to climate change.	Emphasises the commitment to sustainable development and consideration of the potential impacts of climate change, including increased flooding.	The LFRMS may contribute to the aims of the strategy through the provision of measures to adapt to an increase in flood risk due to future climate change.	• Climate change
Climate Change Act (2008)	Establishes a definite target to reduce UK national carbon emissions by 80% by 2050, relative to a 1990 baseline. Requires the government to publish five yearly carbon budgets starting with the period 2008-2012. Sets targets to reduce greenhouse gases, and puts in place funding and mechanisms to reduce and alter activities which contribute to the emission of these gasses.	Emphasises the commitment to sustainable development.	The LFRMS will need to consider the carbon implications of its objectives and should seek to minimise emissions whilst promoting sustainable FRM.	• Climate change
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystems (2011)	Sets out the Government's strategy for improving biodiversity in England up to 2020.	Flooding can have adverse impacts on biodiversity. However there may be opportunities for the LFRMS to provide for biodiversity enhancements, as well as reducing risks to habitats and species from flood events.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse impact on water quality or local biodiversity.	• Biodiversity, flora and fauna • Water environment
England Biodiversity Framework (2008)	The framework encourages a number of conservation aspects including the adoption of an ecosystem approach and to embed climate change adaptation principles in conservation action.	The LFRMS may include measures that would result in biodiversity enhancements across landscapes and restoring / improving habitats.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse impact on water quality or local biodiversity.	• Biodiversity, flora and fauna • Water environment
UK Biodiversity Action Plan (1994)	The UK BAP aims to maintain and enhance biological diversity within the UK and contribute to the conservation and enhancement of global diversity.	The LFRMS will need to consider the potential impacts of measures within it on important species and habitats that are within the District, including the various Sites of Special Scientific Interest.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse impact on water quality or local biodiversity.	• Biodiversity, flora and fauna • Water environment
National Wetland Vision (2008)	The Wetland Vision is of a future where wetlands are a significant feature of the landscape in which wildlife can flourish. It will be a future in which wetland heritage is recognised and safeguarded; where everyone can enjoy wetlands for quiet recreation and tranquillity. Vitally, it will be a future where wetlands are valued both for the roles they play in helping us deal with some of the challenges of the 21st century and in improving and sustaining our quality of life.	Preserving and restoring wetlands such as peatlands, rivers and lakes will help regulate surface water run-off, store flood water and recharge groundwaters. These actions that are part of the wetland vision could potentially link with measures within the LFRMS.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on wetland habitats within the Borough.	• Biodiversity, flora and fauna • Water environment

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Wildlife and Countryside Act (as amended) (1981)	The Act is the principle mechanism for legislative protect of wildlife in Great Britain. The Act deals with the protection of birds, other animals and plants.	The Act provides for the notification of Sites of Special Scientific Interest and their protection and management. Any potential impacts of the LFRMS, including on SSSIs, will need to be considered through the SEA.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on a SSSI.	• Biodiversity, flora and fauna • Water environment
Natural Environment and Rural Communities (NERC) Act (2006)	Provides guidance for the protection and enhancement of important habitat and species.	Requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on priority species or habitats.	• Biodiversity, flora and fauna • Water environment
Salmon and Freshwater Fisheries Act (1975)	Aims to regulate practice relating to freshwater fisheries and salmon fishing.	The Act's main purpose is to protect fish species. However, it does indirectly affect flood risk. Restricting the obstruction to passage of fish may have implications for flood risk, as this will prohibit the use of fish weirs and mill dams.	May restrict certain FRM objectives if they are shown to be likely to have an adverse effect on fish passage or compromise a waterbody from achieving Good status under the WFD.	• Biodiversity, flora and fauna • Water environment
Contaminated Land (England) Regulations (2006)	Sets out provisions relating to the identification and remediation of contaminated land. The regulations identify contaminated land issues and pathways to pollution of surface, ground, estuarine and coastal water environments.	Although there is no heavy industry in Bromley, other light industries may have contaminated the land.	Flooding of contaminated land can have adverse impacts on factors such as biodiversity, water and soils	• Biodiversity, flora and fauna • Water environment • Soils
National Planning Policy Framework (2012)	The National Planning Policy Framework (NPPF) has replaced the set of national planning policy statements and national planning policy guidance notes, bringing them into one document. It sets high level national economic, environmental and social planning policy and includes a new presumption in favour of sustainable development.	The NPPF has replaced PPS25 along with the other PPSs and PPGs, and so comprises the national policy framework in relation to planning in areas of higher flood risk. The NPPF restricts development that would adversely affect sites European sites, designated sites, including Green Belt, Sites of Special Scientific Interest (SSSIs) and Areas of Outstanding Natural Beauty (AONB), as well as locations at risk of flooding or coastal erosion.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse effect on sensitive ecological and landscape sites in the Borough.	• Biodiversity, flora and fauna • Water environment • Landscape • Historic environment • Population • Soils
PPS5: Planning for the Historic Environment Practice Guide (2010)	The guide assists local authorities, owners, applicants and other interested parties in implementing the policy *Planning Policy Statement 5 (Planning for the Historic Environment)*.	Provides guidance on how to conserve historic assets. This will provide advice on how to develop around historic assets, as well as ways best to conserve them from flooding.	May restrict certain FRM objectives if they are shown to be likely to have an adverse effect on historic assets in the Borough.	• Historic environment.

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Historic Environment Good Practice Advice in Planning: Historic Environment Records (2014)	Provides information on good practice to assist local authorities, planning and other consultants, owners, applicants and other interested parties in implementing historic environment policy in the NPPF. Assists with access to Historic Environment Records.	Guide helps to assist in sustainable development, in helping with access to Historic Environment Records which has information about various historic assets.	None.	• Historic environment
Historic Environment Good Practice Advice Guide in Planning: Note 3: The Setting of Heritage Assets.	Provides information on good practice to assist local authorities, planning and other consultants, owners, applicants and other interested parties in implementing historic environment policy in the NPPF. Provides advice on the setting of historic assets, and how to understand the setting.	Understanding the setting of a historic assets will assist in design development of FRM measures.	May restrict certain FRM objectives if they are shown to be likely to have an adverse effect on historic assets in the Borough.	• Historic environment
Regional / Local				
Thames Catchment Flood Management Plan (2009)	The CFMP provides an overview of the flood risk in these catchments and set out the preferred surface water management strategy for future years. They outline the wider context for managing flood risk in London.	The CFMP provides important context for the LFRMS and set the strategic direction for managing flood risk from main rivers.	None	• Water environment
Thames Estuary 2100 Strategy (2002)	Provides recommendations for FRM for London and the Thames Estuary.	Provide important context for the LFRMS.	None	• Water environment
Thames Gateway Delivery Plan (2009)	Europe's largest regeneration project, which stretches along the Thames Estuary. The plan provides a structure for positive change in the area, a strong economy, improvements in quality of life and development of the Gateway as an eco-region.	Developing an eco-region could include water courses and wetland areas.	The LFRMS will need to consider development policies set out in the plan. May restrict certain FRM options if likely to inhibit achievement of the strategy objectives.	• All
Managing Water Resources & Flood Risk in the South East (2005)	Provides levels of strategic assessment of flood risk across the region.	Provide broad context for the LFRMS.	None	• Water environment
London Rivers Action Plan (2009)	A tool to help restore rivers for people and nature. Provides guidance regarding improving the wildlife and amenity value of London rivers. Key aspirations include the improvement of flood management using more natural processes; reducing the likely negative impacts of climate change; reconnecting people to the natural environment through urban regeneration; and enhancing habitats for wildlife.	The watercourses within Bromley and surface water flooding are a key feature of the LFRMS.	The LFRMS will need to consider these aspirations in a local context and should seek ways	• Water environment • Biodiversity, flora and fauna
Thames River Basin Management Plan	The Thames River Basin Management Plan (RBMP) has been prepared to meet the requirements of the EU Water Framework Directive. It focuses on actions to address the protection, improvement, sustainable use of water and other pressures facing the water environment in the Thames River Basin.	Water quality and quantity is linked to the LFRMS as flooding events can lead to water pollution and changes in water levels.	May restrict certain FRM options if likely to inhibit achievement of WFD objectives and detailed programme of measures. FRM options may be strengthened if they actively contribute to meeting the WFD requirements.	• Water environment

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Thurrock Council Local Air Quality Action Plan (2004)	Details how Thurrock Council intends to improve air quality within its fifteen AQMAs.	Provides information on regional policies to improve air quality in the borough.	None	• Air quality
Thurrock environmental Vision and Policy (2013)	Sets the high level framework for the Council's work to deliver the Community Strategy priority for promoting and protecting our clean and green environment.	Provides information on environmental priorities and vision.	The LFRMS may need to consider environmental policies, which may restrict certain FRM options.	• Biodiversity, flora and fauna • Water environment
Essex County Council Preliminary Flood Risk Assessment (2011)	Provides a high level review of flood risk from surface water, groundwater and ordinary watercourses across the county.	The flood risk assessment provides an important local context for the LFRMS.	None	• Water environment
Thurrock Strategic Flood Risk Assessment Level 1 Report (2009) and Level 2 Report (2010)	Provides a review of flood risk across the borough, steering all development towards areas of lowest risk.	The flood risk assessment provides an important local context for the LFRMS.	None	• Water environment
Thurrock Transport Strategy 2013-2026 (2013)	Sets out the aims, objectives and a series of policies for delivering transport improvements in Thurrock.	Important transport infrastructure may be at risk of flooding and the LFRMS offers potential benefits through better FRM.	None	• Material assets • Population • Air quality
Thurrock Local Development Framework Core Strategy and Policies for Management of Development (2011)	The policies cover spatial development issues in relation to education, health, community safety, energy management, sustainable development, climate change and flood management.	The strategy provides direction for the future development of the Borough, and includes policies relating to flooding.	The LFRMS will need to consider development policies set out in the strategy. May restrict certain FRM options if likely to inhibit achievement of the strategy objectives.	• All
Sustainable Community Strategy Thurrock 2020 (2009)	Sets out how Thurrock will achieve its ambitions of a sustainable community.	The strategy provides direction for the future development of the Borough, particularly regeneration.	The LFRMS will need to consider development policies set out in the strategy.	• All
Essex Biodiversity Action Plan (2011)	Details the priorities for habitats and species and offers practical measures which can be implemented to achieve the conservation of the areas biodiversity heritage. The content of the plan is informed and guided by national targets so that its implementation is firmly linked to national priorities.	Objectives include the improvement of water quality, removal of barriers to aquatic species and enhancement of wetland and riverine habitats and connectivity and the issue of invasive species.	Objectives of the Essex BAP are linked to those of the WFD to enhance biodiversity and improve water quality status.	• Biodiversity, flora and fauna
Thurrock Biodiversity Action Plan 2007-2012	Identifies key biodiversity habitats and species for Thurrock and aims to raise awareness, outline an action programme and encourage developers to integrate biodiversity.	Objectives include maintain existing areas of habitats and to ensure habitats are managed and maintained.	Objectives of the Thurrock BAP are linked to WFD measures to enhance biodiversity.	• Biodiversity, flora and fauna.
Essex County Council Adapting for Climate Change – Action Plan (2014)	Highlights the types of severe climatic events possible in the future and the impact these could have on services. Sets out measures to adapt and build resilience to these types of events.	FRM actions can contribute to the provision of adaptation measures to benefit people and biodiversity. FRM activities will generate carbon emissions.	The LFRMS will need to demonstrate that it can deliver improved FRM whilst minimising the level of associated carbon dioxide emissions.	• Climate

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Open Spaces Strategy 2006 – 2011 (2006)	Thames Gateway is a key growth area which is seeking significant improvement to the quality of life for present and future communities, where providing open space is a key element.	Provides a broad context to aims to increase and enhance open spaces within the borough. The LFRMS provides an opportunity to contribute to the objectives of the plan.	Protects amenity value of public open spaces.	• Human Health • Socio-economic • Biodiversity flora and fauna
Riverscapes – An environmental vision for Thurrock 2013-2023 (2013)	Outlines Thurrock's approach to improve the borough's riverside landscapes and surrounding environment, based on the notion that the natural environment needs to connect and function as a whole system.	Provides direction in how riversides should be managed, with an aim to increase biodiversity and connectivity.	The LFRMS will need to demonstrate that it can deliver improved FRM whilst not damaging the visions set out in this strategy.	• Biodiversity, flora and fauna • Water environment

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Our ref CCE/2015/55140

Date 16 April 2015

Dear Mr Stevens

Enquiry regarding Thurrock LFRMS SEA Scoping Report

Thank you for sending the SEA Scoping report on 19 March. We have gathered comments from on the report and they are as follows.

We are pleased to note that Biodiversity, Flora & Fauna, Water Environment, Soils & Geology and Climate Change have all been scoped into the Strategic Environmental Assessment. We note that Flood Risk, Water Resources and Water Quality are all considered within the 'Water Environment' section.

Table 3-2 on page 8, under 'Water Environment', states a key theme to be "better regulation and management of the water environment to benefit water resources and flood risk, and reduce water pollution". We suggest the wording 'and improve water quality' rather than 'reduce water pollution'. The aim should be not only to reduce pollution, but also to promote multifunctional land use, for example for river corridor improvements that can provide flood protection and help towards achieving Water Framework Directive objectives.

We are happy that the report has considered WFD, protected species, BAP species and designated sites. We are concerned that there is no mention of invasive species and the detrimental effects caused by their introduction to the environment and spread along the river network. For example, floating pennywort has been reported from a watercourse in Tilbury and last year we removed a significant amount of the plant from the river.

We believe that the SEA should include a short section on reducing the incidence and spread of invasive plant and animal species, which is a legal requirement for species designated under the Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England and Wales) Order SI 2010/609.

This amends the Wildlife and Countryside Act 1981 by adding new species to the list of plants not to be planted or allowed to grow in the wild, including Himalayan balsam, floating pennywort and cotoneaster. You can find more information on this issue on the link here: https://www.gov.uk/japanese-knotweed-giant-hogweed-and-other-invasive-plants

Doc Ref	Comment
Table 3-1 pg. 7	Reference should be made to the following: • Water Act (2014) • South Essex Catchment Flood Management Plan (2009) • Thames Estuary 2100 Plan (2012) **not 2002** • Thurrock Council Surface Water Management Plan (2013) • Thames Flood Risk Management Plan (2015 – Draft)
Section 3.2 Pg. 8	Whilst appendix A is acknowledged, an explanation of how these relevant policies, plans and programmes and their relationship with the Local Flood Risk Management Strategy (LFRMS) should be provided within this section.
Section 4.2 Pg.10	Where referring to "natural low points" in the study area, Tilbury should be referred to given it is prone to surface water flooding for this very reason. This should be reflected in the final LFRMS.
Figure 4-1 Pg.11	Suggest the following: • Label "Purfleet" • Change the legend text to read "Watercourses" rather than "River Network"
Section 4.2.1 Pg. 12	Concerning flood risk management measures and the potential to affect landscape characteristics, we advise that this should be managed via the development of Thurrock Council's proposed Riverside Strategy for the Thames Estuary.
Section 4.4.1 Pg. 22	Refinement of the term "main rivers" in this context is required. If you mean the term "main river" as designated on the main river map held by the Environment Agency, then there are many more than currently referred to in the report. The Thames Estuary is not designated as a "main river" as designated on the main river map held by the Environment Agency for the Thurrock frontage. You should make reference to "Gobians Sewer" not "Gabbions Sewer". Further explanation is required on the sentence "*These are low flow channels with no additional capacity to accept surface water runoff*". How have you derived this statement?

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Section 4.4.5 Pg. 23	There is no differentiation between the numerous sources of flood risk in the study area, nor those that the LFRMS will seek to address (surface water, ordinary watercourse, groundwater). There is no brief outline of the roles and responsibilities under the Flood and Water Management Act 2010, which would be of benefit. Thurrock Council Surface Water Management Plan is not referred to at all, surface water is a significant source of flood risk in low-lying areas of the study area, especially Tilbury and Bulphan. This is arguably the most likely flood risk to people and property, although it is acknowledged that the residual risk of flooding from the Thames Estuary poses the biggest consequence. Key flooding risk areas should be referred to.
Section 4.7 Pg. 27	There is no indication of the percentage of people currently at risk of flooding, for varying sources of flood risk, within the study area, including those in deprived areas. This information should be provided to give greater context.
Section 4.8.2 Pg. 29	No reference is made to the existing FCRM infrastructure within the study area, including condition and status. We recommend reference is made to the Thames Tidal Defences, including Tilbury and Fobbing Barriers and Mardyke Sluice amongst others, as well as the Tilbury Flood Storage Area (FSA). This is key infrastructure required to support the study area. An examination of critical infrastructure within the study area also at flood risk is recommended, considering the impacts of climate change.
Figure 4-11 Pg.29	Detail the location of the FCRM infrastructure as referred to above.
Section 4.10 Pg. 30	Reference to the Thurrock Council Surface Water Management Plan would be beneficial in this section. We also recommend consideration of development planning proposals on floodplain management in line with the National Planning Policy Framework. Our Thames Estuary 2100 plan advocates the following recommendations for the relevant policy units in the study area relevant to this section: • "...a programme of floodplain management including flood warning, emergency planning, and localised flood protection and resilience for vulnerable key sites..." • "...partnership arrangements and principles to ensure that new development in this zone is safe, and flood risk management is factored into the planning process at all levels..."

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Section 4.11 Pg. 31	Update the existing conclusions in line with the recommended changes.
Table 5-2 Pg. 34	Population – 9 : Suggest “Increasing the resilience of people, property and businesses and critical infrastructure within Thurrock to the risk of flooding”
Section 6.1 Pg. 36	Public consultation is encouraged as a means by which to help set the environmental context and determine the scope of assessment.

Section 4.4 – Water Environment and more specifically WFD.

Paragraph 4.4.2 Water Framework Directive:

The report states that most of the Mardyke is not designated as Heavily Modified. Whilst this was correct, a number of changes have been made to waterbodies in the South Essex Catchment as part of the 2nd cycle of the River Basin Management Plan (2015-2021), the draft of which is currently out for consultation and the final plan will be published in December 2015. You can find the consultation documents at the following link: https://www.gov.uk/government/publications/thames-river-basin-management-plan

As part of these changes most of the Mardyke is now designated as Heavily Modified for Flood Protection and the lower Mardyke is also designated for Urbanisation. A number of mitigation measures required to achieve Good Ecological Potential are not in place.

Paragraph 4.4.3 – Surface Water:

This section mentions the Thames Estuary as well as a number of fluvial/freshwater rivers. It concludes that the Thames Estuary is the main watercourse within Thurrock which may be affected by planned growth, because it will receive effluent from Tilbury Sewage Treatment Works. The report also mentions that reduction in flooding could improve water quality, by removing pathways for pollution to enter rivers via floodwater (e.g. from sewage treatment works) However, little consideration is given to hydromorphology and the impact of land use/management and river maintenance on hydromorphology and ultimately ecology. This section seems to focus on chemical water quality and insufficient consideration is given to hydromorphological impacts of modifying and maintaining watercourses, which can have equally significant impacts on ecology and WFD. Fluvial rivers in the catchment could be significantly impacted by flood risk management activities as well as urbanisation/growth and development, so the scope should be increased to consider these aspects as well as water quality impact on the Thames.

As the fluvial rivers and estuaries within this catchment have very different characteristics and pressures, it may be worth considering them separately, with greater attention to hydromorphology as well as the water quality impacts.

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Paragraph 4.4.6 – Key environmental issues:

The SEA states that:

> "The water bodies in Thurrock currently fail to meet good ecological status/potential under the WFD. This is partly due to the installation of structures for flood conveyance and land drainage. The LFRMS will need to consider whether any flood risk management measures will lead to adverse impacts on the watercourses within the borough and whether the LFRMS can help contribute to achieving WFD objectives and improving water quality".

We think it would be worth highlighting that not only the 'installation of structures' which contribute towards the failure to achieve Good Ecological Status. Historical maintenance and modifications to river channels to improve land drainage and flood defence also have a significant impact on the current ecological status of fluvial rivers in the catchment; for example widening, deepening, straightening, re-aligning, silt and vegetation deposits on the bank disconnecting the river from its natural floodplain and extensive removal of bank-side trees in this catchment. Furthermore, current and future maintenance activities, such as improved land drainage, vegetation clearance, de-silting, removing fallen trees from the channel, bank-side tree cutting/removal etc, also have the potential to reduce the ecological status of rivers in the catchment, and prevent rivers from reaching good status.

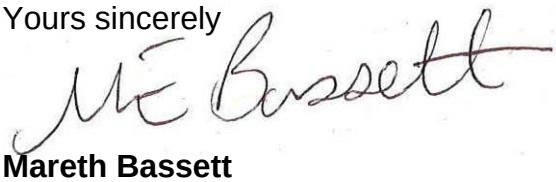
The impacts of land use and river maintenance should be considered in the Local Flood Risk Management Strategy, as the strategy could have a significant effect on both land use and river maintenance undertaken by the Council or landowners/managers, and this in turn could impact on ecological status as well as WFD compliance.

Section 5 – SEA objectives & indicators, Table 5.2, objectives 5 & 6:

Again, the focus of the objectives and indicators is on water quality, with little consideration given to the environmental impact on morphology.

Thank you for taking the time to consult us on this matter and please do contact us if you have any further queries.

Yours sincerely



Mareth Bassett
Customers & Engagement Officer

Customers and Engagement Team
01473 706720

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Historic England

Lee Stevens
Flood Risk Manager
Thurrock Council

By email only

Our ref: HD/P 6042
Your ref:

Telephone 01223 582775

20 April 2015

Dear Mr Stevens

Thurrock Local Flood Risk Management Strategy (LFRMS)

- **Strategic Environmental Assessment Scoping Report**

Thank you for your letter dated 19 March consulting Historic England (formerly English Heritage) on the above report. We would like to make the following comments:

General comments

Historic England recommends that our guidance (2013) on Strategic Environmental Assessment (SEA) / Sustainability Appraisal (SA) and the Historic Environment is used to inform the environmental assessment. The guidance is available via the Historic England website: http://historicengland.org.uk/images-books/publications/strategic-environ-assessment-sustainability-appraisal-historic-environment/. The guidance sets out a series of general principles on the consideration of the historic environment in the assessment process. For each stage of the assessment more detailed advice is provided to help ensure that the impact of a proposed plan/strategy on the historic environment is adequately addressed.

Historic England welcomes the opportunity to engage in the assessment and preparation of the strategy for the following reasons:

- The vulnerability of most heritage assets (designated and non-designated) to flooding, including occasional flooding, and the potential harm to or loss of their significance.
- The potential impact of flood risk management measures on heritage assets and their settings, including impacts on water-related or water-dependent heritage assets.
- The potential impact of changes in groundwater flows and chemistry on preserved organic and palaeo-environmental remains. Where groundwater levels are lowered as a result of measures to reduce flood risk, this may result in the possible

degradation of remains through de-watering, whilst increasing groundwater levels and the effects of re-wetting could also be harmful.

- The potential impact on heritage assets of hydromorphological adaptations. This can include the modification/removal of historic in-channel structures, such as weirs, as well as physical changes to rivers with the potential to impact on archaeological and palaeo-environmental remains.
- The potential implications of flood risk on securing a sustainable use for heritage assets, including their repair and maintenance.
- The opportunities for conserving and enhancing heritage assets as part of an integrated approach to flood risk management and catchment based initiatives, this including sustaining and enhancing the local character and distinctiveness of historic townscapes and landscapes.
- The opportunity for increasing public awareness and understanding of appropriate responses for heritage assets in dealing with the effects of flooding as well as the design of measures for managing flood risk and improving resilience.
- The opportunities for improving access, understanding or enjoyment of the historic environment and heritage assets as part of the design and implementation of flood risk management measures.

Historic England advises that the local authority's conservation and archaeological advisers are involved throughout the preparation, assessment and implementation of the strategy, as they are often best placed to advise on:

- baseline information on the historic environment and heritage assets through the county-based Historic Environment Record (HER);
- the significance of designated and non-designated heritage assets;
- local historic environment issues and priorities, as for example heritage assets vulnerable to the effects flooding and or those that have been harmed by previous flooding events;
- how flood risk management measures can be tailored to avoid or minimise potential adverse impacts on the historic environment;
- the nature and design of any required mitigation measures; and
- opportunities for securing wider benefits for the future conservation, management and enjoyment of heritage assets, whether through the design and implementation of individual measures and schemes and wider catchment management proposals.

The comments set out below supplement our general advice on SEA/SA by outlining specific considerations relevant to flood risk management.

Review of Plans, Policies and Programmes

Historic England advice on SEA/SA recommends that the review includes plans and programmes that have a direct bearing on the historic environment. An indicative list is provided in our SEA guidance of plans and programmes at the international, national, sub-national and local level.

Historic England acknowledges that the current review will concentrate on those policies, plans, programmes that are most relevant to the flood risk management and to the implementation of the strategy. Relevant historic environment considerations, however, should still be fully taken into account in the review as for example:

At the national level:

- The National Planning Policy Framework recognises that the protection and enhancement of the historic environment is integral to achieving sustainable development.
- The Flood Risk Regulations 2009 include a requirement to have regard to the desirability of reducing the adverse consequences of flooding for the environment (including cultural heritage).
- The Flood and Water Management Act 2010 includes a requirement for local authorities, highway agencies and Internal Drainage Boards to contribute towards sustainable development when exercising their flood and coastal erosion risk management functions[1]. Supporting guidance[2] on this duty includes, within its definition of sustainable flood and coastal erosion risk management, improving the resilience of the natural, historic, built and social environment to current and future risks, as well as protecting natural and heritage assets and enhancing the environment where it is most degraded.
- The National Flood and Coastal Erosion Risk Management Strategy for England includes a guiding principle on achieving multiple benefits, such as enhancing and protecting the built, rural and natural environments, cultural heritage and biodiversity and in all instances flood and coastal risk management should avoid damaging the environment, including the historic environment.

At the local level:

- Conservation area appraisals and accompanying management plans, particularly for conservation areas identified as at risk of flooding.

Baseline

In accordance with our guidance on SEA/SA, Historic England recommends that a broad definition of the historic environment is used to establish the baseline. This will include areas, buildings, features and landscapes with statutory protection (designated heritage assets), together with those parts of the historic environment which are locally valued and important (non-designated heritage assets) and also the historic character of the landscape, townscape and seascape. The cultural heritage overview of Thurrock in Section 4.3 of the report is useful, including reference to Heritage at Risk.

Together with our general advice on baseline information and the historic environment, the following data sources can be particularly useful in providing locally specific information, as for example:

[1] The Environment Agency already has a similar duty under the Environment Act 1995

[2] Guidance for risk management authorities on sustainable development in relation to their flood and coastal erosion risk management functions (2011), Defra

- Historic Environment Records: These can be interrogated in various ways, as for example, heritage assets located in identified Flood Risk Areas or river catchments, and or heritage assets associated with rivers and other water-dependent habitats or water-level management regimes (e.g. historic bridges, weirs, mills).
- Preliminary Flood Risk Assessments: These assessments may identify heritage assets as a key site at risk of flooding.
- The character of the historic landscape and townscape and other valued historic landscapes: Historic Characterisation studies such as county based historic landscape characterisations can help to identify surviving water meadows or areas where such historic land management could be reinstated as part of wider catchment management proposals. Urban historic characterisation studies may be useful in providing up-to-date, mapped data on present day land uses and the character of places as well as their historical development, including the historical extent of river floodplains and associated land uses. Such information may be of help informing the location and sensitive design of Sustainable Drainage Systems within the existing urban fabric.

Historic England also recommends that the baseline takes account of areas of archaeological importance and the potential for unrecorded archaeology: This may include buried, waterlogged archaeological and palaeo-environmental remains of significant interest and fragility that can be associated river valleys, floodplains and wetland areas.

Historic England recommends that, wherever possible, data sets are mapped. This will aid the assessment process by helping to identify those heritage assets or groups of assets that may be at most risk from flooding and or potentially impacted by proposed measures to help manage flood risk or improve resilience.

For both designated and non-designated heritage assets, an important consideration is the contribution of their setting to their heritage interest or significance. The significance of a heritage asset can be harmed or lost by development within its setting. New development within the setting of a heritage asset may also offer opportunities for enhancing or better revealing its significance, for example, removing a culvert may serve to improve the character and experience of a historic townscape or landscape.

With regard to heritage assets identified as at risk in the National Heritage at Risk Register or local registers, consideration could be given to screening the records to identify if the at risk status is associated in some way with flood risk and or whether flood risk might exacerbate the problem. For example, this might include whether a conservation area at risk is within a high flood risk area, or whether the sustainable use of a listed building at risk might be hampered by its location in a flood risk area as a result of limitations put on its use or the design solution for its repair and reuse.

Up-to-date information on the National Heritage at Risk Register is available via: http://risk.historicengland.org.uk/register.aspx

Key Environmental Issues

Environmental problems, issues and opportunities affecting the historic environment in the context of the strategy could include the following depending on the local baseline and the nature and prevalence of flood risk.

- Most heritage assets are vulnerable to flooding and a range of heritage assets are likely to be at risk of flooding, which may result in harm to or loss of their significance. This may be as a result of direct flood damage as well as inappropriate remedial works[3].
- Proposed flood risk management measures and measures to improve resilience have the potential to impact on the significance of heritage assets, including the contribution made by their setting.
- Securing the sustainable use of heritage assets, including those identified as at risk, may be hindered by their location in high flood risk areas.
- Accommodating measures such as Sustainable Drainage Systems, whilst sustaining and enhancing the character of historic townscapes and landscapes and the significance of areas of archaeological interest and or potential interest.

We welcome the discussion of key environment issues relating to the historic environment in Section 4.6.1.

SEA Framework

Historic England recommends the SEA assessment framework includes a specific headline objective for the SEA topic on Archaeology and Cultural Heritage, for example:

'Conserve and enhance the historic environment, heritage assets and their settings'

The current draft SEA objective on page 34 of your report could be amended as above.

In addition to the head-line objective, it can also be beneficial for the SEA framework to include relevant sub-objectives (decision-making criteria) to help ensure that all the key heritage issues are considered and potential effects (direct and indirect) appropriately assessed. Examples of decision-making criteria that may be relevant for the strategy include:

- Will the measures reduce the number of heritage assets at risk of flooding?
- Will the measures harm the significance of designated and non-designated heritage assets, including their setting?
- Will the measures help secure the sustainable use of a heritage asset and or improve its maintenance?
- Will the measures lead to changes in groundwater levels or chemistry that could alter the hydrological setting of water-dependent heritage assets, including palaeo-environmental deposits?

[3] English Heritage (2010) Flooding and Historic Buildings https://www.historicengland.org.uk/images-books/publications/flooding-and-historic-buildings/

- Will the measures involve hydromorphological adaptations comprising the modification/removal of weirs or other in-channel structures and physical changes to rivers including de-canalisation or re-cutting old meanders?
- Will the measures conserve and enhance the local character and distinctiveness of historic townscapes and landscapes?
- Will the measures increase public awareness and understanding of appropriate responses for heritage assets affected by flooding and the design and implementation of other measures aimed at risk management or improving resilience?
- Will the measures provide opportunities for improved access, understanding and enjoyment of the historic environment?

The Historic England guidance on SEA/SA recognises that a combination of different types of indicators is likely to be necessary as part of the assessment process. However, the priority should be the inclusion of indicators which clearly demonstrate the significant impact(s) of the strategy on the historic environment, whether positive or negative. For example, recording numbers of assets may be appropriate as part of the baseline, but are not normally recommended for monitoring impacts.

Appendix 4 of our SEA/SA guidance provides examples of indicators for the historic environment that can be tailored to local circumstances and suggests ways in which they can be framed to:

- describe the baseline or state of the historic environment;
- monitor the type of impact or outcome; and
- track wider policy responses or actions taken to conserve and improve the historic environment, and mitigate any degradation (including avoiding or rectifying adverse impacts).

With respect to specific indicators for the strategy, we note and welcome the two shown against the SEA Objective for cultural heritage. Additional topic specific indicators might include:

- Proportion of conservation area ground at risk from flooding
- Number of designated and non-designated heritage assets harmed by flood risk management measures, including impacts on their settings

We trust the above recommendations will be of help in taking forward the assessment and strategy. Should you require any further information or wish to discuss any of the above comments in more detail, please do not hesitate to contact me.

Yours sincerely

Tom Gilbert-Wooldridge
Principal Historic Environment Planning Adviser
E-mail: tom.gilbert-wooldridge@HistoricEngland.org.uk

From: Bustard, Jonathan (NE) <Jonathan.Bustard@naturalengland.org.uk>
Sent: 17 April 2015 16:28
To: Stevens, Lee
Subject: Thurrock Council SEA Scoping Report - Local Flood Risk Management Strategy

Our ref:- 148548

Dear Lee

Thank you for consulting Natural England on the above SEA scoping report. This follows our SEA screening response in our letter dated 12th January 2015. Please accept this email in the absence of a formal response on this occasion.

Natural England has reviewed the relevant sections of the Report, and considers that the matters relevant to our remit have generally been adequately identified with appropriate SEA objectives and indicators. We also note that the scope of the SEA report will include a Habitats Regulations Assessment (HRA), which we support.

We look forward to receiving the Environmental Report in due course, as the next stage in the SEA process.

Should you require anything further in the meantime, please contact us again.

Yours sincerely,
Jonathan

Jonathan Bustard
Lead Adviser, Sustainable Land Use & Regulation
Essex, Herts, Beds, Cambs, Northants
Natural England

01206 382751 / 07721 783366

E-mail is our preferred method of communication. If absolutely necessary, any postal correspondence should be addressed for my attention to Natural England, Mail Hub Block B,
Whittington Road, Worcester WR5 2LQ

www.gov.uk/natural-england

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From: Stevens, Lee [mailto:LStevens@thurrock.gov.uk]
Sent: 19 March 2015 16:26
To: Consultations (NE)
Subject: Thurrock LFRMS SEA Scoping report

Dear Sir or Madam

Please find attached SEA scoping report for your consideration.

Kind regards

Lee Stevens l Flood Risk Manager I Planning and Transport
thurrock.gov.uk l t +44 (0) 1375 413879 l m +44 (0) 7827 354 461
Thurrock Council, Civic Offices, New Road, Grays, Essex RM17 6SL
Thurrock: A place of opportunity, enterprise and excellence, where individuals, communities and
businesses flourish

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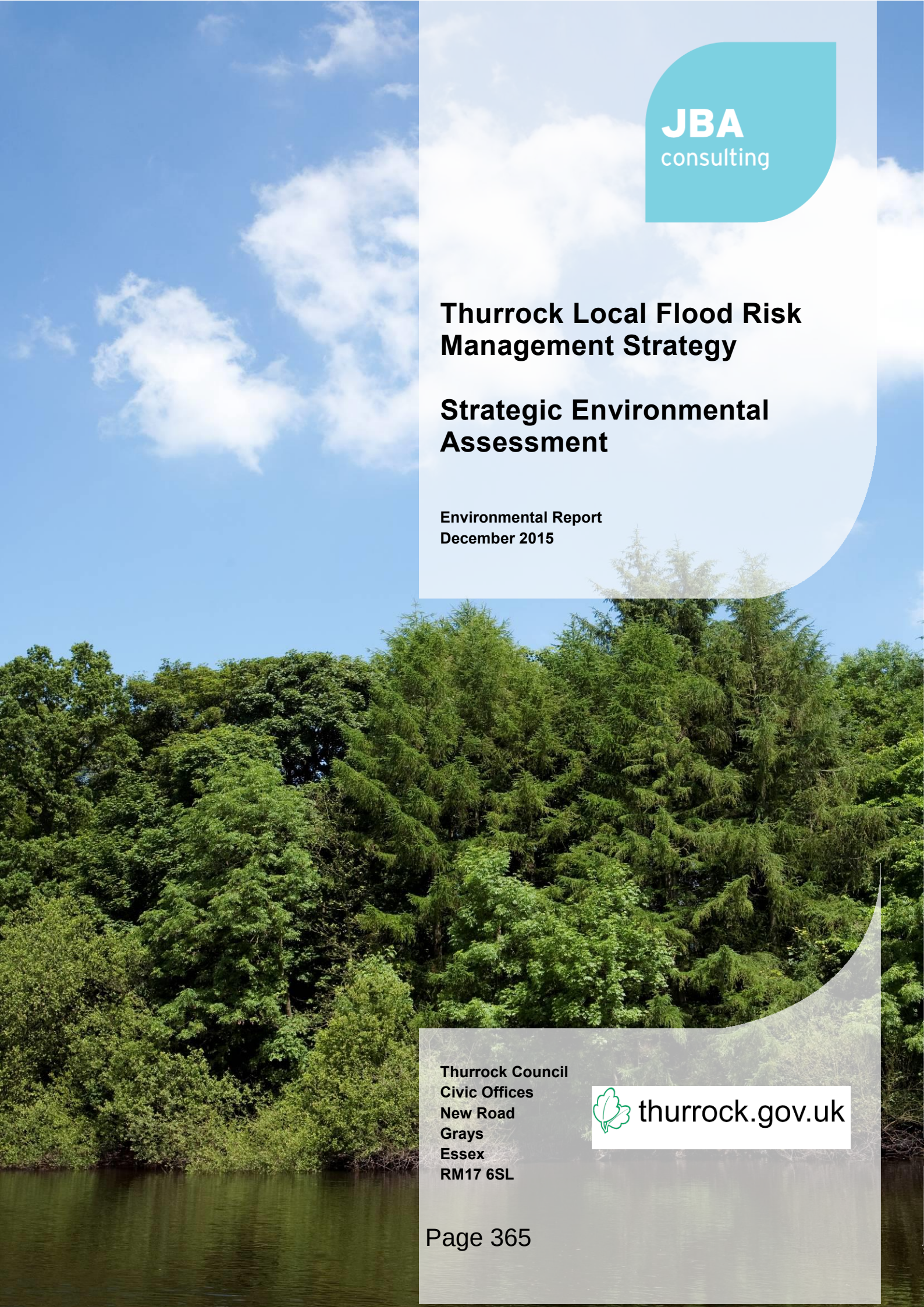

Thurrock Local Flood Risk Management Strategy

Strategy Environmental Assessment

Environmental Report
December 2015

Thurrock Council
Civic Offices
New Road
Grays
Essex
RM17 6SL

thurrock.gov.uk

JBA Project Manager

Claire Gardner
JBA Consulting
The Library
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Revision history

Revision Ref / Date Issued	Amendments	Issued to
v1-1 / 29 June 2015		Claire Gardner
v2-0 / 30 July 2015	Client review	Claire Gardner
v3-0 / 3 December 2015	Consultation comments	Claire Gardner

Contract

This report describes work commissioned by Thurrock Council. Rachel Drabble, Anissia Halwyn and David Revill of JBA Consulting carried out this work.

Prepared by ..... Rachel Drabble BSc (Hons)
Environmental Consultant

Prepared by ..... Anissia Halwyn BSc (Hons), PhD
Ecologist

Reviewed by ..... David Revill BSc MSc CEnv MIES
Principal Environmental Consultant

Purpose

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JBA Consulting has no liability regarding the use of this report except to Thurrock Council.

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Non-Technical Summary

The Thurrock Council is currently preparing a Local Flood Risk Management Strategy (LFRMS). As part of this process, the Council is also carrying out a Strategic Environmental Assessment (SEA), which considers the potential environmental effects of the LFRMS. This Environmental Report sets out findings of the SEA. It has been produced to meet the requirements of *The Environmental Assessment of Plans and Programmes Regulations 2004* (hereafter referred to as the 'SEA Regulations') and follows the guidance contained within *A Practical Guide to the Strategic Environmental Assessment Directive* (ODPM, 2005).

The full range of environmental receptors has been considered through the SEA. This meets the requirements of the SEA Directive, which requires that an assessment identifies the potentially significant environmental impacts on *'biodiversity, population, human health, fauna, flora, soil, water, air, climatic, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors'.*

The SEA Scoping Report for the LFRMS was issued to the statutory consultation bodies in March 2015. A number of comments were received on the scope of the assessment and assessment framework, which were incorporated into the preparation of this Environmental Report.

Assessment of the SEA objectives against three management options ('do nothing', 'maintain current flood risk management regime' and 'manage and reduce local flood risk') was undertaken. This identified the potential effects on the environment associated with these different management actions. The 'do nothing' option is likely to result in a number of significant adverse effects, particularly in relation to people and property, and other environmental assets including historic sites and biodiversity, where increased flooding may create new pathways for the spread of invasive non-native species. Surface water and groundwater quality could also be adversely affected, with increased flooding of contaminated sites leading to greater impacts on water resources. Conversely, increased flood risk may result in greater connectivity between watercourses and their floodplains, offering opportunities for habitat creation to benefit a range of protected and notable species.

The option to 'maintain current flood risk management regime' is likely to result in little or no change in the environmental baseline in the short to medium term as the existing flood risk management regime continues to maintain existing levels of flood protection. However, in the future, as a result of climate change, flood risk will increase, resulting in many of the impacts identified under 'do nothing', although potentially to a lesser extent and significance.

The option to 'manage and reduce local flood risk' has the potential to provide a range of environmental benefits. Flood risk management initiatives, if designed and implemented in an appropriate manner, could provide multiple benefits. This could include reducing flood risk to people and property, contributing to the protection of heritage assets, improvements in water quality, providing new opportunities for habitat creation and the provision of new recreation and amenity assets. Conversely, flood risk management measures, if implemented in an inappropriate manner, could result in adverse effects on a range of environmental features. However, this risk is managed through the preparation of this SEA and through the planning and consenting process, which is likely to require consideration of the sustainability of a project prior to its implementation.

Therefore, it is evident that by doing nothing or maintaining current levels of management, there are likely to be detrimental effects on the SEA objectives, which may be prevented by carrying out active flood risk management as proposed by the LFRMS.

Assessment of the LFRMS objectives and underpinning actions against the SEA objectives has been undertaken. No negative environmental effects have been identified from the LFRMS objectives. Many of the proposed LFRMS objectives have the potential for both direct and indirect environmental benefits. LFRMS objective 7 in particular has potential to provide a positive contribution to all of the SEA objectives and make a significant positive contribution to many of them, as it seeks to encourage design and development that not only reduces flood risk but also seeks to improve environmental quality. In particular, there is opportunity through the LFRMS to achieve a range of biodiversity benefits, including new habitat creation, enhancement of existing habitats and greater habitat connectivity.

In addition, as expected of a strategy for managing flood risk, the majority of objectives within the strategy will contribute to achievement of the SEA objectives that seek to reduce flood risk to people, property and infrastructure. As a result, the LFRMS is likely to have a significant positive effect on reducing flood risk to local communities.

Some of the LFRMS objectives, in particular 1, 3 and 7, are also likely to assist with climate change adaptation. In particular, measures that reduce flood risk, promote better use of water resources, seek to deliver new habitat creation and better connection between existing habitats (such as de-culverting), could make a significant positive contribution to achievement of SEA objective 12.

A detailed assessment of the potential cumulative effects of the LFRMS actions should be undertaken when further details regarding specific project level measures and their implementation are known.

The SEA Regulations require Thurrock Council to monitor the significant environmental effects (positive and negative) upon the implementation of the LFRMS. Key potential environmental effects that require monitoring have been identified together with the monitoring indicators that can be applied to track whether such effects occur.

This Environmental Report will be subject to public consultation for six weeks alongside the draft Thurrock Council LFRMS. All consultation responses received will be reviewed and taken into consideration for the next stage of appraisal process. This will involve the preparation of a Post Adoption Statement (PAS), which will set out how the findings of the Environmental Report and the views expressed during the consultation period have been taken into account as the LFRMS has been finalised and formally approved. The PAS will also set out any additional monitoring requirements needed to track the significant environmental effects of the strategy.

Contents

List of figures

List of tables

Abbreviations

ABO ..... Above Ordnance Datum
ALC ..... Agricultural Land Classification
AONB ..... Area of Outstanding Natural Beauty
AQMA ..... Air Quality Management Area
BAP ..... Biodiversity Action Plan
CAMS ..... Catchment Abstraction Management Strategy
CDA ..... Critical Drainage Area
FRM ..... Flood Risk Management
FSA ..... Flood Storage Area
FWMA ..... Flood and Water Management Act
GEP ..... Good Ecological Potential
HAP ..... Habitat Action Plan
HRA ..... Habitats Regulation Assessment
HMWB ..... Heavily Modified Water Body
IMD ..... Index of Multiple Deprivation
LFRMS ..... Local Flood Risk Management Strategy
LGA ..... Local Government Association
LLFA ..... Lead Local Flood Authority
LNR ..... Local Nature Reserve
LWS ..... Local Wildlife Site
NCA ..... National Character Area
NERC ..... Natural Environment and Rural Communities
NGR ..... National Grid Reference
NIA ..... Nature Improvement Area
NNR ..... National Nature Reserve
NPPF ..... National Planning Policy Framework
NVZ ..... Nitrate Vulnerable Zone
ODPM ..... Office of the Deputy Prime Minister
RBMP ..... River Basin Management Plan
rMCZ ..... Recommended Marine Conservation Zone
RMA ..... Risk Management Authority
SAC ..... Special Area of Conservation
SAP ..... Species Action Plan

SEA ..... Strategic Environmental Assessment
SLA ..... Special Landscape Area
SPA ..... Special Protection Area
SPZ ..... Source Protection Zone
SSSI ..... Site of Special Scientific Interest
SuDS ..... Sustainable Drainage Systems
SWMP ..... Surface Water Management Plan
TLSE ..... Test of Likely Significant Effect
UKCP09 ..... UK Climate Projection
WFD ..... Water Framework Directive
WRMU ..... Water Resource Management Unit

1 Introduction

1.1 Background

Thurrock Council is currently preparing a Local Flood Risk Management Strategy (LFRMS). As part of this process, the Council is also carrying out a Strategic Environmental Assessment (SEA), which considers the potential environmental effects of the LFRMS. This Environmental Report sets out findings of the SEA. It has been produced to meet the requirements of *The Environmental Assessment of Plans and Programmes Regulations 2004* (hereafter referred to as the 'SEA Regulations') and follows the guidance contained within *A Practical Guide to the Strategic Environmental Assessment Directive* (ODPM, 2005).

The ODPM guidance sets out a five stage process (A to E) to be followed (see Table 1-1). This report addresses stages B and C of the SEA process wherein LFRMS options and alternatives are identified and the predicted environmental effects of the LFRMS are assessed.

Consultation (Stage D) on this Environmental Report will be conducted as outlined in Section 1.2 of this document, whilst monitoring of the significant effects of the LFRMS (Stage E) will be undertaken in accordance with the outline monitoring programme included in Section 6.3.

Table 1-1: Stages in the SEA process

SEA Stage	Purpose
Stage A:	Setting the context and objectives, establishing the baseline and deciding on the scope
Stage B:	Developing and refining alternatives and assessing effects
Stage C:	Preparing the Environmental Report
Stage D:	Consulting on the draft plan or programme and the Environmental Report
Stage E:	Monitoring the significant effects of implementing the plan or programme on the environment.

1.2 Strategic Environmental Assessment

SEA is a statutory assessment process required under the *Environmental Assessment of Plans and Programmes Regulations 2004* (the 'SEA Regulations'). These regulations transpose into UK law the requirements of the European Directive 2001/42/EC *on the assessment of the effects of certain plans and programmes on the environment* (the 'SEA Directive')[1]. The SEA Directive requires formal assessment of plans and programmes which are likely to have significant effects (either positive or negative) on the environment. It applies to all plans and programmes which are *'subject to preparation and/or adoption by an authority at national, regional or local level'* or are *'required by legislative, regulatory or administrative provisions'* (ODPM, 2004).

Local Government Association (LGA) guidance (LGA, 2011) on the production of the LFRMS identifies the likely requirement for an SEA, stating that *'the Local [Flood Risk Management] FRM Strategy is likely to require statutory SEA, but this requirement is something the [Lead Local Flood Authority] LLFA must consider'*. A SEA screening process was therefore undertaken and the Council has confirmed the requirement for its LFRMS to undergo SEA.

SEA involves the systematic identification and evaluation of the potential environmental impacts of the LFRMS. This information is then used to aid the selection of a preferred option(s) for the strategy, which are those that best meet its economic, environmental and social objectives, and legal requirements.

The full range of environmental receptors has been considered through the SEA. This meets the requirements of the SEA Directive, which requires that an assessment identifies the potentially significant environmental impacts on *'biodiversity, population, human health, fauna, flora, soil, water, air, climatic, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors'*[1].

[1] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

Annex I of the SEA Directive sets out the scope of information to be provided by the SEA. This is described in Table 1-2 below, which also identifies where in the SEA process for the LFRMS that the relevant requirement will be met.

Table 1-2: Stages in the SEA process as identified within Annex I of the SEA Directive

SEA Directive requirements	Where covered in the SEA
(a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;	Sections 1.1, 1.2, 1.3, 2.2 and Appendix B.
(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	Section 2
(c) the environmental characteristics of areas likely to be significantly affected;	Section 2
(d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	Section 1.6, 2.5, 6.4 and Appendix A
(e) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	Section 2
(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;	Sections 4 and 5
(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Sections 5 and 6
(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	Section 4
(i) a description of the measures envisaged concerning monitoring in accordance with Article 10;	Section 6.3
(j) a non-technical summary of the information provided under the above headings.	Non-Technical Summary

The first output from the SEA process is the production of a Scoping Report (JBA Consulting, 2015), which outlines the scope and methodology of the assessment. A proportionate approach was adopted towards establishing the scope of the SEA, reflecting the high-level nature of the LFRMS. Consultation with the statutory consultees (Historic England, Natural England and the Environment Agency) was undertaken in March 2015 to confirm the baseline environment of the study area and the assessment framework (see Section 1.5 for further information).

This Environmental Report has now been prepared to set out the likely significant effects on the environment of implementing the LFRMS.

1.3 The Local Flood Risk Management Strategy

The Flood and Water Management Act (FWMA) was passed in April 2010. It aims to improve both flood risk management and the way we manage our water resources. The FWMA creates clearer roles and responsibilities and instils a more risk-based approach to flood risk management. This includes a new lead role for the Council as a Lead Local Flood Authority (LLFA) in managing and leading on local flood risk management from surface water, groundwater and ordinary watercourses.

Under the requirements of the FWMA, the Council must develop, maintain, apply and monitor a LFRMS for local flood risk management in its area. The LFRMS provides a delivery vehicle for improved flood risk management and supports the development of partnership funding and a strategic investment programme.

The LFRMS will set out:

- The roles and responsibilities for each Risk Management Authority (RMA) and their flood risk management functions; and
- Opportunities, objectives and measures for flood risk reduction of existing communities, including ways to minimise the risk from future growth.

Development of the LFRMS provides considerable opportunities to improve and integrate land use planning and flood risk management. It is an important tool to protect vulnerable communities and deliver sustainable regeneration and growth.

1.4 The study area

Thurrock is a unitary authority with borough status located in the county of Essex in south east England, 32km east of central London (see Figure 1-1). The borough is part of the London commuter belt and within the Thames Gateway redevelopment zone. The borough covers an area of approximately 163km^2 and has a population of approximately 157,750 people (2011) (Thurrock Council, 2014). Thurrock is generally low lying and bounded to the south by the Thames Estuary and bordered to the north by the boroughs of Castle Point, Basildon and Brentwood.

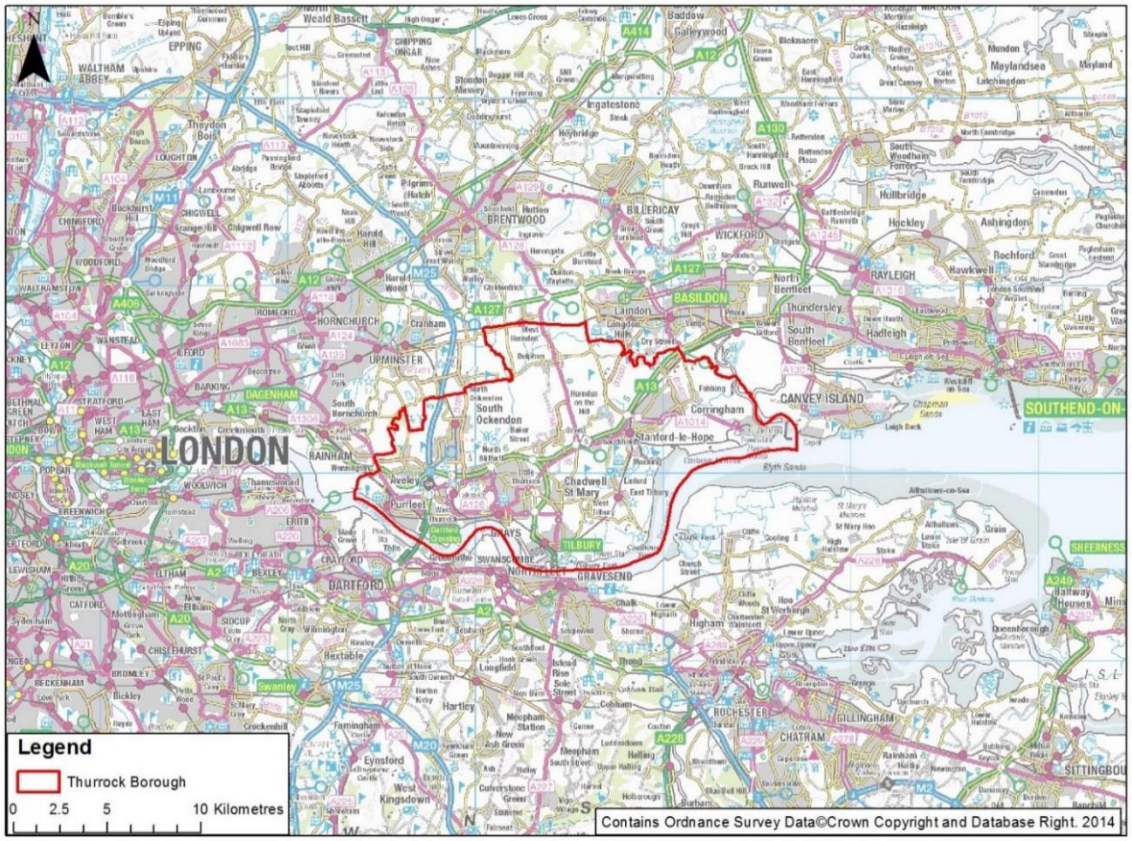

Figure 1-1: Study area

1.5 SEA scoping

The SEA Scoping Report for the LFRMS was issued to the statutory consultation bodies in March 2015. A number of comments were received on the scope of the assessment and assessment framework. Table 1-3 below summarises the comments received and how they have been addressed within this Environmental Report.

Table 1-3: SEA scoping consultation responses

Consultee	Comment received	Action taken
Natural England email dated 17 April 2015	Natural England has reviewed the relevant sections of the Report, and considers that the matters relevant to our remit have generally been adequately identified with appropriate SEA objectives and indicators.	No action required.
	We also note that the scope of the SEA report will include a Habitats Regulations Assessment (HRA), which we support.	No action required.
Environment Agency letter dated 16 April 2015	We are pleased to note that Biodiversity, Flora and Fauna, Water Environment, Soils and Geology and Climate Change have all been scoped into the Strategic Environmental Assessment.	No action required.
	Table 3-2, page 8 [of the Scoping Report], states a key theme to be "better regulation and management of the water environment to benefit water resources and flood risk, and reduce water pollution". We suggest the wording 'and improve water quality' rather than 'reduce water pollution'. Aim should be to promote multifunctional land use, for example river corridor improvements and help towards achieving Water Framework Directive objectives.	This table is not included in the Environmental Report. The Environmental Report has been reviewed to amend wording, however, amendments have not been required. The SEA includes objectives to improve water quality.
	We are happy that the report has considered Water Framework Directive (WFD), protected species, BAP species and designated sites. We are concerned that there is no mention of invasive species and the detrimental effects caused by their introduction to the environment. For example, floating pennywort has been reported from a watercourse in Tilbury and last year we removed a significant amount of the plant from the river.	Invasive species have been considered in Sections 2.5.4 and 2.5.6 of this Environmental Report.
	We believe the SEA should include a short section on reducing the incidence and spread of invasive plant and animal species, which is a legal requirement for species designated under the Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England and Wales) Order SI 2010/609.	Invasive species have been considered in Sections 2.5.4 and 2.5.6 of this Environmental Report.
	Table 3-1, pg. 7. Reference should be made to the following: • Water Act (2014) • South Essex Catchment Flood Management Plan (2009) • Thames Estuary 2100 Plan (2012) not 2002 • Thurrock Council Surface Water Management Plan (SWMP) (2013) • Thames Flood Risk Management Plan (2015 – Draft)	Updated Table 2-1 and Appendix A of this Environmental Report. The Thames Flood Risk Management Plan was not available for review at the time of writing.
	Section 3.2, pg. 8. Whilst Appendix A is acknowledged, an explanation of how these relevant policies, plans and programmes and their relationship with the LFRMS should be provided in this section.	This section is not included in the Environmental Report, therefore has not been updated.
	Section 4.2, pg. 10. Where referring to "natural low points" in the study area, Tilbury should be referred to given it is prone to surface water flooding for this very reason. This should be reflected in the final LFRMS.	Section 2.4 updated to include Tilbury and reads "There are natural low points…in Tilbury, which is due to surface water flooding due to the low ground levels."
	Figure 4-1, pg. 11. Suggest the following: • Label "Purfleet" • Change the legend text to read "Watercourses" rather than "River Network"	Figure 2-1 has been updated with these recommendations.

Consultee	Comment received	Action taken
	Concerning FRM measures and the potential to affect landscape characteristics, we advise that this should be managed via the development of Thurrock Council's proposed Riverside Strategy for the Thames Estuary.	The following text has been included in Section 2.4.1: "The FRM measures could also be managed through the development of the Thurrock Council's proposed Riverside Strategy for the Thames Estuary."
	Section 4.4.1, pg. 22. Refinement of the term "main rivers" in this context is required. If you mean the term "main river" as designated on the main river map held by the Environment Agency, then there are many more than currently referred to in the report. The Thames Estuary is not designated as a "main river" as designated on the main river map held by the Environment Agency for the Thurrock frontage. You should make further reference to "Gobians Sewer" not "Gabbions Sewer". Further explanation is required on the sentence "*These are low flow channels with no additional capacity to accept surface water runoff*". How have you derived this statement?	"Main river" has been updated to "large river", and as such, reference to the Thames as a large river has been kept. Gabbions Sewer has been changed to Gobians Sewer. The sentence "*These are low flow channels with no additional capacity to accept surface water runoff*" has been sourced from information provided in the 'Thurrock Water Cycle Study Scoping Study', Scott Wilson (2009a). A reference has been provided following the statement.
	Section 4.4.5, pg. 23. There is no differentiation between the numerous sources of flood risk in the study area, nor those that the LFRMS will seek to address (surface water, ordinary watercourse, groundwater). There is no brief outline of the roles and responsibilities under the FWMA 2010, which would be of benefit. Thurrock Council Surface Water Management Plan is not referred to at all, surface water is a significant source of flood risk in low-lying areas of the study area, especially Tilbury and Bulphan. This is arguably the most likely flood risk to people and property, although it is acknowledged that the residual risk of flooding from the Thames Estuary poses the biggest consequence. Key flooding risk areas should be referred to.	Additional text has been added to Section 2.6.5 in this Environmental Report to address these comments.
	Section 4.7, pg. 27. There is no indication of the percentage of people currently at risk of flooding, for varying sources of flood risk, within the study area, including those in deprived areas. This information should be provided to given greater context.	Information on percentage of people currently at risk of flooding in deprived areas has been added to Section 2.9.2 of this Environmental Report.
	Section 4.8.2, pg. 29. No reference is made to the existing FCRM infrastructure within the study area, including condition and status. We recommend reference is made to the Thames Tidal Defences, including Tilbury and Fobbing Barriers and Mardyke Sluice amongst others, as well as the Tilbury Flood Storage Area (FSA). This is key infrastructure required to support the study area. An examination of critical infrastructure within the study area also at flood risk is recommended, considering the impacts of climate change.	Additional text on flood defence infrastructure has been included in Section 2.10.2, along with Figure 2-12 showing flood defence assets and their condition.
	Figure 4-11, pg. 29. Detail the location of the FCRM infrastructure as referred to above.	Figure 2-12 shows this information.

Consultee	Comment received	Action taken
	Section 4.10, pg. 30. Reference to the Thurrock Council Surface Water Plan would be beneficial in this section. We also recommend consideration of development planning proposals on floodplain management in line with the National Planning Policy Framework. Our Thames Estuary 2100 plan advocates the following recommendations for the relevant policy units in the study area relevant to this section: • "…a programme of floodplain management including flood warning, emergency planning, and localised flood protection and resilience for vulnerable key sites…" • "…partnership arrangements and principles to ensure that new development in this zone is safe, and flood risk management is factored into the planning process at all levels…"	Text has been added to Section 2.12 to address these comments.
	Section 4.11, pg. 31. Update the existing conclusions in line with the recommended changes.	Changes made where required in Sections 2.10Material Assets and 2.12 Climate Change sections.
	Table 5-2, pg. 34. Population – 9: Suggest "Increasing the resilience of people, property and businesses and critical infrastructure within Thurrock to the risk of flooding".	Wording of SEA objective 9 has been updated.
	Section 6.1, pg. 36. Public consultation is encouraged as a means by which to help set the environmental context and determine the scope of assessment.	Text has been inserted into Section 7.1 regarding public consultation.
	Section 4.4.2. The report states that most of the Mardyke is not designated as Heavily Modified. Whilst this was correct, a number of changes have been made to waterbodies in the South Essex Catchment as part of the 2nd cycle of the River Basin Management Plan (2015-2021), the draft of which is currently out for consultation. As part of these changes, most of the Mardyke is now designated as Heavily Modified for Flood Protection and the lower Mardyke is also designated for Urbanisation. A number of mitigation measures required to achieve Good Ecological Potential are not in place.	Draft RBMPs were not available for review at the time of writing. Therefore, the text in Section 2.6.2 has not been amended, but additional text has been provided with these suggested updates.
	Section 4.4.3. This section mentions the Thames Estuary as well as a number of fluvial/freshwater rivers. It concludes that the Thames Estuary is the main watercourse within Thurrock which may be affected by planned growth, because it will receive effluent from Tilbury Sewage Treatment Works. The report mentions that reduction in flooding could improve water quality. However, little consideration is given to hydromorphology and ultimately ecology. This section seems to focus on chemical water quality and insufficient consideration is given to hydromorphological impacts of modifying and maintaining watercourses, which can have equally significant impacts on ecology and WFD. The scope should be increased to consider FRM activities and urbanisation/growth and development. As the fluvial rivers and estuaries within this catchment have very different characteristics and pressures, it may be worth considering them separately, with greater attention to hydromorphology as well as the water quality impacts.	Text has been added to Sections 2.6.3 and 2.6.6 relating to hydromorphology.
	Section 4.4.6. The SEA states that: "The water bodies in Thurrock currently fail to meet good ecological status/potential under the WFD. This is partly due to the installation of structures for flood conveyance and land drainage. The LFRMS will need	Text has been inserted into Section 2.6.6 to address this comment.

Consultee	Comment received	Action taken
	to consider whether any flood risk management measures will lead to adverse impacts on the watercourses within the borough and whether the LFRMS can help to contribute to achieving WFD objectives and improving water quality." We think it would be worth highlighting that not only the 'installation of structures' which contribute towards the failure to achieve Good Ecological Status. Historical maintenance and modifications to river channels to improve land drainage and flood defence also have a significant impact on the current ecological status of fluvial rivers in the catchment, for example widening, deepening, straightening, re-aligning, silt and vegetation deposits on the bank disconnecting the river from its natural floodplain and extensive removal of bank-side trees in this catchment. Furthermore, current and future maintenance activities, such as improved land drainage, vegetation clearance, de-silting, removing fallen trees from the channel, bank-side tree cutting/removal etc., also have the potential to reduce ecological status of rivers in the catchment, and prevent rivers from reaching good status. The impacts of land use and river maintenance should be considered in the LFRMS, as the strategy could have a significant effect on both land use and river maintenance undertaken by the Council or landowners/managers, and this in turn could impact on ecological status as well as WFD compliance.	
	Section 5. Again, the focus of the objectives and indicators is on water quality, with little consideration given to the environmental impact on morphology.	SEA Objective 5 has been amended to "*Improve the quality and quantity of the water and morphology in the borough's rivers*."
Historic England letter dated 20 April 2015	Historic England recommends that our guidance (2013) on SEA / Sustainability Appraisal and the Historic Environment is used to inform the environmental assessment, available at: http://historicengland.org.uk/images-books/publications/strategic-environ-assessment-sustainability-appraisal-historic-environment/	This guidance has been used to inform preparation of this SEA.
	Historic England advises that the local authority's conservation and archaeological advisers are involved throughout the preparation, assessment and implementation of the strategy.	Comments noted. Advisers will be involved if required.
	Review of Plans, Policies and Programmes Include review of the following: *At a national level*: • The National Planning Policy Framework (NPPF) recognises that the protection and enhancement of the historic environment is integral to achieving sustainable development. • The Flood Risk Regulations 2009 include a requirement to have regard to the desirability of reducing the adverse consequences of flooding for the environment (including cultural heritage). • The Flood and Water Management Act 2010 requires protection of natural and heritage assets and enhancing the environment where it is most degraded. • The National Flood and Coastal Erosion Risk Management Strategy for England includes enhancing and protecting cultural heritage and should avoid damaging the environment, including historic environment. *At a local level:* • Conservation area appraisals and accompanying management plans, particularly for conservation	Relevant plans, policies and programmes have been reviewed for the SEA, as described in Table 2-1.

Consultee	Comment received	Action taken
	areas identified at risk of flooding.	
	The cultural heritage overview of Thurrock in Section 4.3 is useful, including reference to Heritage at Risk.	Comments noted, no action required.
	The following data sources can be particularly useful in providing locally specific information, as for example: • Historic Environment Records • Preliminary Flood Risk Assessments • Historic Characterisation studies.	Where available, this data has been used to provide local information.
	Historic England also recommends that the baseline takes account of areas of archaeological importance and the potential for unrecorded archaeology, including buried, waterlogged archaeological and palaeo-environmental remains of significant interest and fragility that can be associated with river valleys, floodplains and wetland areas.	Text has been inserted into Section 2.8 to highlight the potential for unrecorded archaeology.
	Historic England recommends that, wherever possible, data sets are mapped.	Where available, datasets have been mapped.
	For both designated and non-designated heritage assets, an important consideration is the contribution of their setting to their heritage interest or significance. New development within the setting of a heritage assets may also offer opportunities for enhancing or better revealing its significance.	Text included in Section 2.8.1 addressing this comment.
	Consideration should be given to screening the Heritage at Risk Register to identify if the at risk status is associated with flood risk. Up to date information on this can be found at http://risk.historicengland.org.uk/register.aspx	This has been undertaken in Section 2.8.
	We welcome the discussion of key environmental issues relating to the historic environment in Section 4.6.1.	No action required.
	Historic England recommends the SEA assessment framework includes a specific heading objective for the SEA topic on Archaeology and Cultural Heritage, for example: *"Conserve and enhance the historic environment, heritage assets and their settings."* The current draft SEA objective on page 34 of your report could be amended as above.	Wording has been updated on SEA objective 8 to *"Conserve and enhance the historic environment, heritage assets and their settings."*
	In addition to the headline objective, it can also be beneficial for the SEA framework to include relevant sub-objectives (decision-making criteria) to help ensure that all the key heritage issues are considered and potential effects appropriately assessed. Examples are: • Will the measures reduce the number of heritage assets at risk of flooding? • Will the measures harm the significance of designated and non-designated heritage assets, including their setting? • Will the measures help secure the sustainable use of a heritage asset and/or improve its maintenance? • Will the measures lead to changes in groundwater levels or chemistry that could alter the hydrological setting of water-dependent heritage assets, including palaeo-environmental deposits?	Sub-objectives have not been included as this is a high level strategic assessment of environmental effects from FRM measures.

Consultee	Comment received	Action taken
	• Will the measures involve hydromorphological adaptations comprising the modification/removal of weirs or other in-channel structures and physical changes to rivers including de-canalisation or re-cutting old meanders? • Will the measures conserve and enhance the local character and distinctive of historic townscapes and landscapes? • Will the measures increase public awareness and understanding of appropriate responses for heritage assets affected by flooding and the design and implementation of other measures aimed at risk management or improving resilience? • Will the measures provide opportunities for improved access, understanding and enjoyment of the historic environment?	
	With respect to specific indicators for the strategy, we note and welcome the two shown against the SEA objective for cultural heritage. Additional topic specific indicators might include: • Proportion of conservation area ground at risk from flooding • Number of designated and non-designated heritage assets harmed by flood risk management measures, including impacts on their settings.	Additional indicators have been included in Table 3-2.

1.6 Habitats Regulations Assessment

The European Council Directive on *the Conservation of Natural Habitats and of Wild Fauna and Flora* (92/43/EEC, 'the Habitats Directive') as implemented through the Conservation of Habitats and Species Regulation 2010 (as amended) ('the Habitats Regulations') requires a competent authority to carry out a Habitats Regulations Assessment (HRA) of a plan or project to establish whether it will have a 'likely significant effect' on sites designated for their nature conservation interest at an international level (known as European sites, which include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and by UK Government policy, Ramsar sites). The LFRMS for Thurrock Borough, as a statutory plan, is subject to the requirements of the Habitats Directive.

Assessing the impacts of a plan under the Habitats Regulations is a separate process to SEA. However, there is overlap between these two types of assessment. A Test of Likely Significant Effect (TLSE) (Screening Assessment) has been undertaken in accordance with the requirements of the Habitats Regulations to determine whether the LFRMS is likely to adversely affect the integrity of a European site (alone or in combination with other plans, policies and projects).

All European sites lying partially or wholly within 15km of the borough boundary were included in the assessment in order to address the fact that measures in the Thurrock LFRMS may affect European sites which are located outside the administrative boundary of the strategy.

Thurrock does support one SPA and Ramsar site; the Thames Estuary and Marshes. There are also nine other European sites within 15km of the borough boundary:

- Benfleet and Southend Marshes SPA
- Benfleet and Southend Marshes Ramsar
- Medway Estuary and Marshes SPA
- Medway Estuary and Marshes Ramsar
- Crouch and Roach Estuaries SPA
- Crouch and Roach Estuaries Ramsar
- North Downs Woodlands SAC
- Peters Pit SAC
- Essex Estuaries SAC

The screening assessment concluded that the LFRMS is not likely to have a significant effect on Benfleet and Southend Marshes SPA and Ramsar, Medway Estuary and Marshes SPA and Ramsar, Crouch and Roach Estuaries SPA and Ramsar, North Downs Woodlands SAC, Peters Pit SAC and Essex Estuaries SAC. After more detailed screening, the LFRMS was also deemed not likely to have a significant effect on Thames Estuary and Marshes SPA and Ramsar site. Only a small number of LFRMS actions could potentially result in physical interventions or construction work, or directly affect water management practices. At this stage, the works under consideration are relatively small-scale and local in impact. Therefore, it is unlikely that hazards will arise on the sensitive interest features as a result of implementation of the LFRMS.

The TLSE concluded that it is not likely that any of these designated sites would be adversely impacted by flood risk management activities undertaken in the Borough and as such, no further assessment is required under the Habitats Regulations. Further details of this assessment are provided in the TLSE screening appraisal included in Appendix A of this report and a summary of its outcomes is provided in Section 6.4.

Consultation with Natural England on the outcomes of this assessment has been undertaken as part of the consultation process outlined in Section 1.5 and it was agreed that the Borough is of a sufficient distance from these sites that no likely significant effect is identified and an Appropriate Assessment is not required.

2 Environmental baseline

2.1 Introduction

The following section presents the findings of the Scoping Report (JBA Consulting, 2015), which identified the context and objectives of the LFRMS and identified and the scope of the assessment.

2.2 Other relevant plans, programmes and environmental protection objectives

As part of the SEA process, an assessment of the integration of existing policies, plans and programmes on the proposed LFRMS is required. This is to address the requirement within the SEA Directive to determine the *'relationship [of the plan or programme] with other relevant plans and programmes'* (Annex I (a)), including, *'environmental protection objectives, established at international, [European] community or [national] level'* (Annex I (e)).

Identifying these relationships enables potential synergies to be determined, strengthening the benefits that can be gained from implementation of the LFRMS. This information is also used to inform the development of the environmental baseline and the identification of key issues and problems. In addition, any inconsistencies or constraints can be identified, which could hinder the achievement of the environmental protection objectives or those of the LFRMS, and therefore providing a broad appraisal of the strategy's compliance with international, national and local considerations.

The Office of the Deputy Prime Minister (ODPM) SEA guidance recognises that no list of plans or programmes can be definitive and as a result this report describes only the key documents that may influence the LFRMS. These are shown in Table 2-1 and described in more detail in Appendix B.

Table 2-1: Policies, plans and programmes reviewed through this SEA process

Plan, Policy or Programme
International
EU Sustainable Development Strategy (revised 2006)
European Biodiversity Strategy to 2020
EC Birds Directive – Council Directive 2009/147/EEC on the conservation of wild birds
EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks
EU Groundwater Directive – Directive 2006/118/EC on the protection of groundwater against pollution & deterioration
EC Habitats Directive – Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna & flora
Urban Wastewater Treatment Directive – Directive 91/271/EEC concerning urban waste water treatment
EU Water Framework Directive – Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy
National
Securing the Future – the UK Government Sustainable Development Strategy (2005)
Flood and Water Management Act (2010)
Flood Risk Regulations (2009)
Water for People and the Environment, Water Resources Strategy for England and Wales (2009)
Future Water, The Government's water strategy for England (2008)
Making Space for Water – taking forward a new Government strategy for flood and coastal erosion risk management in England (2005)
The National Flood and Coastal Erosion Risk Management Strategy for England (2011)
Water Act (2003)
Water Act (2014)
Draft Water Bill (2012)
The National Flood Emergency Framework for England (2011)
The Carbon Plan (2011)
Building a Low Carbon Economy – the UK's Contribution to Tackling Climate Change (2008)
Climate Change Act (2008)
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystems (2011)

Plan, Policy or Programme
England Biodiversity Framework (2008)
UK Biodiversity Action Plan (1994)
National Wetland Vision (2008)
Wildlife and Countryside Act (as amended) (1981)
Natural Environment and Rural Communities (NERC) Act (2006)
Salmon and Freshwater Fisheries Act (1975)
Contaminated Land (England) Regulations (2006)
National Planning Policy Framework (2012)
PPS5: Planning for the Historic Environment Practice Guide (2010)
Historic Environment Good Practice Advice in Planning: Historic Environment Records (2014)
Historic Environment Good Practice Advice Guide in Planning: Note 3: The Setting of Heritage Assets.
Regional / Local
Thames Catchment Flood Management Plan (2009)
South Essex Catchment Flood Management Plan (2009)
Thames Estuary 2100 Strategy (2012)
Thames Gateway Delivery Plan (2009)
Managing Water Resources & Flood Risk in the South East (2005)
London Rivers Action Plan (2009)
Thames River Basin Management Plan
Thames Flood Risk Management Plan (2015 – Draft)
Thurrock Council Local Air Quality Action Plan (2004)
Thurrock Environmental Vision and Policy (2013)
Essex County Council Preliminary Flood Risk Assessment (2011)
Thurrock Strategic Flood Risk Assessment Level 1 Report (2009) and Level 2 Report (2010)
Thurrock Transport Strategy 2013-2026 (2013)
Thurrock Local Development Framework Core Strategy and Policies for Management of Development (2011)
Thurrock Council Surface Water Management Plan (2014)
Sustainable Community Strategy Thurrock 2020 (2009)
Essex Biodiversity Action Plan (2011)
Thurrock Biodiversity Action Plan 2007-2012
Essex County Council Adapting for Climate Change – Action Plan (2014)
Open Spaces Strategy 2006 – 2011 (2006)
Riverscapes – An environmental vision for Thurrock 2013-2023 (2013)

2.3 Environmental characteristics and key issues

A search of baseline environmental information was undertaken to identify the key environmental characteristics of the borough. This included details of the environmental status and condition of notable environmental features; current and future predicted trends in the evolution of the environment; and issues and problems currently affecting the environment. The baseline information is used as the basis for predicting and monitoring the effects of the LFRMS implementation.

The information obtained through this desk study is broadly strategic in nature and reflects the high-level objectives of the LFRMS. It has been obtained from a broad range of sources and no new investigations or surveys were undertaken as part of the scoping process. The baseline may require updating throughout the duration of the SEA process as the LFRMS is developed further and new information becomes available.

2.4 Landscape and visual amenity

Much of the riverside area of Thurrock is highly urbanised, with a mixture of industrial and residential development at the western and eastern ends. The landscape character of Thurrock is not uniform, with the main physical feature being the River Thames, which forms the southern border of the borough, with the bank of the Thames being heavily urbanised between Aveley Marshes and Tilbury, and again around Holehaven Creek (Thurrock Council, 2006). The landscape of the borough divides roughly into industrial/urban land south of the A13 and mixed

urban, village and rural land to the north of the A13. Approximately 60% of the borough is open countryside, predominantly agricultural land and dispersed villages. Approximately 70% of Thurrock is designated as Metropolitan Green Belt (URS, 2014).

The built environment of Thurrock is very varied, with redevelopment and renewal of the area creating mainly residential developments along the banks of the Thames. Old industrial sites have also been developed into new housing areas and the Lakeside retail development. Historically, the main urban centres have grown up around the riverbank industries including oil, aggregate, cement works, scrapyards, power stations and docks (Scott Wilson, 2009a). The main settlements include Grays, Stanford-le-Hope, Corringham, South Ockendon and Tilbury (Figure 2-1). Post-war suburban residential areas have expanded and, in some cases, merged with others. Villages in open countryside have not expanded due to Green Belt restrictions, and have therefore retained a small scale and rural character (Thurrock Council, 2006).

Farmland is the major land use in Thurrock, with a mosaic of ditches, hedgerows, woods, ponds, pasture and field margins (Thurrock Council, 2007). There are also the Thames Terraces, of which the Purfleet-Grays ridge rises from the Thames to 25m above sea level, forming a central belt of sands and gravels across the borough (Thurrock Council, 2007).

There are two Special Landscape Areas (SLA) classified for their landscape importance in a regional and countrywide context; the Mardyke Valley and Langdon Hills (Thurrock Council, 2011a). These areas are designated by Thurrock Council to safeguard areas of regional or local landscape importance from inappropriate developments.

The highest elevations of the borough, the Langdon Hills are .in the north-east, where ground levels reach approximately 50m Above Ordnance Datum (AOD). There are natural low points along the fluvial floodplain of the River Mardyke in the north-west, Stanford Brook in the south-east corner, with ground levels between 2 and 6m AOD (URS, 2014) and in Tilbury, which is due to surface water flooding due to the low ground levels.

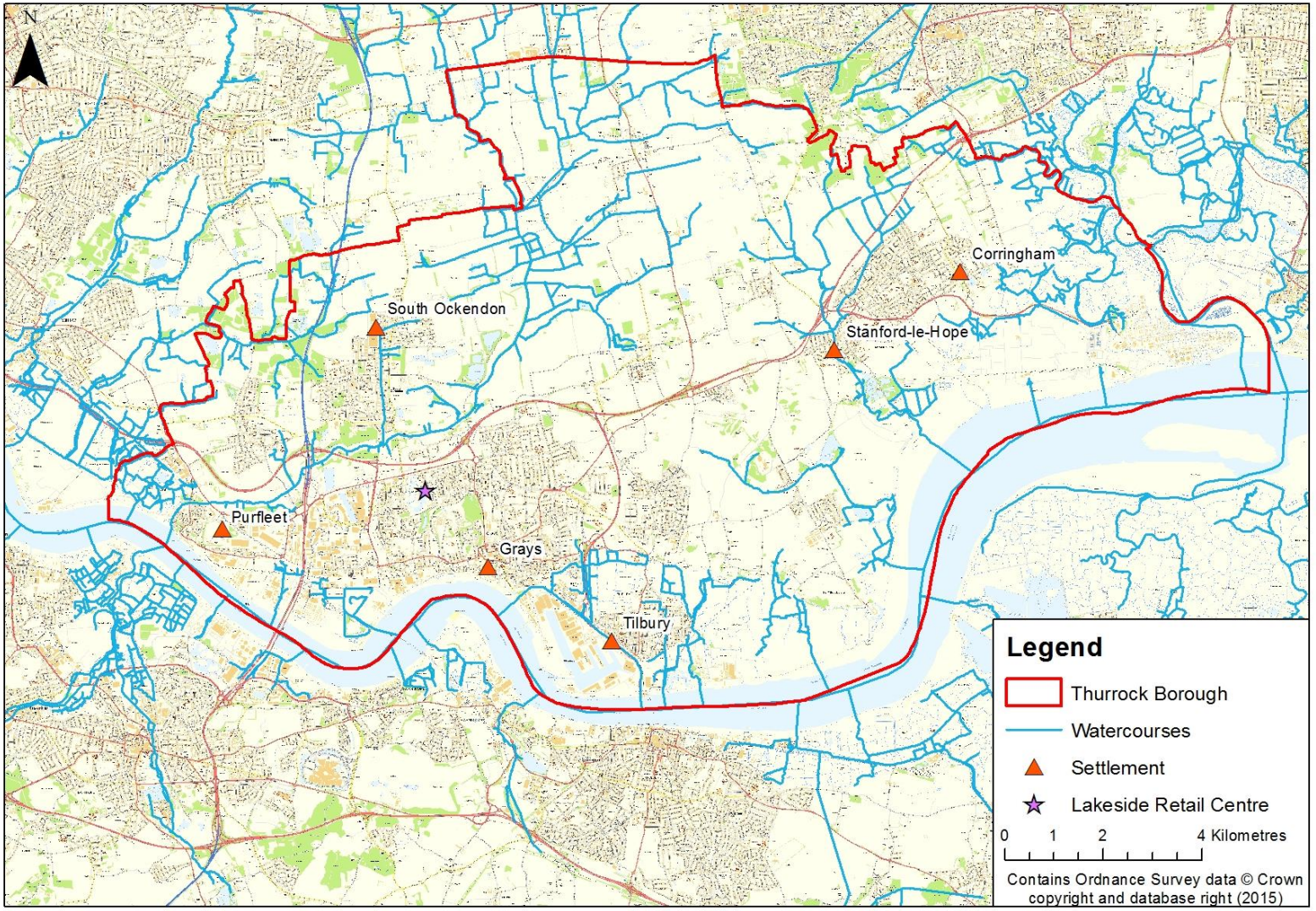

Figure 2-1: Main settlements and river network in Thurrock

There are no Areas of Outstanding Natural Beauty (AONB) or National Parks in the borough of Thurrock. Thurrock is in the Northern Thames Basin (111) National Character Area (NCA), which extends from Hertfordshire in the west to the Essex coast in the east (Natural England, 2013). The countryside has suffered from the effects of mineral working and the landfilling of waste, and continues to be affected by other land use changes associated with urban fringe activities and changing agricultural land management practices (Chris Blandford Associates, 2005). However, there are strategies to improve the landscape character of the borough, such as the South Essex Green Grid Strategy, which was launched in 2008 to create five major green infrastructure projects in South Essex, including the creation of Thurrock Thameside Nature Park in Mucking (Parklands South Essex, 2009).

Thurrock's landscape character can be divided into five distinct types and areas (Thurrock Council, 2006):

- Fenland – North Thurrock around Bulphan.
- Rolling farmland/wooded hills – North Thurrock around Langdon Hills and Horndon on the Hill.
- Marshland – to the east of Thurrock along the Thames Estuary.
- Urban fringe – Thurrock's urban areas apart from Stanford-Le-Hope and Corringham.
- Urban areas – Aveley, Chadwell St Mary, Corringham, Grays, Purfleet, Stanford-Le-Hope, Tilbury and West Thurrock.

The Thames forms a distinctive 'riverscape' along the southern edge of the borough. In the west near Aveley Marshes, the Thames is narrow, widening towards Holehaven Creek in the east. The banks of the river are penetrated by large creeks, smaller inlets and bays. The river bank is heavily industrialised between Aveley Marshes and Tilbury, and again around Holehaven Creek (Chris Blandford Associates, 2005).

2.4.1 Key environmental issues

Key issues and challenges arising from current and anticipated forces for change in the Thurrock landscape are (Chris Blandford Associates, 2005):

- Arresting the further dilution of landscape character resulting from current farming practices.
- Ensuring that any potential new peripheral urban development is sited to minimise impacts on landscape character and visual amenity.
- Improving the transport network in an effort to reduce high traffic levels that create noise intrusion and barriers to movement within the borough.
- Addressing the adverse impacts of small-scale incremental changes on the character and quality of the landscape.

Pressure from new development and associated infrastructure are likely to present significant challenges as the area responds to an increasing population and the demands of economic development and climate change.

Flood risk management measures have the potential to affect the landscape characteristics in the borough. This includes changes to the river corridors, impacts on existing open spaces, and impacts on the setting of local landmarks and landscape features. Many of these aspects are protected through regional and local policies and as such could restrict the implementation of LFRMS objectives if they are shown to present a risk to the quality of the landscape. The FRM measures could also be managed through the development of the Thurrock Council's proposed Riverside Strategy for the Thames Estuary.

2.5 Biodiversity, flora and fauna

2.5.1 Designated nature conservation sites

Thurrock supports internationally designated nature conservation sites. There is one Ramsar and SPA site within the borough, and three Ramsar sites and SPAs within 15km of Thurrock's boundary (Figure 2-2). These sites are all designated as both SPA and Ramsar and are all estuary sites to the east of the borough. The borough does not support any SACs, but there are three within 15km (Figure 2-2). European sites within 15km of Thurrock are described in Table 2-2.

Table 2-2: European sites within 15km of Thurrock borough

Site name	Distance from Thurrock	Qualifying/Interest features
Thames Estuary and Marshes SPA	Within – borders the coastline around Stanford-le-Hope and Tilbury	The site is a complex of brackish, floodplain grazing marsh, ditches, saline lagoons and intertidal saltmarsh and mudflat. The estuary and adjacent grazing marsh areas support an important assemblage of wintering waterbirds including avocet *Recirvirostra avosetta*, hen harrier *Circus cyaneus* under Article 4.1. The site also qualifies under Article 4.2 for support populations of European importance of ringed plover *Charadrius hiaticula*. It is also a wetland of international importance (JNCC, 2005a).
Thames Estuary Marshes Ramsar	Within – borders the coastline around Stanford-le-Hope and Tilbury	The site is a complex of brackish, floodplain grazing marsh, ditches, saline lagoons and intertidal saltmarsh and mudflat. The Ramsar is designated for one endangered plant species (least lettuce *Lactuca saligna*) and at least 14 nationally scarce plants of wetland habitats. The site also supports more than 20 British Red Data Book invertebrates. The site also supports a bird assemblage of international importance, and a variety of bird species occur at levels of international importance. These include the ringed plover *Charadrius hiaticula*; black-tailed godwit *Limosa limosa islandica*; grey plover *Pluvialis squatarola*; red knot *Calidris canutus islandica*; dunlin *Calidris alpina alpina*; and common redshank *Tringa tetanus* (JNCC, 2000).
Benfleet and Southend Marshes SPA	3.6km east	The site comprises an extensive series of saltmarshes, cockle shell banks, mud-flats and grassland that supports a diverse flora and fauna. The site qualifies under Article 4.2 by supporting populations of European importance of the following migratory species: ringed plover *Charadrius hiaticula,* dark-bellied brent goose *Branta bernicla bernicla,* grey plover *Pluvialis squatarola* and knot *Calidris canutus*. The site also qualifies under Article 4.2 by regularly supporting at least 20,000 waterfowl (JNCC, 2005b).
Benfleet and Southend Marshes Ramsar	3.6km east	This site comprises an extensive series of saltmarshes, mudflats and grassland which support a diverse flora and fauna, including internationally important numbers of wintering waterfowl. It is designated for waterfowl assemblages of internationally importance and populations occurring at levels of international importance, including the dark-bellied brent goose *Branta bernicla bernicla*, grey plover *Pluvialis squatarola* and red knot *Calidris canutus islandica* (JNCC, 1994).
Medway Estuary and Marshes SPA	8.6km south-east	The site has a complex arrangement of tidal channels, which drain around large islands of saltmarsh and peninsulas of grazing marsh. The site qualifies under Article 4.1 by supporting populations of European importance of avocet *Recirvirostra avosetta,* little tern *Sterna albifrons* and also qualifies under Article 4.2 for a number of populations of European importance for migratory species (JNCC, 2005c).
Medway Estuary and Marshes Ramsar	8.6km south-east	This site has a complex of rain-fed, brackish, floodplain grazing marsh with ditches, and intertidal saltmarsh and mudflat. The site is designated for its rare plants and animals, with at least 12 British Red Data Book species of wetland invertebrates. There are also waterfowl assemblages of international importance and populations of several bird species at levels of international importance (JNCC, 1993).

Site name	Distance from Thurrock	Qualifying/Interest features
North Down Woodlands SAC	9km south	Designated for two Annex I habitats, *Asperulo-Fagetum* beech forests and yew *Taxus baccata* woods (JNCC, 2014a).
Crouch and Roach Estuaries SPA	10km north-east	The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between sea walls along both banks and the river channel. This leaves a relatively narrow strip of tidal mud which is used by significant numbers of birds. The site qualifies under Article 4.2 by supporting populations of European importance of the dark-bellied brent goose *Branta bernicla bernicla* (JNCC, 2005d).
Crouch and Roach Estuaries Ramsar	10km north-east	The site is designated for its assemblage of rare, vulnerable or endangered species or sub-species of plant and animal including 13 nationally scarce plant species. As with the other sites, there are waterfowl assemblages of international importance and populations at levels of international importance (JNCC, 1998).
Essex Estuaries SAC	10km north-east	Designated for the habitats that exist at the site, for example estuaries, mudflats, sandflats and Atlantic salt meadows, among others (JNCC, 2014d). Epping Forest SAC is approximately 16km north-west of Thurrock. The site has an Annex I habitat that is a qualifying feature; Atlantic beech forests (JNCC, 2014e). This site overlaps the Crouch and Roach SPA and Ramsar.
Peters Pit SAC	12km south	Designated for the presence of the great crested newt *Triturus cristatus*, an Annex II species (JNCC, 2014b).

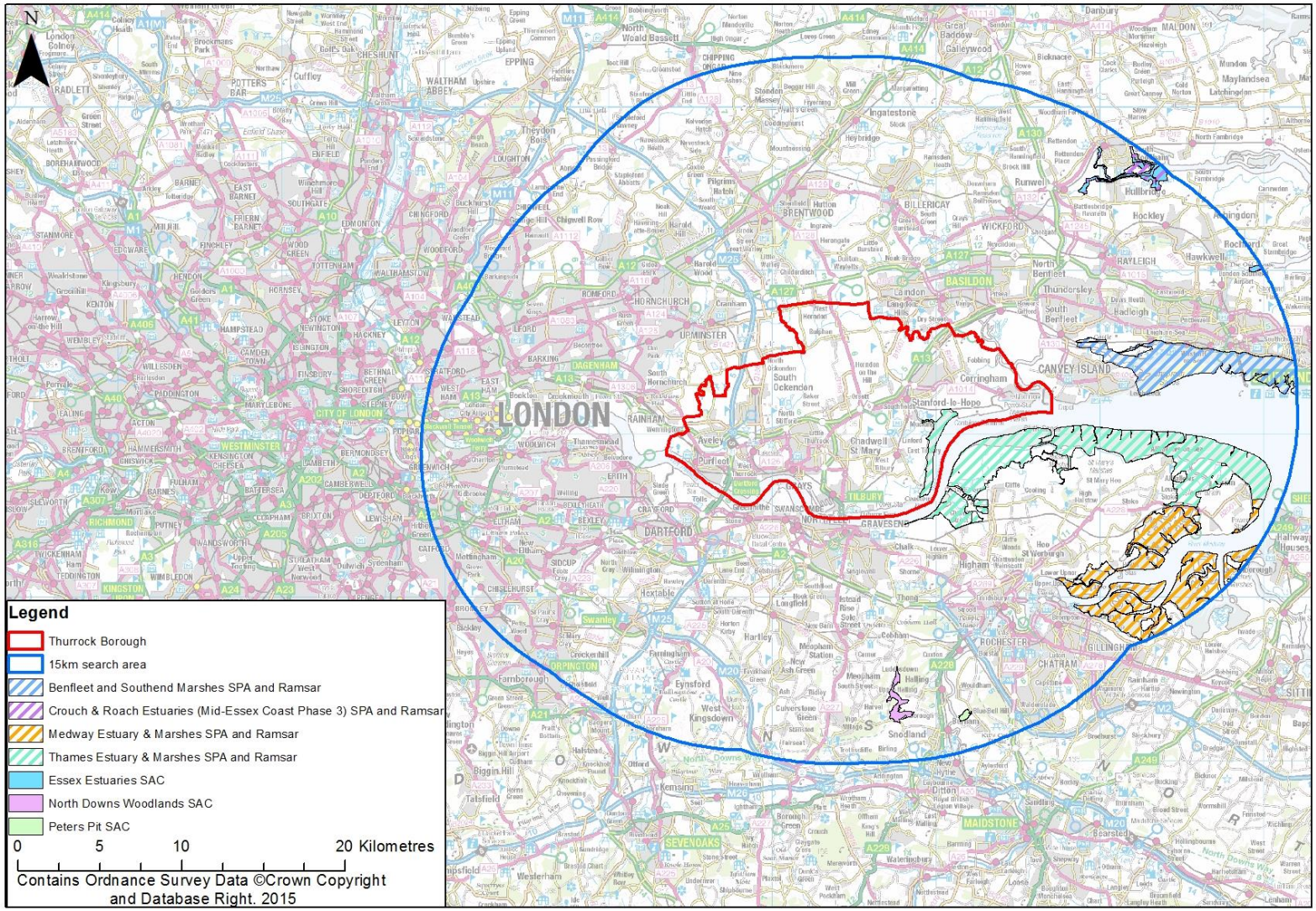

Figure 2-2: European sites within 15km of Thurrock

There are 12 Sites of Special Scientific Interest (SSSI) in Thurrock (Figure 2-3) with 57% of these sites classified by Natural England as in a favourable condition (Thurrock Council, 2011a). Thurrock's SSSIs are described in Table 2-3.

Table 2-3: SSSIs within Thurrock borough

SSSI name	Location	Interest features	SSSI condition
Mucking Flat and Marshes SSSI	South-east. Covers a portion of the Thames Estuary and Marshes Ramsar and SPA.	Waterfowl and estuarine habitats. The mudflats form the largest intertidal feeding area for wintering wildfowl and waders west of Canvey Island.	Favourable (94.13%) Unfavourable – recovering (5.87%)
Holehaven Creek SSSI	Eastern border, extending to the Thames.	Regularly supports nationally important numbers of wintering black-tailed godwit.	Favourable (100%)
Inner Thames Marshes SSSI	Western border, extending to the Thames	Forms the largest remaining expanse of wetland bordering the upper reaches of the Thames Estuary.	Favourable (42.37%) Unfavourable – recovering (17.8%) Unfavourable – no change (5.73%) Unfavourable – declining (31.36%) Destroyed (1.15%)
Vange and Fobbing Marshes SSSI	Eastern border	Unimproved coastal grassland and associated dykes and creeks support a diversity of maritime grasses and herbs.	Favourable (85.69%) Unfavourable – recovering (14.31%)
West Thurrock Lagoon and Marshes SSSI	Borders the Thames close to Grays	One of the most important sites for wintering waders and wildfowl on the Inner Thames Estuary.	Unfavourable – no change (33.31%) Unfavourable – declining (66.69%)
Basildon Meadows SSSI	North-east	Three unimproved herb-rich meadows lying on neutral soils, among the few areas of old pasture known to remain in Essex.	Favourable (100%)
Gray's Thurrock Chalk Pit SSSI	Grays	Active mineral extraction which ceased in the 1920s has led to a natural colonisation of the pit with woodland, scrub and calcareous grassland habitats important for assemblage of invertebrate fauna.	Unfavourable – recovering (100%)
Purfleet Chalk Pits SSSI	West	Contains complex lithostratigraphical and biostratigraphical evidence indicates the importance of evolution of Thames and Northern European interglacial sequences.	Favourable (56.57%) Unfavourable – declining (35.48%) Destroyed (7.96%)
Lion Pit SSSI	Grays	Exhibits a complex sequence of Pleistocene Thames deposits, which have yielded molluscs, ostracods and pollen.	Favourable (100%)
Purfleet Road, Aveley SSSI	West	Aveley silts and sands have yielded important assemblages of molluscs, insects, pollen and mammal remains which are indicative of temperate, or interglacial, conditions.	Favourable (23.75%) Unfavourable – no change (76.25%)
Globe Pit SSSI	Grays	An important site for the interrelationship of archaeology with geology, since it provides correlation of the Lower Palaeolithic chronology with Pleistocene Thames Terrace sequence.	Favourable (100%)
Hangman's Wood Deneholes SSSI	Grays	Contains remains of medieval chalk mines, which provide the most important underground hibernation site for bats in Essex, with three species of bat recorded. Hangman's Wood is an area of semi-natural habitat in which bats can feed and is a relict fragment of ancient woodland and is a scheduled monument	Favourable (100%)

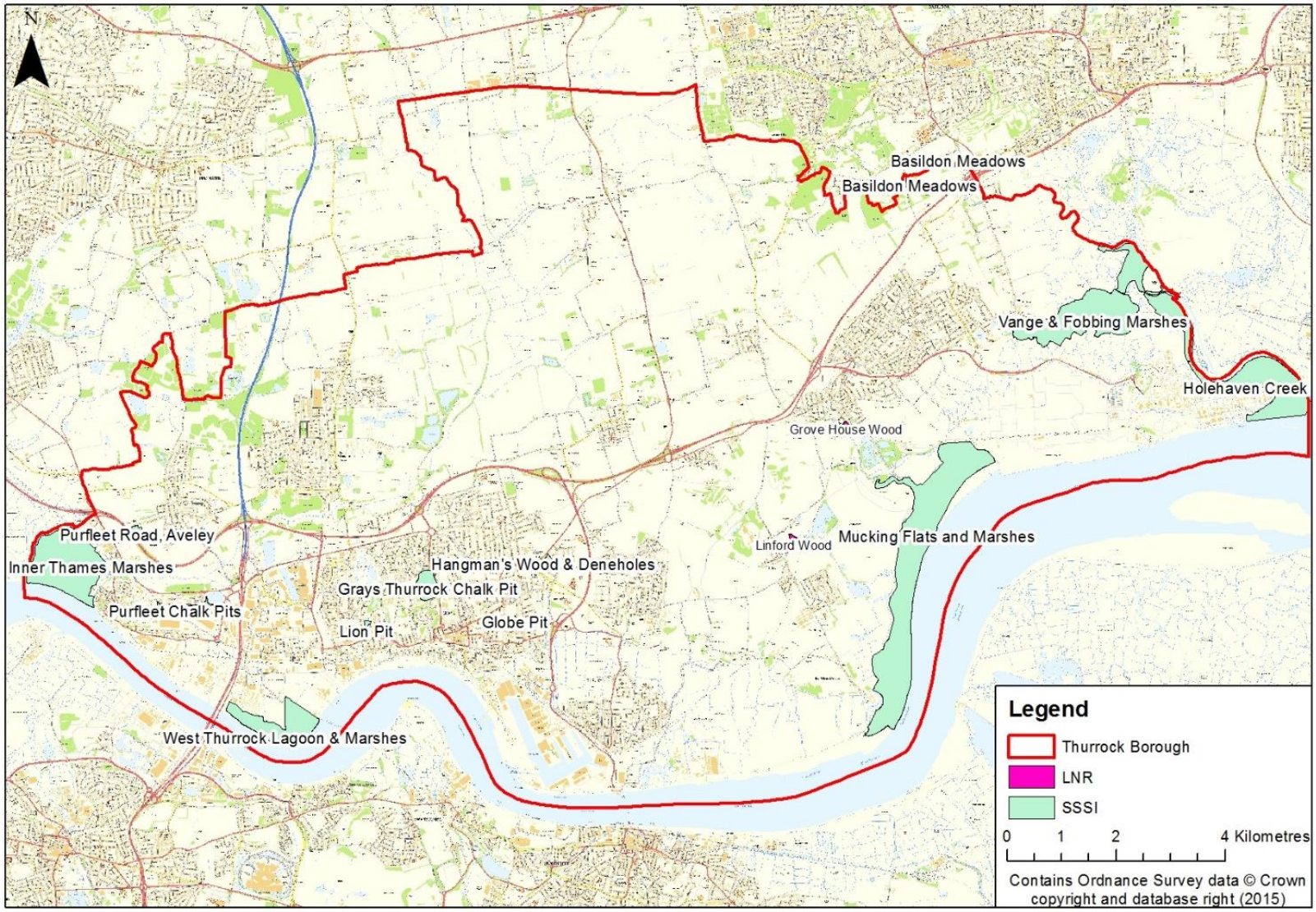

Figure 2-3: SSSIs and LNRs in Thurrock

There are no National Nature Reserves (NNR) in Thurrock, but three NNRs within 15km (Table 2-4).

Table 2-4: NNRs within 15km of Thurrock

Site name	Distance from Thurrock	Qualifying and Interest features
Swanscombe Skull Site NNR	2km south	Site is of national importance because of the prehistoric fossils discovered here, including one of the oldest human skulls ever found in the UK.
Leigh NNR	5km east	The flats at Leigh NNR support a wide variety of birds, particularly migratory species.
High Halstow NNR	6km south-east	The NNR is a complex mosaic of scrub and woodland habitat, dominated by hawthorn scrub and ancient oak woodlands, with regenerating elm woodland. The most important feature of this site is the heronry, which has over 200 pairs, making it the largest heronry in Britain.

Thurrock borders the Thames Estuary recommended Marine Conservation Zone (rMCZ), a site that is proposed to be designated for the many fish species that breed in the river, including eel and smelt (The Wildlife Trusts, 2012).

Part of the Thurrock borough is also located within the Greater Thames Marshes Nature Improvement Area (NIA), one of 12 areas funded by the Government to bring key partners together to plan and deliver significant improvements for wildlife and people. The NIA covers over 50,000ha of marshland and estuarine habitat (Greater Thames Marshes, 2015). The biodiversity of the NIA is considered to be underperforming as biodiversity is in decline and struggling to compete with the increasing pressures of climate change and development (Natural England, 2014).

There are only two Local Nature Reserves (LNR) within the borough (see Figure 2-3). These are Linford Wood LNR and Grove House Wood LNR, both of which are within the eastern half of the borough. Linford Wood LNR is primarily a woodland site that includes areas of hedgebank, mixed woodland willow plantation, ditches and an open area, and is surrounded by arable farmland. Grove House Wood LNR contains a mix of habitats including reedbeds, a pond and a brook as well as woods, and is an important local habitat for wildlife.

2.5.2 Local designated sites

There are 70 Local Wildlife Sites (LWS) (Thurrock Council, 2011a). These are sites that are of local importance and are designated by the local authority; however, they have no statutory protection. The LWSs include ancient woodland, hedgerows and green lanes, post-industrial brownfield sites, reedbeds and chalk grassland. Of the 70 LWSs, 33 sites have management plans in place (URS, 2013).

There are six nature reserves managed by the Essex Wildlife Trust in Thurrock, mainly in the east of the borough. Fobbing Marsh nature reserve, in the east of the borough, is one of the few remaining Thameside grazing marshes, part of which was dammed in the aftermath of the 1953 floods. It also support the nationally rare least lettuce *Lactuca saligna* (Essex Wildlife Trust, 2014a). Also in the east is Thurrock Thameside Nature Park which includes a landfill site that is being transformed into a Living Landscape with views over Mucking Flats SSSI and Thames Estuary SPA (Essex Wildlife Trust, 2014b). Stanford Warren nature reserve is located adjacent to the River Thames, and consists of one of the largest reedbeds in Essex. The reeds provide habitat for many birds over the year (Essex Wildlife Trust, 2014c). Hornden Meadow is also in the east of the borough; whilst less than one hectare in size, it contains around 80 species of wildflowers (Essex Wildlife Trust, 2014d). Chafford Gorges nature reserve in Greys is the only site in the west of Thurrock. The park provides green space for wildlife and the population of Chafford Hundred and overlooks Warren Gorge (Essex Wildlife Trust, 2014e).

2.5.3 Notable habitats and species

As described above, Thurrock has a variety of habitats, including ancient woodland and coastal and floodplain grazing marsh. Ancient woodland does not cover a large amount of Thurrock, being mainly fragmented in the west and north (see Figure 2-4).

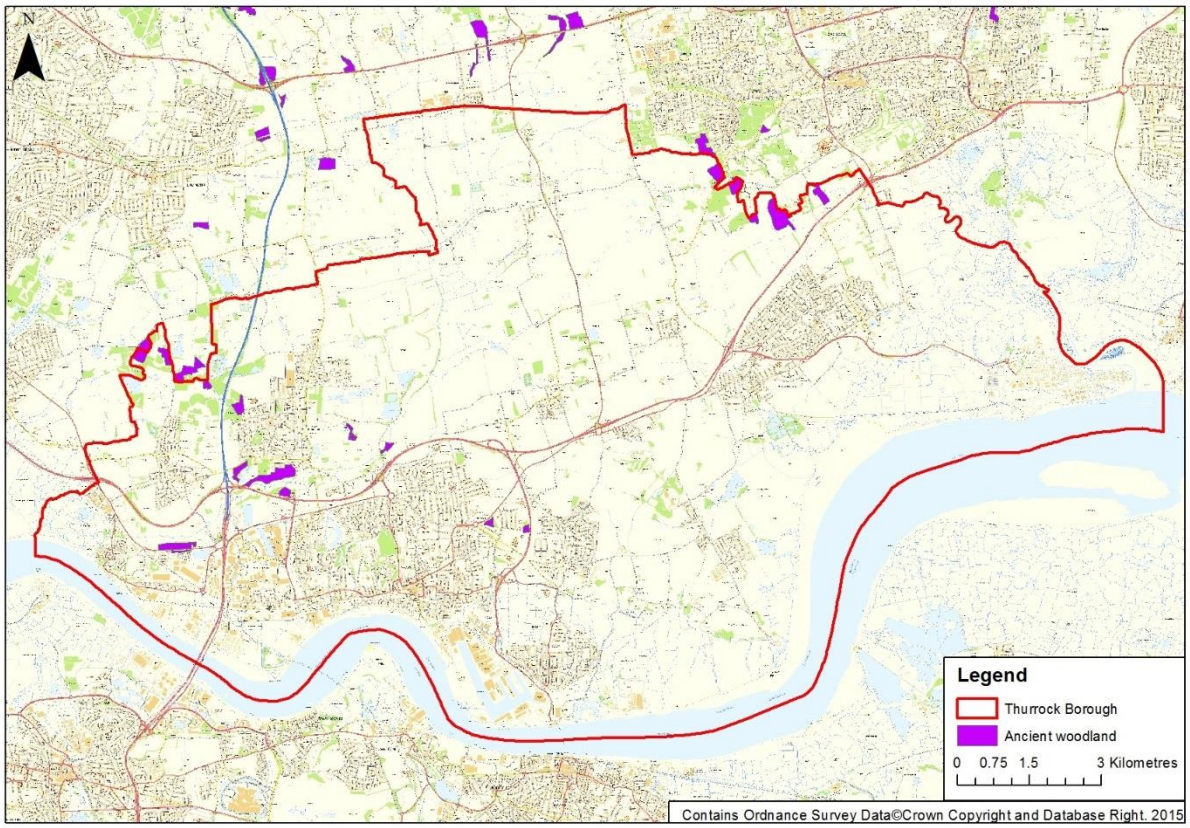

Figure 2-4: Ancient woodland in Thurrock

Coastal and floodplain grazing marsh data was provided by Thurrock Council. This marsh is periodically inundated pasture, or meadow, usually mesotrophic, with ditches which maintain water levels and contain standing brackish or fresh water. This habitat type is generally present along watercourses, and is particularly prevalent in the east of the borough (Figure 2-5). These ditches are especially rich in plants and invertebrates. Grazing marshes are particularly important for breeding waders such as snipe *Gallinigo gallinigo*, lapwing *Vanellus vanellus* and curlew *Numenius arquata*.

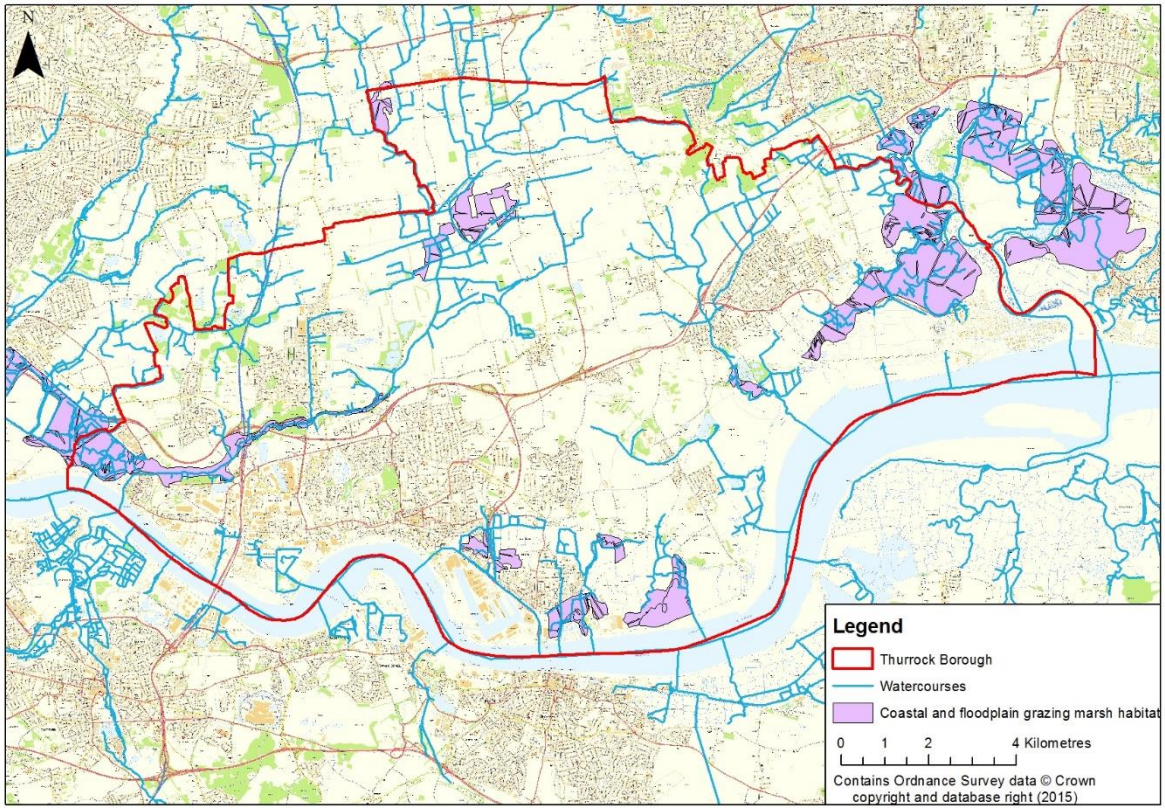

Figure 2-5: Coastal and floodplain grazing marsh in Thurrock (Source: Thurrock Council)

Priority Biodiversity Action Plan (BAP) habitats that are present include wet woodland, grassland, reedbeds, purple moor grass rush pastures, mudflats, lowland meadows and lowland heath. These habitats are mainly present in the east and south of the borough (see Figure 2-6).

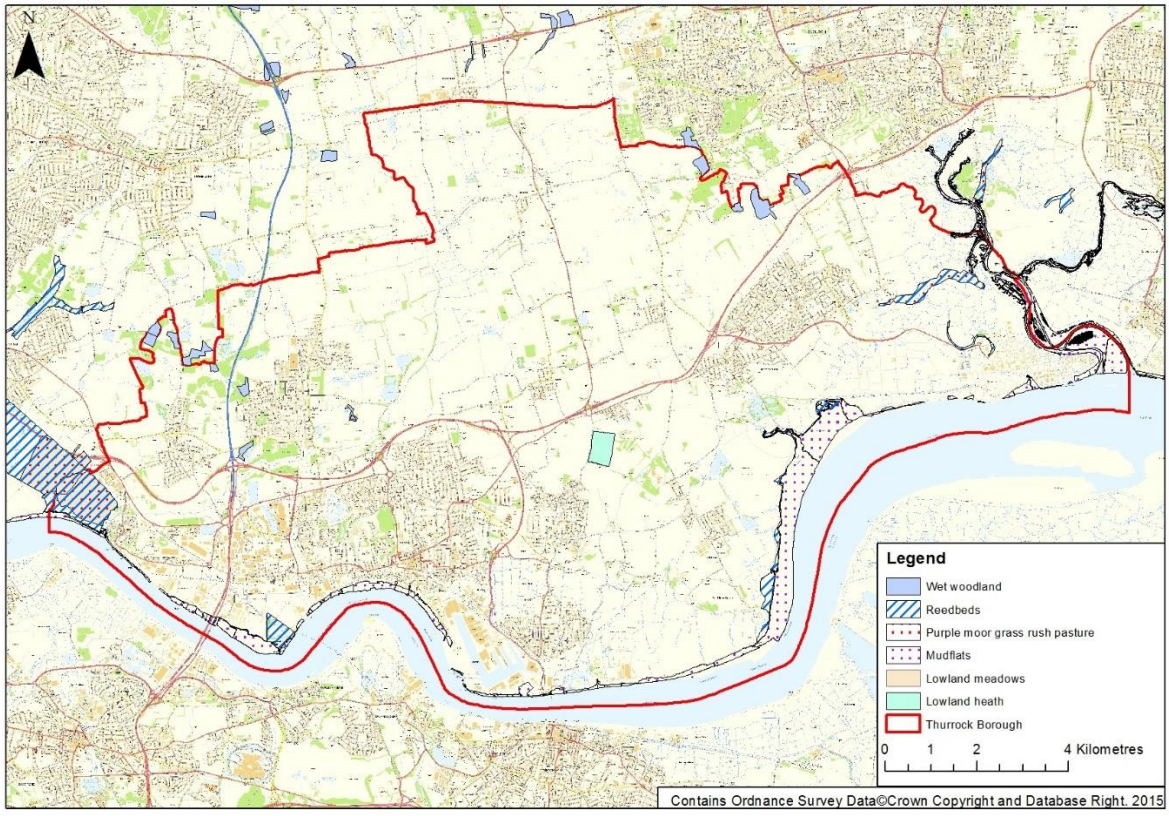

Figure 2-6: BAP Priority Habitats in Thurrock

The following priority habitats are listed as part of the Essex BAP, which sets out the species and habitats that should be protected and enhanced within the borough. Each habitat has an independent Habitat Action Plan (HAP) (Essex Biodiversity Project, 2012a):

- Arable field margins
- Hedgerows
- Traditional orchards (and Essex Apple varieties)
- Lowland dry acid grassland
- Lowland meadows
- Lowland heathland
- Ponds
- Floodplain and coastal grazing marsh
- Lowland raised bog
- Reedbeds
- Coastal saltmarsh

More locally, key habitats for Thurrock include (URS, 2013):

- Estuarine: coastal areas from Corringham to East Tilbury provide nationally important feeding grounds for a wide variety of over-wintering waders and wildfowl.
- Farmland: as the major land use within Thurrock, sympathetic management of farmland is considered to be vital to the conservation of the areas wildlife and landscape.
- Thames terraces: the Purfleet-Grays ridge rises from the Thames, forming a central belt of sands and gravels across the borough, where short acidic grassland can develop.
- Woodland: there are many semi-natural broad-leaved woods in the north of the borough, covering 2% of the land area.

The coastal zone supports some of Thurrock's most important wildlife sites, particularly at Stanford and Corringham which provide national important feeding grounds for a wide variety of over-wintering waders and wildfowl. The estuarine habitat in Thurrock borough supports a complex of coastal grassland, watercourses and fringing saltmarsh that supports numerous invertebrates, birds and nationally rare plants (Thurrock Council, 2007).

On the Thames Terraces, where the soils remain unimproved or the underlying minerals are exposed due to extraction, short acidic grasslands can develop. These areas of grassland and short scrub support nationally important assemblages of insects (Thurrock Council, 2007).

Semi-natural broad-leaved woodlands cover about 2% of the land area in Thurrock, mostly in the north of the borough. Most of these are former coppice woods that were managed to produce an annual harvest of wood. Typically, the woodlands are hazel, hornbeam or sweet chestnut coppice with pedunculate oak and ash standards (Thurrock Council, 2007).

The following priority species are listed as part of the Essex BAP and each species has an independent Species Action Plan (SAP) (Essex Biodiversity Project, 2012b):

- Badger *Meles meles*
- Barn Owl *Tyto alba*
- Bats
- Nesting birds
- Dormouse *Muscardinus avellanarius*
- Great Crested Newt
- Invertebrates
- Otter *Lutra lutra*
- Reptiles
- Water Vole *Arvicola amphibius*

- White-clawed Crayfish *Austropotamobius pallipes*
- Wildflowers.

White-clawed Crayfish however are not present in within the Borough, and the last known river-based population in Essex is at risk (Essex Rivers Hub, undated).

2.5.4 Invasive species

Invasive species can have detrimental effects on local species and habitat and the wider environment, and are of particular cause for concern due to certain species' ability to spread along the river network. Floating pennywort has been reported in a watercourse in Tilbury (Environment Agency, 2015). Many invasive species have been recorded in Essex. Himalayan balsam has been recorded on at least 35 river banks in north east Essex and Signal crayfish in every Essex river. Japanese knotweed has also been recorded at many sites (Essex Biodiversity Project, 2012c).

The incidence and spread of invasive plant and animal species should be reduced in accordance with the Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England and Wales) Order SI 2010/609.

2.5.5 Fisheries

Problems with water and habitat are believed to be the main contributory factors to poor fish stocks in the Mardyke (Scott Wilson, 2009a). However, the River Mardyke retains its designation as a cyprinid freshwater fishery. There are many species of fish occur in the Mardyke river valley, the most common are roach *Rutilus rutilus*, carp *Cyprinus carpio*, eel *Anguilla anguilla*, perch *Perca fluviatilis* and chub *Squalius cephalus* in the upper reaches, with tench *Tinca tinca*, rudd *Scardinius erythropthalmus* and flounder *Platichthys flesus* mainly restricted to lower river sections (Scott Wilson, 2009a).

2.5.6 Key environmental issues

The rural areas within Thurrock are under increasing pressure from development and changes in land use, particularly as a result of changes in farming practice, alternative uses for buildings in the countryside and pressure for outdoor recreation, leisure and commercial uses. Development pressure is arising from the Thames Gateway, which is developing marshland. Some brownfield land has high biodiversity value, and promoting development on brownfield land that is sympathetic to biodiversity is a key challenge. Other pressure, particularly related to biodiversity in river networks, is due to the increase in invasive species in the area.

A large number of designated sites, particularly those within the NIA, are under pressure from climate change and development. These are dependent on underlying hydrological conditions and are therefore vulnerable to flooding and changes in hydrology. These sites support a number of species that are reliant on tidal habitat, and are subsequently are at risk from flooding events, poor water quality, changes to hydrological/tidal regimes and habitat changes.

Future incidences of flooding could potentially damage and change the nature of habitats and supporting species composition within the designated nature conservation sites both within and outside the borough. The LFRMS will need to consider whether any flood risk management measures will lead to adverse impacts on the water bodies within the borough and whether the LFRMS can help contribute to delivering any mitigation measures such as through improvements to fish passage. Implementation of the LFRMS may also provide opportunity to enhance or create new habitats within the borough.

Flooding and flood risk management has the potential to significantly impact on a number of species of note in the borough. Some, such as water vole, are dependent upon aquatic and riparian habitats, and are sensitive to changes in habitat conditions, changes in water quality, flow, vegetation cover and bank profile. Great crested newt, a species protected under national and European law, are water dependent species found in the borough.

2.6 Water environment

2.6.1 Water resources

The East of England is the driest region in England and is one of the fastest growing in terms of development, and consequently water resource availability is limited, with supply-demand issues in parts of the region. There is little or no water available from existing sources within Thurrock and

therefore future development will be served by the increase in storage at Abberton Reservoir near Colchester, which was completed in 2014 (URS, 2013). Water supply in Thurrock is supplemented via the Thames Water Utilities raw water bulk supply from Lea Valley reservoirs to Chigwell Water Treatment Works, along with two local water supply boreholes in Thurrock itself at Linford and Stifford (Scott Wilson, 2009a).

Thurrock is part of the fully integrated Essex water resources zone, which is controlled by Essex and Suffolk Water. There are no identified pressure or capacity issues in the water supply infrastructure, with local reinforcements provided within Thurrock (Scott Wilson, 2009a).

Chalk is the principal underlying aquifer of the region (Scott Wilson, 2009a). However, the impermeable London Clay precludes infiltration of rainfall over large areas of the chalk aquifer in the north of the district and beyond, thereby restricting its use in water resource development. Despite this, the aquifer is unconfined and chalk groundwater is utilised for public water supply (Scott Wilson, 2009a).

In some areas of the borough, groundwater levels are rising in response to the cessation of long-term water abstraction in the 1970s (Scott Wilson, 2009a). This has not caused an increase in flood risk from groundwater.

Large rivers in Thurrock include:

- Mardyke, located in the west of the borough, running from the north, before flowing westwards to where it enters the Thames at Purfleet. It is a fenland stream system, with two main sources at Langdon Hills and Cranham. The Mardyke catchment is 111.6km^2 and has a main river length of 18.5km (Scott Wilson, 2009a).
- Tidal River Thames flowing along the southern boundary of the borough, and is entirely tidal along this stretch.

In addition to the two major river systems, there are several smaller watercourses, ditches and drains within the borough:

- Stanford Brook, Manor Way Creek and Fobbing Creek in the east of borough.
- Gobians Sewer, Stone House Sewer, East Tilbury Dock Sewer and West Thurrock Sewer. These are low flow channels with no additional capacity to accept surface water runoff (Scott Wilson, 2009a).

Water resources within a catchment are assessed and monitored by the Environment Agency within a Catchment Abstraction Management Strategy (CAMS). There are two water resource management units (WRMU) covering the Thurrock area; The Mardyke and Thameside Chalk. Throughout the Mardyke catchment, London Clay heavily confines the chalk aquifer resulting in a lack of hydraulic connection between river and aquifer. Abstraction in the Mardyke has developed significantly and water is utilised for a range of purposes. Agriculture is the dominant sector in the upper reaches of the catchment, while industrial abstraction dominates the lower reaches (Scott Wilson, 2009a).

The Thameside Chalk catchment is exposed at or near the ground surface near Thurrock, with flow from other areas of the Upper Chalk likely to be a significant source of recharge. The unit has been assessed as having no water available for further abstractions (Scott Wilson, 2009a).

2.6.2 Water Framework Directive

Thurrock is covered by the Thames River Basin Management Plan (RBMP), which identifies the current quality of water bodies in the borough and sets objectives for making further improvements to the ecological and chemical quality.

The River Mardyke drains a significant proportion of the borough and flows south and then south--west through Thurrock to its confluence with the River Thames at Purfleet. The Mardyke catchment is generally low-lying with low channel gradients and is predominantly agricultural. The Mardyke is generally not designated as a Heavily Modified Water Body (HMWB), and has an overall status of Moderate under the WFD (Environment Agency, 2009a). One of the key objectives under the WFD is the requirement to prevent deterioration in the current status of water bodies, whilst HMWB must achieve 'good ecological potential' (GEP) within a set deadline. If an activity has the potential to impact on the ecology or morphology of the water body, the risk of causing deterioration in the status must be assessed. The Mardyke generally has a Moderate ecological status, however, the Mardyke (West Tributary) and Mardyke (East Tributary) have a Poor overall status and Poor ecological status, although it is not designated as a HMWB. The Mardyke and Fobbing water body is designated as a

HMWB and has Moderate ecological potential under the WFD. Overall, Mardyke and Fobbing are classed as Moderate. Issues to the WFD status of the Mardyke catchment arise from its significant physical modifications to facilitate flood conveyance and land drainage (Environment Agency, 2009a).

The section of Thames south of Thurrock extending east to Stanford-le-Hope is classed as the 'Thames Middle' water body, and is designated as a HMWB, with a current overall potential of Moderate. The Thames Lower water body runs east from Stanford-le-Hope and is also designated as a HWMB, with an ecological and overall status of Moderate.

Currently, a second cycle of RBMPs (2015 – 2021) are undergoing consultation. As part of the updates, most of the River Mardyke is designated as Heavily Modified for Flood Protection and the lower Mardyke for urbanisation. A number of mitigation measures required to achieve GEP are not in place.

2.6.3 Surface water quality

Water quality within the lower stretches of the River Mardyke, which flows through Thurrock's south western urban area, is currently moderate to poor quality and fails to meet 'good ecological status' under the WFD (URS, 2013). The very shallow gradient and low river flows exacerbates the poor water quality (Scott Wilson, 2009a).

Chemical water quality of the River Mardyke in the years 2005-2007 has been recorded as poor or bad, whilst the biological value has been recorded as good or fairly good. Nitrates are moderately low to moderate and phosphates are excessively high (Scott Wilson, 2009a). The lower reaches of the Mardyke have a history of suffering from low dissolved oxygen levels as a result of 'ponding' which occurs when the tidal flap at the outfall is closed on the highest tides and freshwater begins to back up. In some cases, saline water enters the freshwater system and exacerbates the problem (Scott Wilson, 2009a).

The Thames Estuary is the main watercourse within Thurrock that will be affected by the planned growth within the area, as it is the receiving watercourse for the effluent discharge from Tilbury waste water treatment works. Additionally, there is poorly managed surface water runoff from Purfleet, West Thurrock and Lakeside, Tilbury and London Gateway. Further upstream of the Thames, water quality monitoring observations show levels of Ammonia, Total Organic Nitrogen and Dissolved Oxygen decrease downstream, with no evidence suggesting that surface water inputs from Thurrock increases these parameters (Scott Wilson, 2010).

Much of northern Thurrock is within a surface water Nitrate Vulnerable Zone (NVZ). These zones are designated where land drains and contributes to the nitrate found in 'polluted' waters. Thurrock is not covered by a drinking water safeguard zone.

Hydromorphology is another factor that could affect water quality, and could also affect the ecological quality of the waterbodies in Thurrock. FRM activities and urban development can affect hydromorphology, which leads to potentially detrimental ecological effects.

2.6.4 Groundwater quality

Groundwater provides vital resources for public water supply in the borough. Impacts on groundwater are broadly related to land use, with agricultural areas representing a major source of nitrates. There are two main risks that affect aquifers in Thurrock; salinity and nitrate. The main source of nitrate is from agricultural inputs in the northern part of Thurrock, and excessive pumping from groundwater may also increase salinity as a result of drawing poorer quality water up from depth (Scott Wilson, 2010).

Groundwater quality in the Thameside Chalk is generally good in Thurrock, with recent infiltration to the aquifer, but becomes poor to the north and east of the WRMU where older water containing high concentrations of chloride and sodium can be found within the confined chalk (Scott Wilson, 2009a).

Thurrock is within the South Essex Thurrock Chalk groundwater body for WFD, with a current quantitative quality of good, but a chemical quality rated poor (and deteriorating). This results in a current overall status of poor (Environment Agency, 2009a).

The Lakeside area and the area between Grays, Tilbury and Stanford-le-Hope are covered by groundwater source protection zones (SPZ). These zones show the risk of contamination from any activities that might cause pollution in the area. Thurrock also lies within a groundwater vulnerability zone, which highlights the importance of groundwater resources in the area.

2.6.5 Flooding

There are numerous sources of flooding with Thurrock, such as surface water, ordinary watercourses and groundwater. Sources of flooding for Thurrock from rivers are the River Thames Estuary, River Mardyke, the Stanford Brook and the arterial drainage network which drains low lying areas of Thurrock. The most significant events tend to be storm surges coupled with high spring tides, as the Thames Estuary poses the greatest flood risk to Thurrock. River Mardyke poses some fluvial flood risk in the northern part of the district, however the area is predominantly rural, therefore there are few population centres under threat from flooding from this river (Scott Wilson, 2009b).

Under the FWMA 2010, there are many different roles and responsibilities with regards to flood management, and therefore relevant to the LFRMS. The responsibilities are as follows (Defra, 2014):

- Environment Agency – responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. The Environment Agency has operational responsibility for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea.
- Lead Local Flood Authorities – responsible for developing, maintaining and applying a strategy for local FRM and maintaining a register of flood risk assets.
- District Councils – key partners in planning local flood risk management and can carry out FRM works on minor watercourses.
- Highway Authorities – responsible for providing and maintaining highway drainage and roadside ditches and must not ensure that road projects do no increase flood risk.
- Water and sewerage companies – responsible for managing the risks of flooding from water and foul or combined sewer systems providing drainage from buildings and yards.
- Regional Flood and Coastal Committees – responsible for ensuring coherent plans are in place for identifying, communicating and managing flood and coastal erosion risks across catchments and shorelines.
- Department of Communities and Local Government – ensure flood risk is appropriately taken into account in the planning process.

Thurrock Council's SWMP deals with flooding from sewers, drains and groundwater, and the runoff from land, watercourses and ditches that can follow heavy rainfall. The plan includes 14 Critical Drainage Areas (CDA), which are areas most at risk of surface flooding. These are largely concentrated in urban areas, where the greatest depths of surface water flooding are predicted to be in Stanford-le-Hope and Grays. Tilbury is also an area at risk, as surface water from the north of Thurrock flows towards the Tilbury Marshes (Thurrock Council, 2014b).

2.6.6 Key environmental issues

Within the Thames RBMP, high population densities cause a number of pressures on the water environment, such as discharges from sewage networks and high demand for water. Diffuse pollution is a major pressure on the water environment, coming from urban and rural areas. Specific pressures include abstraction and artificial flow regulation; organic pollution; pesticides; phosphate; and urban and transport pollution (Environment Agency, 2009a). Thurrock has particular pressures relating to development within the Thames Gateway area, therefore increasing pressure on water resources and also increasing risk of pollution incidents and declines in water quality.

Flooding has the potential to create pathways through which potential contamination sources (e.g. sewage treatment works) could result in pollution. Conversely, the LFRMS could help protect these sites and improve water quality.

The water bodies in Thurrock currently fail to meet good ecological status/potential under the WFD. This is partly due to the installation of structures for flood conveyance and land drainage, which affect the hydromorphology of the watercourse. Historical maintenance and modifications to river channels to improve land drainage and flood defence also have a significant impact on the current ecological status, for example widening, deepening, straightening, re-aligning, silt and vegetation deposits on the bank disconnecting the river from its natural floodplain and extensive removal of bank-side trees in this catchment. Future activities, such as improved land drainage, vegetation clearance and de-silting, etc. could also have the potential to reduce the ecological status of rivers in the catchment and prevent rivers from reaching good status. The LFRMS will need to consider whether any flood risk management measures will lead to adverse impacts on the watercourses within the borough and whether the LFRMS can help contribute to achieving WFD objectives and improving water quality.

2.7 Soils and geology

Chalk underlies the whole of Thurrock, and is near to ground surface in the south-west of the borough. This chalk dips southward beneath the Thames and northward beneath deep deposits of London Clay (Scott Wilson, 2009a).

There are three main soil types in Thurrock, which include groundwater dominated gley soils. Gley soils are characteristically a mixture of coarse and fine loamy permeable soils affected by groundwater. In the north-east of the borough brown soil dominates, except within flood zones. These soils are loamy or clayey with reddish or reddish mottled, clay-enriched soil.

The soils along the coastal zone are predominantly alluvial with a significant clay content and are periodically or permanently waterlogged, whereas the soils inland are predominantly clay but also exhibit a loamy characteristic making them more suitable for cultivation (Scott Wilson, 2009a). Generally the soils are fertile with the majority classified under the Agricultural Land Classification (ALC) as Grade 3 or above under agricultural land classification, where Grade 1 is 'excellent quality' (see Figure 2-7).

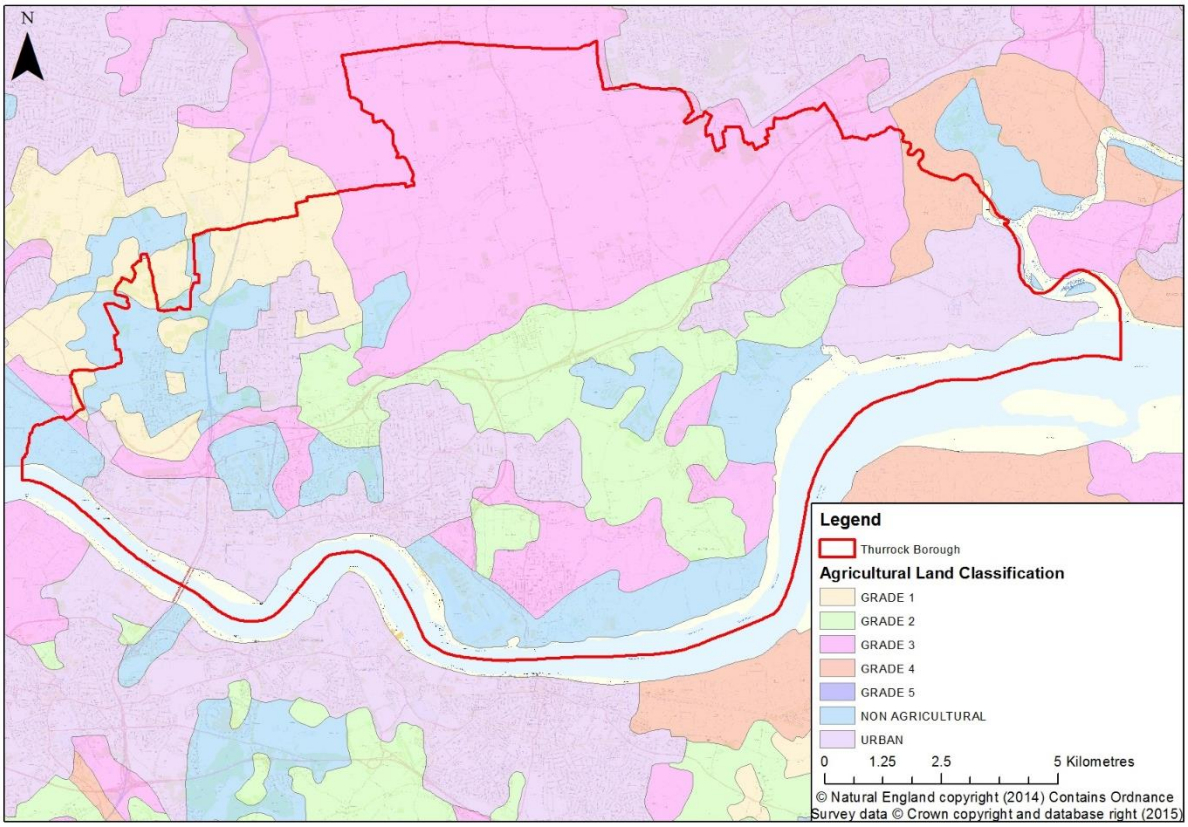

Figure 2-7: Agricultural Land Classification map for Thurrock

The underlying geology of Thurrock is Chalk and Red Chalk, with a band to the north comprising Oldhaven, Blackheath, Lambeth Group and Thanet Beds (Figure 2-8). To the north of the A13, these layers are overlain by London Clay (Scott Wilson, 2009a). The surface geology of the borough has been strongly influenced by the natural migration of the River Thames (Chris Blandford Associates, 2005).

Adjacent to the shores of the River Thames and the Mardyke is low lying floodplain dominated by groundwater gley soils, whereas the north of the borough is seasonally waterlogged slowly permeable surface water gley soils intersected by a network of drainage ditches (Chris Blandford Associates, 2005).

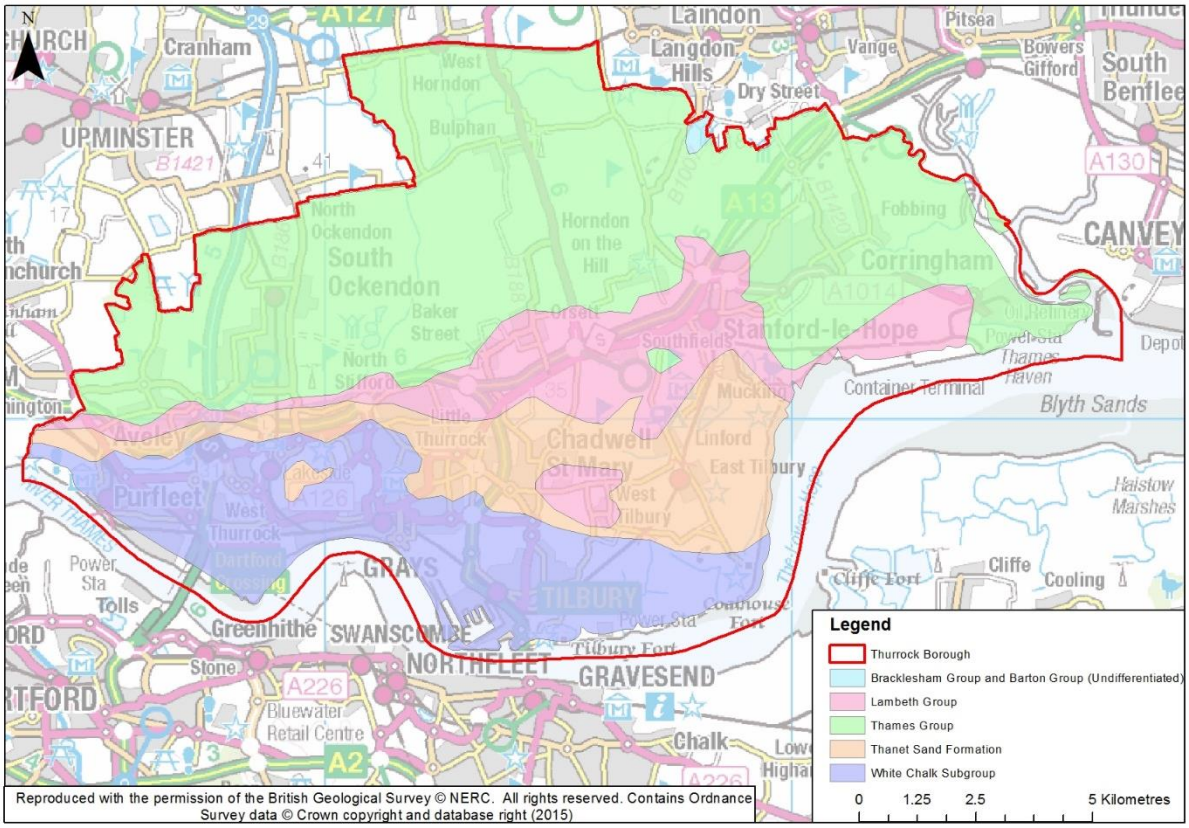

Figure 2-8: Bedrock geology of Thurrock

The drift deposit geology consists of alluvium in the south of the borough. Alluvium is also present within the floodplain of River Mardyke in the northern part of Thurrock. Alluvium consists of clays, silts, sands and gravels and the permeability can be highly variable depending on the exact composition of the material (Scott Wilson, 2010).

There are no Local Geological Sites (GeoEssex, 2015) with the borough, however there are five SSSIs that have a geological interest: Gray's Thurrock Chalk Pit SSSI; Lion Pit SSSI; Globe Pit SSSI; Purfleet Road, Aveley SSSI; and Purfleet Chalk Pits SSSI, as discussed above.

2.7.1 Key environmental issues

Flood risk management could alter the extent or duration of flooding and therefore the LFRMS will need to consider implications for soil quality and the underlying geology. Impacts on soil quality could affect other environmental receptors, such as nature conservation sites that are reliant on the underlying soil characteristics. Impacts on soil quality could affect other environmental receptors, such as nature conservation sites that are reliant on the underlying soil characteristics.

There is a need for the protection and maintenance of the integrity of the designated geological SSSIs.

2.8 Historic environment

There is evidence that people first began to settle in the area 300,000 years ago. Thurrock was a favoured area due to the rich and fertile river valleys. This history moves on to Roman times, where some fields retain prehistoric and Roman field systems. Roman settlement was centred on the Roman road towards Tilbury (Chris Blandford Associates, 2005). The name Thurrock is thought to derive from the Saxon word 'turruc', which described the bottom of a ship where water collects. The 17th century marked a new threshold in the architectural development of manor houses, consequently Thurrock has a rich and diverse historic environment ranging from prehistoric sites, medieval buildings and Tudor and Victorian forts. Historic assets in the borough (Figure 2-9) include:

- 16 scheduled monuments: these are historic sites of national importance and include Tilbury Fort and a crop mark complex.
- 241 listed buildings: these are statutorily designated and include 13 which are Grade I. These are all churches, with the exception of Government powder magazine, the only survivor of a group of five magazines built 1760s.

- One registered park and garden: Belhus Park, designed by Capability Brown.
- Seven conservation areas: Horndon-on-the-Hill; Corringham; Orsett; Fobbing; Purfleet; West Tilbury; and East Tilbury (Thurrock Council, 2011a).

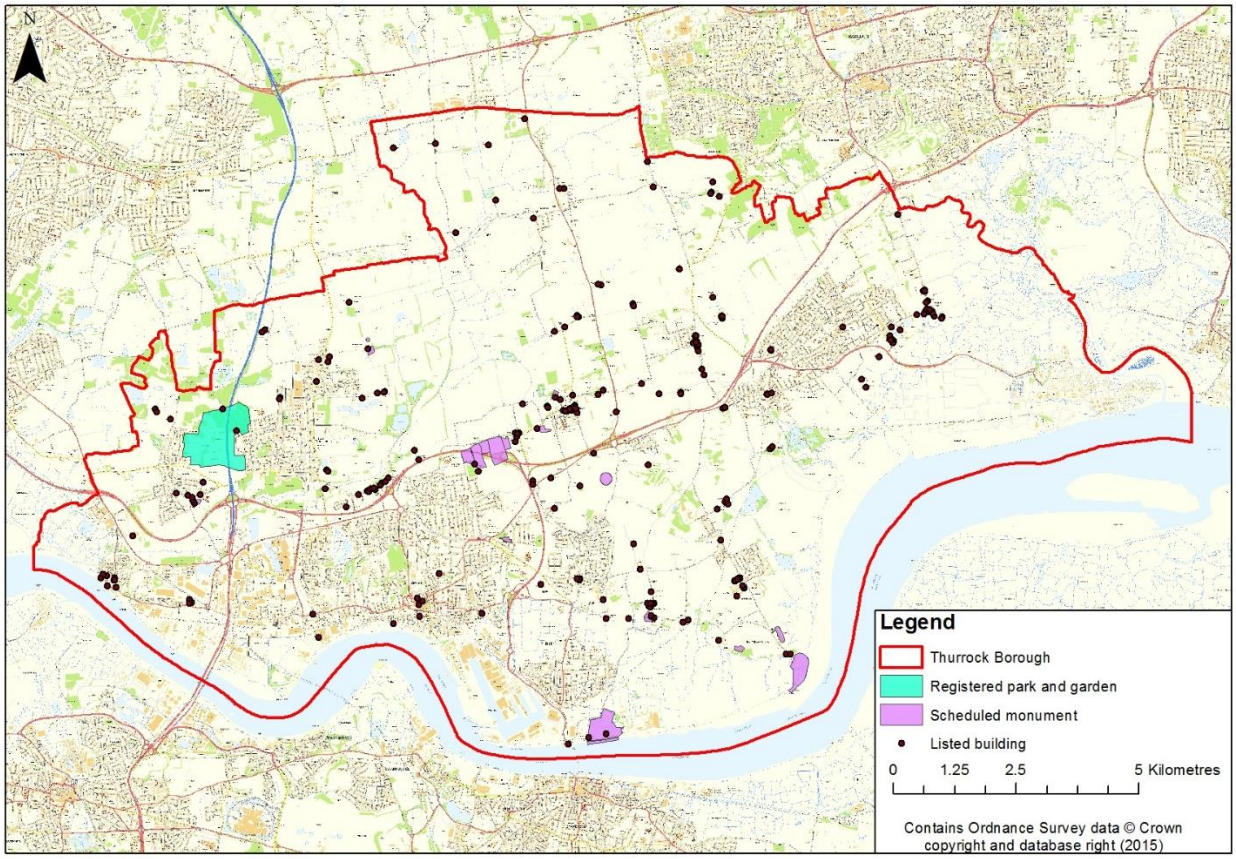

Figure 2-9: Historic assets in Thurrock

Historic England's 'Heritage at Risk Register' (Historic England, 2014) identifies two buildings, two archaeology entries and one conservation area as at risk. The archaeological entries are scheduled monuments, although they are not at risk from flooding. East Tilbury conservation area is described as in a 'very bad' condition. The listed buildings are not described as at risk by flooding, however Coalhouse Fort, Tilbury has a problem of water ingress to casemates (Historic England, 2014).

There is also the potential for unrecorded archaeology, including buried, waterlogged archaeological and palaeo-environmental remains of significant interest and fragility that can be associated with river valleys, floodplains and wetland areas.

There are many heritage assets within Thurrock, including designated and non-designated heritage sites. Non-designated heritage assets' protection is a requirement of the NPPF, therefore should be considered during implementation of the LFRMS actions.

2.8.1 Key environmental issues

Thurrock contains a wealth of historic assets. However, some of the most important of these sites are currently assessed as being under threat. There is a risk that adverse impacts upon aspects of Thurrock's cultural heritage could arise from flooding and increased flood risk in the future, whilst the construction and implementation of the flood risk management options selected by the LFRMS could also have adverse effects. Potential benefits may also arise from reduced flood risk to assets as a result of implementation of the LFRMS. However, new development within the setting of heritage assets is at risk of damaging the setting. Conversely, new development may offer opportunities for enhancing or better revealing heritage asset significance.

2.9 Population

The population of Thurrock is currently 157,705 (2011) (Thurrock Council, 2013) and is predicted to reach 183,200 in 2031, an increase of 34,300 (23%) over a 25 year period from 2006 (Thurrock Council, 2011a). This rapidly growing population is partly influenced by international immigration (Thurrock Council, 2011b).

Thurrock is expected to experience a significantly ageing population, as the proportion of people aged over 65 will increase by 13,800 people (75% increase) and people aged over 85 will more than double (141% increase) (Thurrock Council, 2011a). However, compared to the rest of England and Wales, Thurrock has a relatively young population, with an average age of 36, it is the eighth youngest in the east of England (Thurrock Council, 2014a). As a result of this younger age structure, Thurrock has a higher birth rate than the national and regional average of 14.8 births per 1000 population compared to 12.5 nationally and 11.62 regionally (Thurrock Council, 2013).

Thurrock has lower proportions of people from minority ethnic communities than the national average (Thurrock Council, 2011a). However, the ethnic profile of Thurrock has changed dramatically since 2000, as in the 2001 census the ethnic minority population was 4.7%, but in 2011 had increased to 19.1%. The largest minority group were Black/African/Caribbean/Black British comprising 7.8% of the local population (Thurrock Council, 2013).

2.9.1 Health

Estimated levels of adult smoking and obesity are worse than the England average, with the rate of smoking related deaths worse than the England average (Public Health England, 2014). Life expectancy is similar to the England average, however it is 8.2 years lower for men and 7.7 years lower for women in the most deprived areas of Thurrock in comparison to the least deprived areas (Public Health England, 2014). Life expectancy is rising for both men and women in Thurrock, as well as a reduction in early deaths (Public Health England, 2014). Obesity among children is an issue in Thurrock, with approximately 20.3% of Year 6 children classified as obese (URS, 2013).

There is an identified lack of a major centre providing integrated medical services, with the Core Strategy (Thurrock Council, 2011a) stating that the network of health centres throughout Thurrock needs to be progressively extended and upgraded. This critical social infrastructure, along with residential and nursing homes, would be put under more pressure if flood risk increased.

2.9.2 Deprivation

The Index of Multiple Deprivation (IMD) provides a measure of relative deprivation across England and was most recently published in 2010. Thurrock is ranked 146th out of 354 councils in England in 2010 (Department for Communities and Local Government, 2014), where one is the most deprived. This is an increase from 2007, where Thurrock was 124th. Pockets of deprivation are evident in some wards, with the most deprived being Tilbury St Chads, Grays, Belhus, Chadwell St Mary, Ockendon and West Thurrock (Thurrock Council, 2011b) (Figure 2-10). These areas represent 12% of Thurrock's population. Although deprivation is lower than average, about 22% (7,500) children live in poverty (Public Health England, 2014). Over 16% of Thurrock's working age population have no qualifications, compared with 10% nationally.

West Thurrock and South Stifford Ward has the highest percentage of properties with a high risk of flooding of all wards in Thurrock, where 5.3% of properties are at high risk. Grays Riverside Ward has 5.2% of properties with a high risk of flooding. Tilbury St Chads Ward has the highest percentage of properties with high IMD that have a high risk of flooding (3.3%). This rises to 23.5% with a medium risk of flooding in the ward. Grays Riverside Ward has the highest number of properties with high IMD at a high risk of flooding (141 properties). West Thurrock and South Stifford Ward and Tilbury Riverside and Thurrock Park Ward also have a high number of properties with high IMD and high flood risk. Remaining wards in Thurrock do not have any properties with high IMD with a high flood risk. High flood risk was determined by National Assessment of Flood Risk (NAFRA), where high (significant) flood risk is determined as more than 1.3% chance of flooding in any year at the location, or one in 75 chance of flooding in any given year (Environment Agency, 2009b).

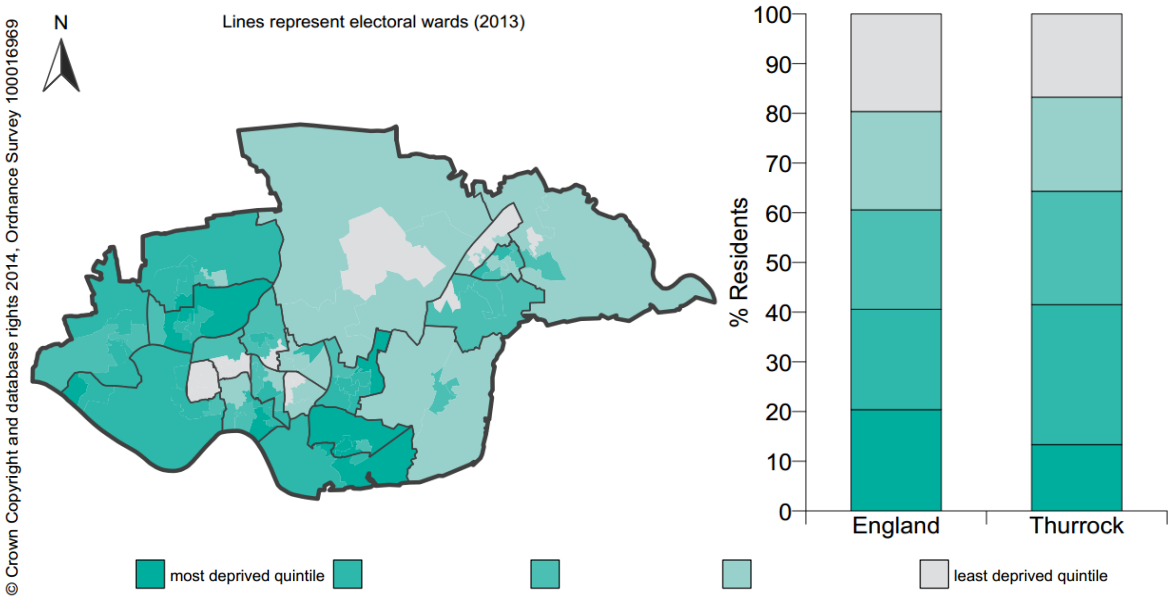

Figure 2-10: Thurrock deprivation (source: Public Health England, 2014). The chart shows the percentage of population in England and Thurrock who live in each of these quintiles.

2.9.3 Key environmental issues

The population of Thurrock is set to increase in the future and is predicted to comprise a significantly larger proportion of older people. The general health of the population is generally good, with increased life expectancy leading towards an ageing population. Health levels do vary across the borough, with poorer health linked to areas of higher social deprivation.

The growing population will have a substantial need for further housing and improved social, green and transportation infrastructure, as well as increased demand for water. Pressure on this infrastructure also arises from increased flood risk.

This growing population will place increased demand on a range of resources and the borough's water and sewerage infrastructure, which could be exacerbated by the effects of climate change. Linked to this may be increased demands for development and pressure on the existing housing provision, which may result in greater need for development in areas at risk of flooding.

2.10 Material assets

2.10.1 Economy

Historically, Thurrock was prosperous due to its riverfront, which became a strategic point for trade and industry. The decline in traditional industry has affected Thurrock, but regeneration, such as Thames Gateway, is presenting more opportunities (Thurrock Council, 2011b). Thurrock is within the Thames Gateway, which is the biggest of four growth areas outlined in the UK Government's Communities Plan 'Building for the Future', launched in 2003 (Thurrock Council, 2011a). The Thames Gateway is a national priority area for social and economic regeneration.

The employment rate for working age residents of Thurrock for 2008/2009 was 74.6%, which is in line with regional and national rates. Employment in Thurrock was projected to fall slightly between 2008 and 2013, but grow over the ten year period to 2018 (Thurrock Council, 2011b). In 2008, Thurrock had a distinctive jobs profile, with distribution, hotels and restaurants (including retail) providing almost 29% of employment in Thurrock. Public administration, education and health account for the second largest proportion with over 22%.

In 2012, the jobs profile had changed significantly with distribution, hotels and restaurants (including retail) provided almost 40% of employment, primarily due to the distribution functions centred at Tilbury and the retail located at Lakeside. There are 16.6% of people employed in public administration, education and health (URS, 2013).

2.10.2 Infrastructure

Thurrock occupies a strategic position in the East of England and enjoys good transport access to London (Figure 2-11). The M25 motorway and A13 road act as strategic cross roads 'of national importance' (Thurrock Council, 2011a). Regular rail services operate between London and Southend on Sea, serving seven stations and the Channel Tunnel Rail Link also passes through Thurrock. The Port of Tilbury provides international connections for both passengers and freight. Waste sites and utility services are also importance infrastructure within the borough, to which there is a risk of flooding.

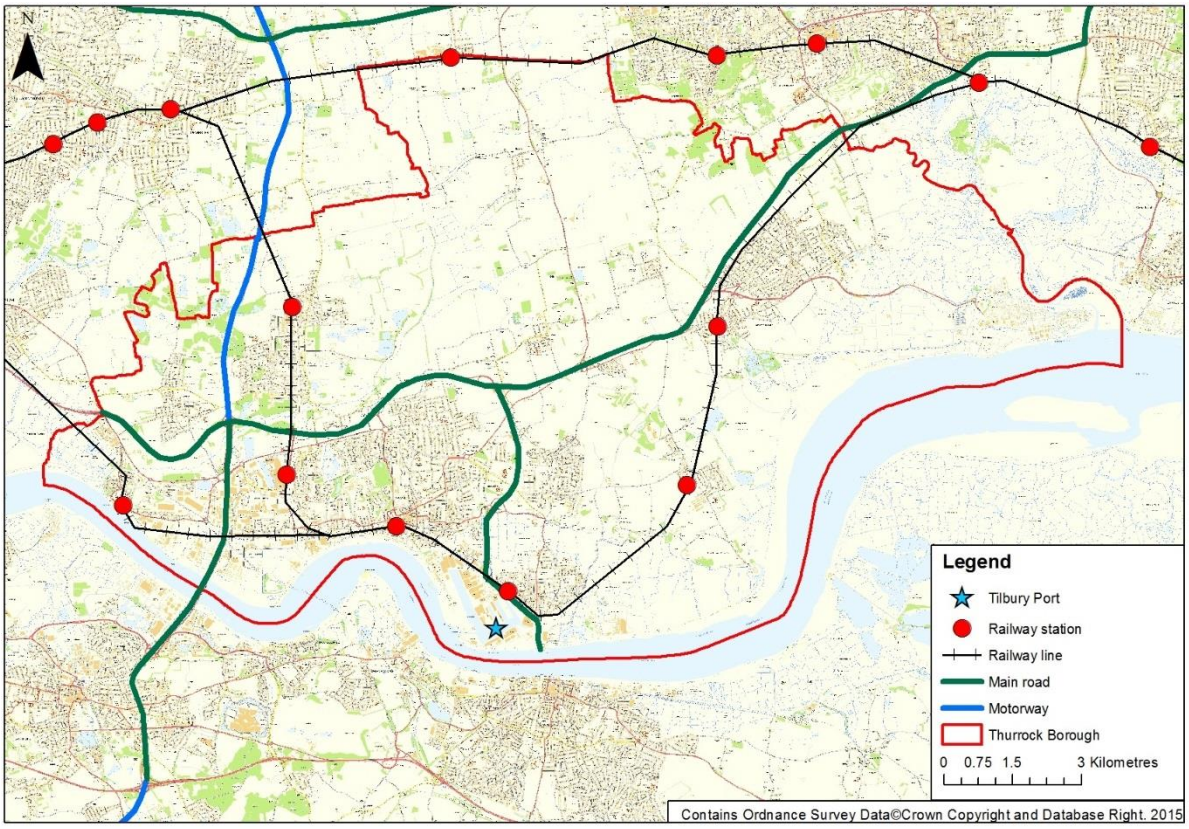

Figure 2-11: Transport infrastructure

There are a range of flood defences in Thurrock, both tidal and fluvial (Figure 2-12). Tidal defences mainly consist of raised reinforced concrete walls, steel walls or earth embankments. Fluvial flood defences includes small watercourse channels that provide protection. As shown on Figure 2-12, the majority of flood defences are Grade 2 or 3. Many of the defences that are in very poor condition (Grade 5) are close to Tilbury. Other defences of note are the Tilbury and Fobbing Barriers and Mardyke Sluice, along with the Tilbury Flood Storage Area. These flood defences are important flood infrastructure reducing the risk of flooding to Thurrock.

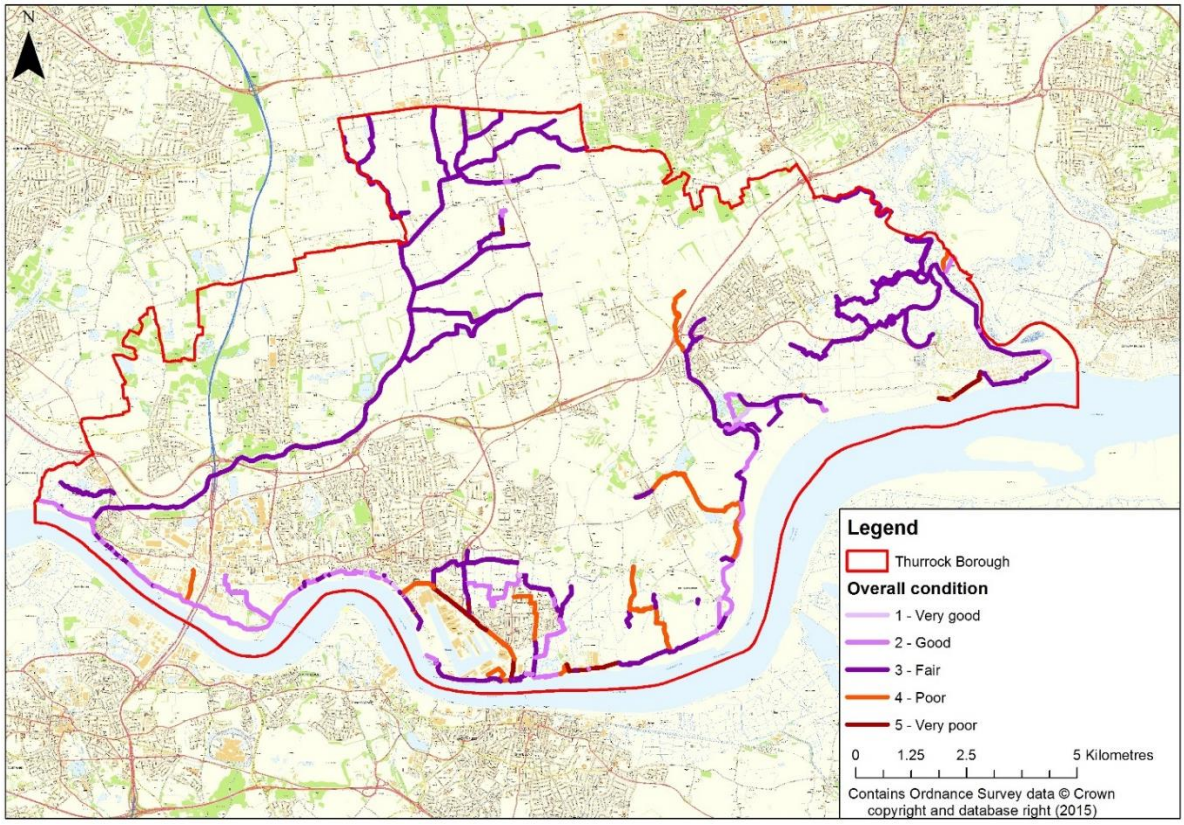

Figure 2-12: Flood defence locations and condition

2.10.3 Green infrastructure

Thurrock has more than 60% of its land in the Green Belt (Thurrock Council, 2011a). In 2007/8, only 59% of residents were satisfied with parks and open spaces in the borough, however, in March 2011 the area of green space was 515.9ha, compared to 80.9ha in 2010 (URS, 2013).

The South Essex Green Grid Strategy, which aims to create five green infrastructure projects in South Essex, includes the Thurrock Thameside Nature Park. Footpaths and cycleways are present in the park, which currently has an area of 49ha, although this will expand to 342ha once complete, likely to be 2016 (Essex Wildlife Trust, 2014b).

2.10.4 Key environmental issues:

The borough has good internal and external transport links, with further improvements planned. Predicted population increases and an ageing population will place greater pressure on the transport network, which could be exacerbated by an increase in future development pressure. In addition, development and commercial pressures are set to place increased demand on land availability, which will in turn affect the existing transport network.

The effects of a changing climate are predicted to result in increased disruption to transport infrastructure, waste sites and utilities services. Possible impacts include significant deterioration of road surfaces and reduced capacity of rail network due to hot track conditions (URS, 2013).

In addition, opportunities to create and enhance green infrastructure assets could be incorporated into flood risk management measures implemented as part of the LFRMS.

2.11 Air quality

Thurrock has identified areas where air quality objectives are exceeded, which have been designated air quality management areas (AQMA). There are 15 AQMAs in Thurrock, where air pollution levels from roads, industry and property is monitored. Traffic emissions, especially those from heavy goods vehicles, are the major contributor to poor air quality in most of these areas, despite the presence of large scale industry (Thurrock Council, 2015). These are found in the west of the borough, close to busy roads. These have been declared as a result of heavy traffic, primarily for nitrogen dioxide, with four AQMAs also included for PM_{10} as well (Essex Air, 2011).

Generally, air quality is not improving at the rate at which it was expected, due to increasing numbers of vehicles on the road (Essex Air, 2011).

2.11.1 Key environmental issues

Air quality in Thurrock is poor, particularly along major roads. Greater pressures on air quality may occur in the future through increases in the population of the borough, greater development and increased traffic congestion. This could lead to the designation of additional AQMAs to address local impacts on air quality. However, the LFRMS is not likely to impact on air quality in the borough, and any impacts, such as through increased flood risk management activity, are unlikely to be significant.

2.12 Climate

The climate of Thurrock is one of low rainfall, averaging about 600mm, with evapotranspiration averaging 380mm. Evapotranspiration mostly occurs during the summer months and exceeds rainfall totals over this period. However, winter rainfall and recharge provides the water required to offset this seasonal imbalance (Scott Wilson, 2009a).

Grays experiences a temperate climate with average maximum winter temperatures of eight degrees Celsius (°C) and minimum winter temperature of 1.6°C. Average maximum summer temperatures are 22.2°C, minimum 10.5°C. On average, winter rainfall in the region is between 36.7mm and 53.8mm, and summer rainfall between 41.1mm and 52.5mm (Met Office, 2015).

The UK Climate Projection (UKCP09) provides probability-based projections of key climate variables, such as temperature and rainfall at a higher geographic resolution than has previously been available. Projections are based on the Intergovernmental Panel on Climate Change's 'business as usual' emissions scenario. UKP09 projects that London's sea level will rise by 8.2cm by 2020 under a low emission scenario, rising to 11.5cm under a high emission scenario (UK Climate Projections, 2014).

Current projections point to significant and more variable temperature and rainfall levels in future, with greater peak temperatures and prolonged hot periods forecast. In general, Essex can expect warmer, wetter winters and hotter and drier summers, with extreme events more frequent. The low-lying land and geographical location on the Thames Estuary makes Essex and Thurrock vulnerable to various natural hazards, such as flooding and drought (Essex County Council, 2014).

Climate changes can affect local flood risk in several ways with impacts depending on local conditions. Wetter winters may increase river flooding with more intense rainfall leading to more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. Rising sea or river levels may also the increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses.

With rainfall frequency and intensity set to significantly increase in the coming decades, the likelihood of river flooding and overwhelming of drains and sewers will rise due increased surface runoff. This in turn will lead to localised flood events and increased erosion. To accommodate the increased likelihood of such events, the LFRMS must implement measures aimed at coping with them.

The LFRMS options, could potentially, both directly and indirectly, lead to an increase in greenhouse gas emissions as a result of construction and maintenance activities. Emissions could be reduced by selecting, sustainable building practices and materials. The NPPF states that local authorities should take account of climate change over the longer term, including flood risk and coastal change. Any new development should be planned to avoid increased vulnerability to the range of impacts arising from climate change, and as such, development should be directed away from areas at highest risk from flooding. Thurrock's SWMP (Thurrock Council, 2014b) assesses scenarios that include climate change, enabling the council to determine areas at a higher risk of flooding due to climate change.

Tidal flooding is included under the Thames Estuary 2100 Plan (Environment Agency, 2012), which advocates the following recommendations for the relevant policy units in Thurrock:

- "…a programme of floodplain management including flood warning, emergency planning, and localised flood protection and resilience for vulnerable key sites…"
- "…partnership arrangements and principles to ensure that new development in this zone is safe, and flood risk management is factored into the planning process at all levels…"

2.12.1 Key environmental issues

With rainfall frequency and intensity set to significantly increase in the coming decades, the likelihood of river flooding and overwhelming of drains and sewers will rise due increased surface runoff. This in turn will lead to localised flood events and increased erosion. To accommodate the increased likelihood of such events the LFRMS must implement measures aimed at coping with them.

If such climate change projections are realised, the adverse risk and impact toward Thurrock's infrastructure, public health and the natural environment has the potential to be great. With regard to the natural environment changing climate, mainly that of changing temperatures poses the biggest threat. Species and habitat abundance and richness will become threatened as a result of changing habitats, drier soils and increased competition from non-native invasive species throughout the borough's watercourses. Particularly vulnerable to climate change is the borough's wetland habitats, which are protected under a range of European designations.

Flooding derived from increased rainfall and storm events of greater severity is expected to result in significant adverse impacts on utility, residential and transport infrastructure with subsequent economic consequences. Damage to infrastructure at the forecasted extent will inevitably incur large economic costs as well as social and public health implications as a result of the distress and risk to disruption caused.

The LFRMS options, could potentially, both directly and indirectly, lead to an increase in greenhouse gas emissions as a result of construction and maintenance activities. Emissions could be reduced by selecting, sustainable building practices and materials that benefit flood risk and carbon emissions.

2.13 Scoping conclusions

Following a review of this environmental baseline data it was possible to scope out air quality as an SEA issue as it is unlikely that there will be a significant environmental impact on air quality in the borough from implementation of the LFRMS. A summary of the scoping conclusions are given in Table 2-5 below.

Table 2-5: SEA scoping assessment summary

Receptor	Scoped In / Out	Conclusion
Landscape and visual amenity	In	The landscape qualities and integrity of the borough could be affected by changes to flood risk or land use/management, including new development, whilst increased flood risk could impact on locally important urban and rural landscapes and landscape features. Flood risk management could potentially impact on local landscape features, potentially within the rural areas and other locally important landscape areas.
Biodiversity, flora and fauna	In	National and locally important biodiversity sites and species within the Borough, including SPA, Ramsar, SSSI, LNR and BAP habitats and species may be affected by the water environment and flooding. There is one SPA and Ramsar, a number of SSSIs and LNRs within Thurrock at risk from flooding or are water dependent. Future incidences of flooding could potentially change the underlying nature of habitats and the LFRMS policies may present opportunities for biodiversity gain. LFRMS measures could improve the river channel by removal of blockages, which would be of benefit to fish passage. Habitat creation or enhancement could also be incorporated into LFRMS measures, for example through the implementation of more natural flood risk management measures.
Water environment	In	Flooding has the potential to impact on water availability, the water quality of the watercourses within the borough and WFD objectives. There is the potential for indirect impacts on water dependent designated sites/species. Flood risk management measures could potentially affect the water environment both positively and negatively. The LFRMS could give rise to changes in flood risk and water quality, and could affect provision of water resources.
Soils and geology	In	Changes to flood risk could affect soil quality and underlying geology, which supports six geological SSSIs. Subsequent erosion of these lands could give rise to pollution pathways, increasing the risk of an adverse effect on other environmental receptors. Thurrock contains a significant percentage of high grade agricultural land. Flooding has the potential to erode soils and cause waterlogging impacting on agricultural productivity. Impacts on soil quality could then affect other aspects of the environment such as biodiversity and water quality.
Historic environment	In	Changes to flood risk could have positive or negative impacts on historic sites including scheduled monuments and listed buildings. This includes damage to the fabric of the structures through waterlogging or drought and impacts on their historic value or setting. There are a large number of historic assets in the borough that could be affected by changes to flooding and flood risk management measures. Opportunities may exist to protect important sites or negative impacts could occur due to increased flood risk to vulnerable sites.

Receptor	Scoped In / Out	Conclusion
Population	In	A range of socio-economic characteristics of the borough including social deprivation levels, health and wellbeing, access and recreation, and employment opportunities influence vulnerability to flooding. Critical social infrastructure, including hospitals, schools, and residential and nursing homes could benefit from reduced flood risk. The LFRMS has the potential to provide significant positive benefits to the population of the borough through reduced levels of flood risk to population generally and also vulnerable groups, and increased community resilience.
Material assets	In	Critical infrastructure including the transport network, waste sites, utilities services and emergency services could benefit from reduced flood risk. Conversely, increased flood risk to these sites could cause significant disruption to the borough, impacting on human and economic activity and the environment. Material assets could benefit from reduced flood risk, but the borough could be significantly affected by increased flood risk to these assets. Other assets include flood defence assets, which are required to be of a sufficient standard, which the LFRMS will address.
Air quality	Out	The LFRMS is not likely to have a significant effect on air quality in the borough due to the localised nature of any potential impacts.
Climate	In	Changes in flood risk could affect resilience to the potential impacts of future climate change. This could have knock-on effects on a range of environmental aspects including biodiversity, water resources, the local landscape and population, particularly deprived areas. Flood risk management measures could also result in increased carbon emissions associated with new development or increased management activities. The LFRMS may include mitigation, resilience and adaption responses and measures that could contribute to addressing the future impacts of climate change effects. Opportunities to improve climate change adaptation will be considered in the SEA.

3 SEA assessment framework

3.1 Introduction

The SEA framework is used to identify and evaluate the potential environmental issues associated with the implementation of the LFRMS. The framework comprises a set of SEA objectives that have been developed to reflect the key environmental issues identified through the baseline information review. These objectives are supported by a series of indicators, which are used as a means to measure the potential significance of the environmental issues and can also be used to monitor implementation of the LFRMS objectives. These LFRMS objectives are tested against the SEA assessment framework to identify whether each option will support or inhibit achievement of each objective. Table 3-1 below summarises the purpose and requirements of the SEA objectives and indicators.

Table 3-1: Definition of SEA objectives and indicators

	Purpose
Objective	Provide a benchmark 'intention' against which environmental effects of the plan can be tested. They need to be fit-for-purpose.
Indicator	Provide a means of measuring the progress towards achieving the environmental objectives over time. They need to be measurable and relevant and ideally rely on existing monitoring networks.

3.2 SEA objectives and indicators

SEA objectives and indicators have been compiled for each of the environmental receptors (or groups of environmental receptors) scoped into the study (see Table 2-5). The SEA objectives used to assess the LFRMS are given in Table 3-2 below.

Table 3-2: SEA objectives and indicators

Receptor	Objective		Indicator
Landscape	1	Protect the integrity of the Borough's urban and rural landscapes, and promote the key characteristics of the SLAs and Green Belt.	Changes in the condition and extent of existing characteristic elements of the landscape. The condition and quality of new characteristics introduced to the environment. Percentage of open countryside.
Biodiversity, flora and fauna	2	Protect and enhance designated and BAP habitats and species in the borough.	Area of designated sites adversely affected by flooding. Monitoring of reported status of designated nature conservation sites. Percentage of land designated as nature conservation sites as a result of LFRMS measures. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.
	3	Maintain and enhance habitat connectivity and wildlife corridors within the borough.	
	4	Maintain existing, and where possible create new, riverine and estuarine habitat to benefit migratory and aquatic species and fisheries, and maintain upstream access.	
Water environment	5	Improve the quality and quantity of the water and morphology in the borough's rivers.	Water quality and morphology of the borough's watercourses. Number of pollution incidents. Number of SuDS (Sustainable Drainage Systems) schemes installed as part of the LFRMS. Number and volume of Environment Agency licensed abstractions. Numbers of sites with high pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding.
	6	Do not inhibit achievement of the WFD objectives and contribute to their achievement where possible.	Achievement of WFD objectives. Percentage of water bodies achieving 'Good' ecological status/potential. No deterioration in WFD status.

Receptor	Objective		Indicator
Soils and geology	7	Reduce the risk of soil erosion and pollution.	Area of agricultural, rural and greenfield land affected by flooding or LFRMS measures. Numbers of sites with high pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding.
Archaeology and Cultural Heritage	8	Conserve and enhance the historic environment, heritage assets and their settings.	Number of heritage assets at risk from flooding, and assessment of impact. Number of vulnerable heritage assets protected from flooding by implementation of the LFRMS. Proportion of conservation area ground at risk of flooding. Number of designated and non-designated heritage assets harmed by FRM measures, including impacts on their settings.
Population	9	Increasing the resilience of people, property and businesses and critical infrastructure within Thurrock to the risk of flooding.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding.
	10	Increase the use of SuDS, particularly in all new developments.	Number of SuDS schemes installed as part of the LFRMS.
Material assets	11	Minimise the impacts of flooding to the borough's transport network and key critical infrastructure.	Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding.
Climate	12	Reduce vulnerability to climate change impacts and promote measures to enable adaptation to climate change impacts.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.

4 Strategy alternatives

4.1 Developing alternatives

The SEA Directive requires an assessment of the plan and its 'reasonable alternatives'. In order to assess reasonable alternatives, different strategy options for delivering the LFRMS have been assessed at a strategic level against the SEA objectives, and the environmental baseline as detailed in Section 2. The results of this assessment will be used to inform the decision-making process in choosing a preferred way of delivering the LFRMS.

4.2 Appraisal of actions to improve flood risk

The LFRMS has the purpose of managing and reducing local flood risk in the Thurrock Borough. The strategy objectives have been assessed against the SEA objectives for each of the following options as shown in Table 4-1.

1. **Do nothing**: where no action is taken and existing assets and ordinary watercourses are abandoned.
2. **Maintain current flood risk management regime**: where existing assets and watercourses are maintained as present in line with current levels of flood risk. Existing infrastructure is not improved over time and the effects of climate change are not taken into account; and
3. **Manage and reduce local flood risk**: take action to reduce the social, economic and environmental impact due to flooding.

Table 4-1: Assessment of the strategy and alternative options against the SEA objectives

SEA Objectives		Options and Effects		
		Do Nothing	Maintain current flood risk management regime	Manage and reduce local flood risk
1	Protect the integrity of the Borough's urban and rural landscapes, and promote the key characteristics of the SLAs and Green Belt.	Potential negative effect resulting from no management that could adversely impact on sensitive urban landscape character. However, abandonment of assets may allow for the development of a more natural watercourses, which may enhance the local landscape character of the borough, particularly in rural areas.	Little/no change to the baseline in the short to medium term. However, with increasing flood risk, negative effects could occur on sensitive urban landscape character, whilst positive effects may occur in rural areas as the borough's watercourses increasingly reconnect to their floodplain.	Potential for managing and promoting this objective through sensitively designed flood risk management schemes, which enhance local landscape character, historic assets and Green Belt land. Conversely, inappropriate management schemes could damage key landscape features and characteristics.
2	Protect and enhance designated and BAP habitats and species in the borough.	Potential for both adverse and beneficial impacts. For example, abandonment of assets may allow for the development of a more natural watercourse (enhancing certain notable species and habitats). However, there would be an increased risk of spreading non-native invasive species and potential impacts on water quality through increased flooding.	Little/no change to baseline in the short to medium term. Increased flooding in the future may provide opportunities for new habitat creation, but may also result in the spread non-native invasive species or adversely impact on habitats intolerant of increased inundation or changes in water quality.	Potential for both adverse and beneficial impacts as a result of active management. Opportunities may arise to enhance habitats and species through the implementation of multi-functional flood risk management measures, such as the provision of new green infrastructure.
3	Maintain and enhance habitat connectivity and wildlife corridors within the borough.	Potential for both adverse and beneficial impacts. Abandonment of assets would allow for corridors to develop that would be unrestricted by flood risk assets. However, the increased risk of spreading non-native invasive species would inhibit the biodiversity value of wildlife corridors.	Little/no change to baseline in the short to medium term. Increased flooding in the future may provide opportunities for new habitat creation, but may also result in the spread of non-native invasive species or adversely impact on habitats intolerant of increased inundation or changes in water quality.	Potential for both adverse and beneficial impacts as a result of active management. Opportunities may arise to enhance habitats and species through the implementation of multi-functional flood risk management measures, such as the provision of new green infrastructure.

SEA Objectives		Options and Effects		
		Do Nothing	Maintain current flood risk management regime	Manage and reduce local flood risk
4	Maintain existing, and where possible create new, riverine and estuarine habitat to benefit migratory and aquatic species and fisheries, and maintain upstream access.	Potential for both adverse and beneficial impacts. For example, existing habitat may deteriorate as a result of increased flooding (however, this will often depend on what the site is designated for) and blockages may occur due to the movement of sediment. However, abandonment of assets may allow a more natural riverine system to develop.	Little/no change to baseline. However as a result of increased flooding in the future due to climate change new habitats may be created or existing wetland habitats enhanced. However, habitats intolerant of increased inundation or changes in water quality may be adversely affected.	Potential for both adverse and beneficial impacts as a result of active management. Significant opportunities may exist for habitat creation as a result of implementing measures to reduce local flood risk. Conversely, the introduction of new assets may damage riverine habitat and introduce blockages for fish access to upstream watercourses if not implemented appropriately.
5	Improve the quality and quantity of the water in the borough's rivers.	Potential for both adverse and beneficial impacts. For example, abandonment of assets may allow for the development of a more natural watercourse and fewer assets are likely to reduce constrictions on water flow and hence water availability and quantity. However, there would be no management of water quality issues such as run-off, whilst flood risk to contaminated sites may increase, leading to increased surface and groundwater contamination.	Little/no change to baseline levels in the short to medium term. However, increased flood risk in the future may result in a reduction in surface water and groundwater quality due to contamination from surface water runoff or from contaminated sites.	Management of watercourses allows water quality to be monitored and potentially improved. Taking further action to reduce local flood risk may also improve water quality through reduced flood risk to potentially contaminated sites. However, the introduction of further flood risk assets to watercourses may result in constrictions to water flow, reducing water availability. Careful design and management of such assets can prevent these adverse effects.
6	Do not inhibit achievement of the WFD objectives and contribute to their achievement where possible.	Potential for both adverse and beneficial impacts. For example, abandonment of assets may allow for the development of more natural watercourses. However, there would be an increased risk of spreading non-native, invasive species through flooding and pollution to watercourses could become more widespread.	Little/no change to current measures to meet WFD objectives.	Potential for both adverse and beneficial impacts depending upon the specific statuses and objectives of the waterbody as identified in the RBMP. Opportunities for achieving WFD objectives may arise through the implementation of measures to reduce local flood risk.
7	Reduce the risk of soil erosion and pollution.	Potential negative effect on soil quality, particularly in areas of high land quality, resulting from increased erosion of soils from flooding and no management of land contamination risks and subsequent effects.	Little/no change to baseline. However, in the future, as a result of climate change, adverse impacts may arise through erosion and land contamination from increased flooding.	Potential for managing and promoting this objective through reduced flood risk.
8	Preserve and where possible enhance important historic and cultural sites in the borough.	Potential for both adverse and beneficial impacts. Historic environment assets and cultural heritage assets may be exposed to greater damage and deterioration through increased flood risk. Conversely, increased water inundation may help preserve some assets dependent on waterlogging, whilst the declining condition of flood risk management assets from no management and greater connectivity to the floodplain could improve the setting of historic assets.	Little/no change to baseline. However, in the future historic environment assets and cultural heritage may be exposed to increased flooding and damage due to climate change.	Potential for both adverse and beneficial impacts as a result of active management, for example through increased protection to vulnerable historic environment assets or improvements to their settings.

SEA Objectives		Options and Effects		
		Do Nothing	Maintain current flood risk management regime	Manage and reduce local flood risk
9	Minimise the risk of flooding to communities and social infrastructure.	Increased exposure to flood risk from a combination of no management and climate change. This could lead to a greater number of people and their properties at risk of flooding, causing greater damage and disruption, and increases in social exclusion, deprivation and health risks.	No improvements to health and well-being as existing risk maintained and risk may increase in the future as a result of climate change.	Active management to reduce local flood risk should help to protect residential properties and key social infrastructure services from flooding. This has the potential to create a range of social benefits including reducing associated health impacts and social deprivation.
10	Increase the use of SuDS, particularly in all new developments.	This option would result in no increase in the use of SuDS in the future. Surface runoff volumes would be likely to increase, further exacerbating flood risk events. In addition, the declining condition from no management of existing SuDS schemes and lack of additional schemes may reduce the ability to manage future impacts of climate change.	Little/no change to the baseline in the short to medium term. However, with increasing flood risk, the lack of additional SuDS schemes may reduce the ability to manage future impacts of climate change.	Active management to reduce flood risk may incorporate the greater use of SuDS schemes to reduce the rate and volume of surface water runoff. This will contribute to climate change mitigation and adaptation initiatives and can provide a range of other environmental benefits, including biodiversity enhancements and the provision of new recreation and amenity opportunities.
11	Minimise the impacts of flooding to the borough's transport network and key critical infrastructure.	This option is likely to result in increased flood risk to key infrastructure, which would cause significant disruption to the borough, impacting on human and economic activity and the environment.	This option would maintain the current risk levels, although risk may increase in the future as a result of climate change.	Flood risk management options may reduce flood risk to key critical infrastructure, reducing disruption during flood events and enabling a more effective response.
12	Reduce vulnerability to climate change impacts and promote measures to enable adaptation to climate change impacts.	This option would result in no active adaptation or response to climate change (specifically, flood risk management). This would lead to a risk of adverse impacts to all receptors in the short, medium and long-term. However, the loss of existing flood risk management assets may result in a greater reconnection of the river to its floodplain, which could benefit a range of habitats and species.	No adaptation or response to climate change in terms of flood risk management. High risk for adverse impacts to all receptors in the short, medium and long-term.	The LFRMS includes full consideration of climate change adaptation in terms of flood risk management. This will reduce the overall risk of flooding and the potential for flood damages in the short, medium and long-term future, benefiting both people and property.

The assessment described in Table 4-1 indicates that Option 1 (do nothing) is likely to result in a number of significant adverse impacts, particularly in relation to people and property, and other environmental assets including historic assets and biodiversity, where increased flooding may create new pathways for the spread of invasive non-native species. Surface water and groundwater quality could also be adversely affected, with increased flooding of contaminated sites leading to greater impacts on water resources. Conversely, increased flood risk may result in greater connectivity between watercourse and their floodplains, offering opportunities for habitat creation of benefit to a range of protected and notable species.

Option 2 (maintain current flood risk management regime) is likely to result in little or no change in the environmental baseline in the short to medium term as the existing flood risk management regime continues to maintain existing levels of flood protection. However, in the future, as a result of climate change, flood risk will increase, resulting in many of the impacts identified under Option 1, although potentially to a lesser extent and significance.

Option 3 (manage and reduce local flood risk) has the potential to provide a range of environmental benefits. Flood risk management initiatives, if designed and implemented in an appropriate manner, could have multiple benefits. This could include reducing flood risk to people and property, contributing to the protection of heritage assets and improvements in water quality, and providing new opportunities for habitat creation and the provision of recreation and amenity assets. Conversely, flood risk management measures, if implemented in an inappropriate manner, could result in adverse effects on a range of environmental features. However, this risk is managed through the preparation of this SEA and through the planning and consenting process, which is likely to require consideration of the sustainability of a project prior to its implementation. Therefore, it is evident that by doing nothing or maintaining current levels of management, there are likely to be detrimental effects on the SEA objectives, which are likely to be prevented by carrying out active flood risk management as proposed by the LFRMS.

4.3 Strategy objectives and measures

The following draft LFRMS objectives have been developed:

- Objective One: Reduce the likelihood and consequence of flooding, particularly from surface water, groundwater and ordinary watercourses.
- Objective Two: Identify any gaps where further studies are required so we can get a better understanding of the causes and effects of local flooding.
- Objective Three: Reduce the vulnerability of Thurrock, its residents and visitors to the detrimental effects of flooding.
- Objective Four: Establish clear roles, powers and responsibilities for Thurrock RMAs.
- Objective Five:
    i. Provide improved communication of clear information on local flood risk, appropriate responses and the responsibilities for us and our partners.
    ii. State what we and other RMAs cannot take responsibility for, and facilitate engagement of the public and stakeholders to take action.
- Objective Six: Improve co-operative working between all RMAs, including across administrative boundaries.
- Objective Seven: Improve natural habitat and the social environment through flood management schemes which provide multiple benefits.
- Objective Eight: Establish a strategic funding plan and programme so we identify priorities, secure funding for measures that are affordable and that wherever possible include provisions for contributions by those who benefit.

A number of actions have also been developed, these are contained in Table 5-4. The SEA appraises these objectives and actions to determine whether they would inhibit achievement of the SEA objectives, or conversely, contribute to their delivery.

5 Appraisal of LFRMS objectives to improve flood risk

5.1 Impact significance

The unmitigated impacts of the LFRMS objectives and actions on achieving the SEA objectives were identified through the analysis of the baseline environmental conditions and use of professional judgement. The significance of effects was scored using the five point scale summarised in Table 5-1. If a high level of uncertainty regarding the likelihood and potential significance of an impact (either positive or negative) was identified, it was scored as uncertain.

Table 5-1: SEA appraisal codes

Impact significance	Impact symbol
Significant positive impact	++
Minor positive impact	+
Neutral impact	0
Minor negative impact	-
Significant negative impact	--
Uncertain impact	?

Throughout the assessment the following approach was applied:

- Positive, neutral and negative impacts are assessed, with uncertain impacts highlighted.
- The duration of the impact are considered over the short, medium and long term.
- The reversibility and permanence of the impact are assessed (e.g. temporary construction impacts, impacts which can be mitigated against/restored over time or completely irreversible changes to the environment).
- In-combination effects are also considered.

5.2 LFRMS impacts assessment

Table 5-2 and Table 5-4 provide a summary of the outcomes of the environmental assessment of the draft LFRMS objectives and actions respectively. Table 5-3 shows the results of the assessment of cumulative effects of the LFRMS objectives on achievement of the SEA objectives, whilst Table 5-5 assesses the cumulative effects associated with the LFRMS actions.

These are qualitative assessments that identify the range of potential effects that the LFRMS may have on delivering the SEA objectives. Where a particular LFRMS objective is underpinned by a series of actions, each of which may give rise to a range of environmental effects, an overall impact has been identified for each SEA objective.

Table 5-2: Assessment of LFRMS objectives against SEA objectives

LFRMS objective ID	LFRMS objectives	SEA objective												Comments
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Reduce the likelihood and consequence of flooding, particularly from surface water, groundwater and ordinary watercourses.	+	+	0	0	0	0	0	0	++	+	++	++	This objective provides a significant positive effect on SEA objectives 9, 11 and 12 due to the increased protection it will provide from flooding on people and material assets, and as a result of reducing the risk of flooding will reduce vulnerability to climate change. There will be additional benefits to the population by decreasing the risk of health problems that arise from flooding, such as stress, and will also assist in the reduction of deprivation. There is a positive effect on SEA objective 10, as to achieve this objective it is likely that the use of SuDS will increase. Reducing the likelihood of flooding to the landscape will provide benefit to SEA objective 1, as it will protect the integrity of the borough's urban landscapes, and potentially to the rural landscapes. From this protection, there is potential for a positive effect on biodiversity, as reduction of flooding will reduce the amount of pollution entering the watercourses, therefore having favourable effect on habitats, particularly riverine BAP habitats and species. Although scored neutral due to the high level nature of the objective leading to a lack of information about how and where the objective will be delivered, there is potential for a positive effect on soils and geology, since reducing flooding will reduce the risk of soil erosion and pollution that flood waters can cause and mobilise. Scored neutral for reasons as explained above for SEA objective 7, the historic environment has the potential to be positively affected, and this LFRMS objective could provide particular benefit to the listed building Coalhouse Fort, which has a problem of water ingress to casemates. There is unlikely to be a negative effect on the historic environment, as no heritage assets that require waterlogged conditions have been identified. If there are these assets, negative effects can be mitigated by not protecting these from flooding, or providing the correct water levels. There is, however, the potential for negative effects on SEA objective 4, as FRM measures could reduce upstream access, therefore impacting on migratory and aquatic species, although it has been scored neutral due to the high level nature of the LFRMS objective. Risks can be mitigated through considerate design, such as fish passes. Another negative effect could arise from this LFRMS objective on SEA objectives 5 and 6, as increasing flood defences in, and potential modification of, watercourses could inhibit the achievement of WFD objectives for the watercourses as there may be a negative effect to the morphology of the watercourses. However, a reduction in flooding has the potential to reduce risks to water quality.
2	Identify any gaps where further studies are required so we can get a better understanding of the causes and effects of local flooding.	0	0	0	0	0	0	0	+	+	0	+	+	Improving the understanding of local flood risk across the borough has the potential to contribute to objectives 8, 9, 11 and 12 which focus on the reduction of flood risk to the built environment and communities, and adaptation to climate change effects. There is likely to be a neutral impact in relation to all other SEA objectives. Opportunities may exist in the future, as with better understanding and cooperation the natural environment could benefit from flood alleviation schemes that enhance biodiversity.
3	Reduce the vulnerability of Thurrock, its residents and visitors to the detrimental effects of flooding.	0	0	0	0	0	0	0	+	++	0	++	++	There is a significant positive effect on SEA objectives 9 and 11 as reducing vulnerability will directly lead to a reduction in risk of flooding to communities and assets at a strategic scale, which will also reduce the risk of flooding to historic assets. There is the potential to reduce economic and social effects since reducing vulnerability to flooding will reduce the chance of damage to property. Socially, this will reduce stress and anxiety. Reducing vulnerability to flooding will also assist in achieving a significant positive effect on SEA objective 12, as it will reduce Thurrock's vulnerability to the increase in risk of flooding caused by climate change.
4	Establish clear roles, powers and responsibilities for Thurrock RMAs.	0	0	0	0	0	0	0	0	+	0	+	+	This objective seeks to define roles, which will help to achieve effective FRM, therefore there is a positive effect on SEA objectives 9, 11 and 12. However, this is unlikely to have a direct effect on the remaining SEA objectives at a strategic scale, as the objective does not involve direct intervention.
5(i)	Provide improved communication of clear information on local flood risk, appropriate responses and the responsibilities for us and our partners.	0	0	0	0	0	0	0	+	+	0	+	+	This LFRMS objective contributes positively towards SEA objectives 8, 9, 11 and 12 because it minimises the risk of flooding by improving the co-ordination of response and recovery from flooding. There are neutral effects on the remaining SEA objectives as the objective does not aim to construct new flood defences, therefore the objective does not have an effect on the borough's environment.
5(ii)	State what we and other RMAs cannot take responsibility for, and facilitate engagement of the public and stakeholders to take action.	0	0	0	0	0	0	0	0	+	0	+	+	This objective seeks to improve public awareness of flooding and encourage people to be proactive in managing their own risk. It will therefore have a positive effect in relation to SEA objectives 9, 11 and 12. All other SEA objectives are unlikely to be affected by the objective.
6	Improve co-operative working between all RMAs, including across administrative boundaries.	0	0	0	0	0	0	0	0	+	0	+	+	This LFRMS objective contributes positively towards SEA objectives 9, 11 and 12 because it minimises the risk of flooding by improving the co-ordination of response and recovery from flooding. There are neutral effects on the remaining SEA objectives as the objective does not aim to construct new flood defences, therefore the objective does not have an effect on the borough's environment.
7	Improve natural habitat and the social environment through flood management schemes which provide multiple benefits.	+	++	++	++	++	++	+	+	++	+	++	++	There are positive effects towards all of the SEA objectives, as this reduces the risk of flooding to communities and the borough through schemes that will benefit biodiversity, which in turn will lead to an improvement in water quality and morphology.
8	Establish a strategic funding plan and programme so we identify priorities, secure funding for measures that are affordable and that wherever possible include provisions for contributions by those who benefit.	0	0	0	0	0	0	0	0	+	0	+	+	It is not clear what outcomes this LFRMS objective would be likely to deliver. However, it appears to support FRM actions that are more likely to be achievable due to affordability, and therefore reduce the risk of flooding to the borough and vulnerability to climate change, therefore having a positive effect on SEA objectives 9, 11 and 12. However, there is a risk that affordable measures are prioritised over measures that provide benefit to the wider environment such as biodiversity. Currently the remaining SEA objectives are neutral as the measures are not likely to have a strategic effect.

Table 5-3: Cumulative effects of the LFRMS objectives on SEA objectives

Receptor	SEA objective		Assessment score	Justification	Timescale, probability and permanence of effects
Landscape	1	Protect the integrity of the Borough's urban and rural landscapes, and promote the key characteristics of the SLAs and Green Belt.	+	Although most of the LFRMS objectives have a neutral effect on this SEA objective, positive effects have been identified from LFRMS objectives 1 and 7. There are no negative effects in relation to the LFRMS objectives. LFRMS objectives 1 and 7 seek to deliver improvements to the environmental quality of the borough through reducing flooding and increasing FRM scheme's scopes to include wider benefits.	These effects are likely to happen if FRM schemes are implemented in a way that give consideration to these LFRMS objectives, particularly LFRMS objective 7. The timescale and permanence of effects are dependent on the implementation of flood risk schemes, and type, scale and specific location of them. Effects may be limited, depending on the scale of the schemes. However, through influencing the type of FRM schemes that include wider benefits, effects could be long term and permanent rather than short term.
Biodiversity, flora and fauna	2	Protect and enhance designated and BAP habitats and species in the borough.	0	There is a generally a neutral effect on these SEA objectives, as most of the LFRMS objectives are concerned with communication and data gathering, therefore not having a direct impact on the natural environment. LFRMS objective 7 aims to improve the natural habitat, and therefore there are significant positive effects on SEA objectives 2, 3 and 4. There is potential for one negative effect on SEA objective 4 from LFRMS objective 1, which is concerned with reducing the likelihood of flooding, as FRM measures could reduce upstream access, therefore impacting on migratory and aquatic species. However, there is the potential for benefits to the riverine environment by installing sustainable FRM measures with fish passes and other measures. LFRMS objective 1 also has the potential for a positive effect on SEA objective 2, as reducing flood risk in urban areas and promoting better management of surface water runoff are likely to benefit water quality and water resources in the borough, by reducing the risk of contaminated materials, fuels, chemical and sediments from entering local watercourses.	The effects are likely to occur over a range of timescales, as it depends on the implementation of FRM measures. The LFRMS may influence development proposals in the short term and in the longer term, and the outcomes of this may be both temporary and permanent depending upon the location and scale of effects that are achieved. At this stage, the scale and permanence of any effects is generally uncertain as the LFRMS objectives encourage good design rather than expressly inhibiting bad design. This means that development could be consented that does not improve environmental quality. There are also many variables on the type of development, from geographic scale and location to the type of environmental receptors of the development. For positive effects to be more certain, a robust planning process that considers the LFRMS objectives is required.
	3	Maintain and enhance habitat connectivity and wildlife corridors within the borough.			
	4	Maintain existing, and where possible create new, riverine and estuarine habitat to benefit migratory and aquatic species and fisheries, and maintain upstream access.			
Water environment	5	Improve the quality and quantity of the water and morphology in the borough's rivers.	0	There is a generally a neutral effect on these SEA objectives, as most of the LFRMS objectives are concerned with communication and data gathering, therefore not having a direct impact on the natural environment. There is potential for a negative effect on SEA objective 6 from LFRMS objective 1, as constructing flood defences in, and potential modification of, watercourses could inhibit the achievement of WFD objectives. However, there is the potential for this to be balanced by LFRMS objective 7 which aims to improve the natural habitat, which would contribute towards WFD objectives.	
	6	Do not inhibit achievement of the WFD objectives and contribute to their achievement where possible.			
Soils and geology	7	Reduce the risk of soil erosion and pollution.	+	The LFRMS objectives have a generally neutral effect, however there is the potential for positive effects on this SEA objective as the LFRMS aims to reduce the risk of flooding to the borough. Reducing the risk of flooding will reduce the risk of contaminated materials, fuels, chemicals and sediments from entering watercourses, therefore having a positive effect on this SEA objective.	The effects are likely to occur over a range of timescales, as it depends on the implementation of FRM measures. The LFRMS may influence development proposals in the short term and in the longer term, and the outcomes of this may be both temporary and permanent depending upon the location and scale of effects that are achieved.
Archaeology and Cultural Heritage	8	Conserve and enhance the historic environment, heritage assets and their settings	+	The LFRMS objectives have a generally positive effect on this SEA objective as the LFRMS aims to reduce risk of flooding to the Borough. A reduction in risk of flooding within the Borough generally will reduce the risk of flooding to important historic and cultural assets, now and in the future. There are no LFRMS objectives that specifically aim to protect and enhance historical and cultural assets, which lessens the positive impact on this SEA objective, and therefore an overall minor positive effect has been identified. However, any FRM measure that is likely to impact on a historic or cultural asset should be fully assessed, as some assets may require waterlogged conditions for protection. Any development proposed should also be assessed individually as the development itself could affect the fabric or setting of a known or unknown historic asset.	The effects of the LFRMS are likely to occur over a range of timescales. However, the LFRMS seeks to deliver long-term flood risk benefits and so any historic assets protected may benefit in the longer term. The permanence of any effects will depend upon the specific details of the FRM measure being implemented and the nature, scale and location of this intervention.
Population	9	Increasing the resilience of people, property and businesses and critical infrastructure within Thurrock to the risk of flooding.	++	The LFRMS is likely to provide a significant positive effect in relation to this SEA objective. The majority of objectives seek to deliver improved FRM for local people, with LFRMS objectives 1, 3 and 7 perhaps the objective most focused on achieving this. Improving FRM and reducing flood risk across the borough could deliver a range of benefits to the local community including alleviating the cost and disruption associated with flooding, whilst reducing stress and anxiety associated with the risk of flooding. In addition, wider societal benefits could be achieved by reducing flood risk and improving the environmental quality of the borough. Benefits could include reduced social deprivation and greater community cohesion.	Most of the LFRMS objectives directly seek to reduce flood risk and therefore it is very likely that positive effects will occur. Given the range of objectives, it is also likely that effects will occur over a range of timescales and will include both temporary and permanent effects.
	10	Increase the use of SuDS, particularly in all new developments.	+	Although not specifically addressed within the LFRMS objectives, SuDS is likely to play an important role in achieving a number of the objectives to reduce flood risk, promote better land management and influence the quality of new development.	SuDS may play a role in the delivery of a number of the LFRMS objectives, particularly in relation to influencing the design and new development, and therefore it is likely that the LFRMS will contribute towards achieving this SEA objective. The timescale for achieving this is likely to vary depending upon the scale of development proposals and the resources available to deliver the LFRMS actions. The effects are likely to be permanent if SuDS schemes can be successfully incorporated into these new development proposals.
Material assets	11	Minimise the impacts of flooding to the borough's transport network and key critical infrastructure.	++	The LFRMS objectives are likely to have a significant positive effect on this SEA objective as many of the LFRMS objectives are aimed at reducing the risk of flooding to people and property, particularly LFRMS objectives 1, 3 and 7. Implementing FRM measures will reduce the risk of flooding to the borough, which will include a reduction in the risk of flooding to the Borough's transport networks.	The LFRMS includes a number of objectives to reduce flood risk and therefore it is very likely that positive effects will occur. Given the range of relevant LFRMS objectives, it is likely that effects will occur over a range of timescales.
Climate	12	Reduce vulnerability to climate change impacts and promote measures to enable adaptation to climate change impacts.	+	FRM measures that are introduced as a result of this LFRMS will consider climate change in their design, providing a positive effect on this SEA objective. However, measures to enable adaptation to climate change could be more expressly promoted within the LFRMS. Therefore the LFRMS only has a minor positive effect on this SEA objective.	The nature of the effects will be influenced by a wide range of factors outside the direct control of the LFRMS. Therefore it is difficult to predict at this stage the likely timescale, probability or permanence of effects. It is likely that effects will be achieved over a variety of timescales and their significance will be linked to the scale and nature at which climate change occurs. However, the LFRMS will promote better FRM and will reduce flood risk across the borough and there are significant drivers requiring climate change considerations to be built into these FRM actions. Therefore it is likely that the LFRMS will provide an important means for monitoring the flood risk effects of climate change and implementing actions to address these effects.

Table 5-4: Assessment of LFRMS actions against SEA objectives

Action				SEA objective												Comments
ID	What?	How?	Ward	1	2	3	4	5	6	7	8	9	10	11	12	
1	Raise **awareness of Areas of Critical Drainage (AoCD)** amongst Planners and influence planning policies to prevent the creation of new risk areas	Include Planners and planning policy influencers in awareness raising activities. Ensure AoCD information is clear and accessible.	All	0	0	0	0	0	0	0	0	+	0	+	0	These actions are focused on raising awareness of flooding amongst the population of Thurrock, including those that make or influence decisions on planning applications, therefore providing them with an understanding on how a development could potentially be affected by flooding. Raising awareness of flooding within the community will make the borough more resilient to flooding. The effects are likely to be small scale and localised, but will help to increase the resilience of people, property, business and infrastructure within Thurrock to the risk of flooding, therefore contributing to SEA objectives 9 and 11. In relation to other SEA objectives, the effects at a strategic scale are likely to be neutral as FRM actions are planned under these actions.
2	**Community awareness**	Increase awareness of flooding within communities at risk through newsletters, website, drop-in surgeries etc. To include information on who to contact during flooding, flood warning services and how to access them, how to prepare for flooding, as well as the role of Thurrock as LLFA.	All	0	0	0	0	0	0	0	0	+	0	+	0	
3	**Community awareness**	Update Council webpages to highlight the impact of fly tipping on flood risk.	All	0	0	0	0	0	0	0	0	+	0	+	0	
4	**Community awareness**	Provide information on Council webpages regarding importance of good drainage practice / drainage maintenance and promote to local landowners.	All	0	0	0	0	0	0	0	0	+	+	0	0	This action promotes the use of SuDS, therefore benefiting SEA objective 10. Promoting good drainage practices to local landowners will increase the resilience of Thurrock to flooding, thereby having a positive effect on SEA objective 9. However, the effects are likely to be localised, therefore the action likely to have a neutral effect on the remainder of the SEA objectives.
5	**Implement a standardised Asset Register**	Implement a standardised asset register. Educate departments involved in filling in the register Ensure everyone involved understands the register, its purpose and the methodology.	All	0	0	0	0	0	0	0	0	+	0	0	0	These actions are likely to have a neutral effect on all of the SEA objectives with the exception of a small scale positive effect on SEA objective 9, as it will increase the resilience of the borough to flooding. The effect will come from the asset register being up to date, which will increase understanding of how flooding is prevented in Thurrock and will also ensure assets are in good condition, therefore increasing resilience to flooding. However, such actions could have a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS. For example, biodiversity requirements should be considered to influence management actions, i.e. not clearing gullies if there is potential for biodiversity benefit.
6	**Implement a standardised Asset Register**	Undertake asset surveys. Check outfall conditions to local ditches to check whether they are clear or silted, sufficient size etc. Create GIS layer to highlight the location of all assets in the Borough, including areas acting as flood storage areas, and establish ownership/maintenance agreements.	All	0	0	0	0	0	0	0	0	+	0	0	0	
7	Improved **maintenance of drainage network**	Information from the asset surveys and register should be used to create a maintenance regime that prioritises key assets and drainage areas within budgets available.	All	0	0	0	0	0	0	0	0	+	0	0	0	
8	Ensure **drainage systems are operating at capacity** in AoCD	Review existing gully clearance / maintenance schedules and revise if necessary.	All	0	0	0	0	0	0	0	0	+	0	0	0	
9	Implement a **standardised flood incident log.**	Revise the incident log as required to incorporate more information. Develop a GIS/web-based database to create a spatial representation of the incidents logged	All	0	0	0	0	0	0	0	0	+	0	0	0	These actions aim to improve understanding of flood risk within the borough, and as such, this information will ultimately be used to inform FRM activities that are likely to increase resilience of Thurrock to flooding. The effects will be fairly localised. Potential effects on other SEA objectives relating to natural environment features are not clear at this stage.
10	**Investigate flooding records** and if necessary provide improvements to highways drainage.	Documented site visits following flood events. Data sharing with partners.	All	0	0	0	0	0	0	0	0	+	0	0	0	
11	**Runoff rates and volumes** for new small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be controlled.	For all new developments: The peak runoff rate for the 1 in 1 year and 1 in 200 year runoff must not exceed the peak greenfield runoff rate for the same event. The runoff volume for the development site in the 1 in 200 year, 6 hour rainfall event must not exceed the runoff volume for the same event.	All	0	0	0	0	+	0	+	0	+	++	0	0	These actions aim to reduce runoff in new developments, which is likely to be implemented by SuDS, therefore providing a significant benefit to SEA objective 10. Through implementing SuDS, there is the potential to have biodiversity benefits by providing new aquatic habitats. However, SEA objective 4 has been scored neutral due to no information about the new developments being available at present. Reducing the runoff is likely to increase the resilience of the borough to flooding in localised areas, having a positive effect on SEA objective 9. Reducing urban runoff will also benefit SEA objectives 5 and 7 as it will reduce pollution and therefore help to improve water quality. Introducing green roofs has the potential to provide new habitat, therefore having a beneficial effect on biodiversity. Green roofs may also add an interesting landscape feature, and therefore has the potential to protect the integrity of the borough's urban and rural landscapes (SEA objective 1). However, these objectives have been scored neutral as detail of these are unknown, as is the scale which may not be strategic.
12	**Runoff from development on previously developed sites** for small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be restricted to greenfield levels.	For previously developed sites the peak runoff rate (1 in 1 and 1 in 100 year) and volumes (1 in 100 year, 6 hour rainfall event) must not exceed the equivalent greenfield rates.	All	0	0	0	0	+	0	+	0	+	++	0	0	
13	**Green roofs/areas.**	Investigate opportunities to introduce green roofs/areas as and when sites become available for development.	All	0	0	0	0	0	0	0	0	+	++	0	0	
14	**Drainage infrastructure improvement**: rural roads.	Identify rural roads with no highways drainage and investigate installation of drainage ditches at the roadside to capture runoff.	All	0	-	0	0	0	0	0	0	0	0	0	0	This action aims to introduce drainage ditches on rural roads. There is a risk that it will be at the expense of hedgerows, which border the rural roads, therefore having a negative effect on SEA objective 2, which aims to protect and enhance designated and BAP habitats. Hedgerows are a designated BAP habitat under the Essex BAP. Effects are likely to be localised rather than strategic and significant, therefore it is a minor negative effect. However, this risk could be mitigated through the creation of new ditch habitat. It is unlikely that there will be any effects on the remaining SEA objectives, including SEA objective 9, as rural roads are not critical infrastructure.
15	**Drainage improvements**: planning policy.	Use planning policy and advice regarding paving of driveways, using residential soakaways, water butts etc. Develop policy to resist the paving over of driveways.	All	0	0	+	0	0	0	0	0	+	++	0	0	These actions aim to improve drainage in the borough by implementing SuDS, therefore providing a significant benefit to SEA objective 10. Stopping the reduction in the amount of green space available in the borough and introducing green verges will have a positive benefit on biodiversity, although minor due to the small scale. A way to strengthen positive effects on biodiversity will be to educate home owners on the benefit of having a front garden and how to improve their biodiversity potential. Reducing the runoff is likely to increase the resilience of the borough to flooding in localised areas, having a positive effect on SEA objective 9.
16	**Drainage improvements**: preferential flow paths.	Identify programme of potential preferential flow path works e.g. contoured grass verges.	All	0	0	0	0	0	0	0	0	+	++	0	0	

Action				SEA objective												Comments
ID	What?	How?	Ward	1	2	3	4	5	6	7	8	9	10	11	12	
17	Determine whether **current emergency response** to borough-wide surface water flooding is appropriate.	Review the Multi-Agency Flood Plan in the context of the SWMP mapping outputs with key partners including the Highways Agency and Network Rail	All	0	0	0	0	0	0	0	0	0	0	+	0	These actions aim to improve understanding of surface water flooding within the borough. With the key partners of the Highways Agency and Network Rail, there is a benefit to SEA objective 11, which aims to minimise the impacts of flooding to the borough's transport network. Providing the outputs to critical service providers will also minimise the impacts of flooding on the borough's key critical infrastructure, an aim of SEA objective 11.
18	Determine whether **services** (e.g. power, telecommunications) **are resilient to surface water flooding**.	Provide outputs from SWMP to critical service providers and meet to discuss the overall resilience of service across the Borough.	All	0	0	0	0	0	0	0	0	0	0	+	0	
19	Look for opportunities to **reduce flood risk to critical infrastructure** whilst upgrading the existing drainage infrastructure.	Review SWMP outputs in relation to critical infrastructure	All	0	0	0	0	0	0	0	0	0	0	+	0	
20	**Developers to demonstrate compliance with National Planning Policy**	Development control policy to ensure developers demonstrate compliance with NPPF by ensuring development will remain safe and will not increase risk to others, using more detailed integrated hydraulic modelling if required.	All	0	0	0	0	0	0	0	0	0	0	0	0	Overall, this action does not have any effect on the SEA objectives as it does not include any specific activities to reduce flood risk. It is likely to eventually lead to a positive effect on SEA objectives 9 and 11 increasing resilience of the borough to flooding, however this is not included as an effect the SEA objectives due to the uncertain nature and timescales at which benefits will occur. However, any FRM activities arising from this action could have a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS.
Areas of Critical Drainage (AoCD) Specific Actions																
21	**A13 drainage capacity.**	Highways Agency / Anglian Water to check on pumps and network at A13 to confirm condition. Confirmation of maintenance regime to Thurrock Borough Council.	Aveley & Uplands	0	0	0	0	0	0	0	0	0	0	+	0	There is likely to be a positive effect on SEA objective 11 as these actions aim to minimise impacts from flooding on the borough's transport network and other critical infrastructure through undertaking reviews from which activities can be based. The action is not expected to have an effect on the remaining SEA objectives.
22	**A13 emergency diversion procedures.**	Highways Agency to confirm A13 emergency diversion procedures.	Aveley & Uplands	0	0	0	0	0	0	0	0	0	0	+	0	
23	**Improvements to drainage infrastructure**: Purfleet Industrial Park / Milehams Yard.	Survey of the series of 300mm and 225mm diameter culvert crossings at Purfleet Industrial Park and Milehams Trading Estate.	Aveley & Uplands	0	0	0	0	0	0	0	0	0	0	+	0	
24	**Improvements to drainage infrastructure**: Purfleet Industrial Park / Milehams Yard.	Thurrock Council to liaise with RSPB at Aveley Marshes to establish water levels in the marsh. RSPB to show that any changes in levels will have no impact on local surface water regime.	Aveley & Uplands	0	0	0	0	0	0	0	0	0	0	0	0	This action has scored neutral on SEA objectives 1, 2, 4 and 5, as detail about this action is currently unknown. This also applies to the other SEA objectives. However, there is potential for this action to provide the opportunity to better manage water levels within the marshes in a way that will benefit biodiversity.
25	**Improvements to drainage infrastructure**: Purfleet Industrial Park / Milehams Yard.	Commission drainage studies to confirm where there are alterations in ground levels which may be causing the local gravity system to fail. Results to be used to confirm a way forward e.g. maintenance of existing system or installation of a new drainage network.	Aveley & Uplands	0	0	0	0	0	0	0	0	+	0	0	0	This action is likely to provide a positive effect on increasing flood resilience of the borough, although these effects are likely to be localised. It is unlikely that this action would immediately cause any effects on the other SEA objectives at a strategic scale. However, any FRM activities arising from this action could have a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS.
26	Ensure any development at the Ponds Farm Development provides a **betterment on the existing drainage system.**	Planning policy and information on SuDS.	Aveley & Uplands	0	0	0	0	0	0	0	0	+	+	0	0	This action could be implemented by the introduction of SuDS into the Ponds Farm development, therefore having a positive effect on SEA objective 10. Improved drainage will also increase resilience to flooding by the local businesses, providing benefit to SEA objective 9. However, any FRM activities arising from this action could have a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS.
27	**Emergency plan for AoCD003**	Highways team liaise with Emergency Planning team to ensure that an emergency plan is in place for road closures at this location.	West Thurrock & South Stifford	0	0	0	0	0	0	0	0	+	0	0	0	This action is likely to increase the borough's resilience to flooding, having a positive effect on SEA objective 9. It is not expected that there will be any effects on the remaining SEA objectives as this action does not include specific activities that will affect the natural environment.
28	**Drainage investigation** at the A126 junction.	Thurrock Council to liaise with Anglian Water and Lakeside re the A126 flood risk area. If under capacity, investigate options to install pumps or soakaways to alleviate flood risk.	West Thurrock & South Stifford	0	0	0	0	0	0	0	0	+	0	+	0	It is likely that this action will lead to a reduction in flood risk in the A126 flood risk area, therefore having a positive effect on SEA objectives 9 and 11. The effect is not expected to be significant due to the relatively small area that will be effected. It is unlikely FRM activities as a result of this action would have a negative effect on the natural environment in this location as it is already a developed urban area. However, any activities should be assessed if there were to be a negative effect on the natural environment, such as habitat corridors that may be present.
29	Ensure any development at Hadley Avenue provides a **betterment on the existing drainage system**	Planning policy and information on SuDS.	West Thurrock & South Stifford	0	0	0	0	0	0	0	0	+	+	0	0	This action could be implemented by the introduction of SuDS into the Ponds Farm development, therefore having a positive effect on SEA objective 10. Improved drainage will also increase resilience to flooding by the local businesses, providing benefit to SEA objective 9. However, any FRM activities arising from this action could have a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS.
30	**Drainage maintenance**: AoCD004	Liaise with Network Rail to review their maintenance programme for drainage ditches in their ownership running alongside the railway line.	West Thurrock & South Stifford	0	0	0	0	0	0	0	0	0	0	+	0	This action is likely to lead to an improvement in flood risk to transport assets within the borough, therefore scoring a positive effect on SEA objective 11.

Action				SEA objective												Comments
ID	What?	How?	Ward	1	2	3	4	5	6	7	8	9	10	11	12	
31	**Drainage investigation**: AoCD004.	Liaise with Anglian Water to confirm network capacity within this AoCD. If there is capacity, Thurrock Council to consider adding more gullies to increase the volume of water entering the network during a storm event.	West Thurrock & South Stifford	0	0	0	0	0	0	0	0	+	0	0	0	This action increases the resilience to flooding within the borough by removing flood waters from affected areas quickly, therefore having a positive effect on SEA objective 9. Adding more gullies within the borough has the potential to have a negative effect on SEA objective 7, as it could change or increase erosion. This could lead to a negative effect on habitats within the borough, by creating gullies in important habitat connectivity areas. There is also potential for a negative effect on SEA objective 5, as increasing runoff from areas could reduce the quality of water and morphology of the borough's rivers, particularly if it were to lead to more contaminated surface run off from roads entering the river network. It has been scored as neutral as it is unknown how this action will be implemented, and therefore what the effects will be. There is however an opportunity to create wildlife corridors within the gullies by creating more natural gullies. Due to the balance between potential risks and opportunities, the SEA objectives have been scored neutral.
32	**Preferential flow paths**: Hathaway Road.	Investigate the use of swales/French drains to attenuate and infiltrate runoff along Hathaway Road and reduce volumes of water ponding behind the rail embankment.	Chafford & North Stifford	0	0	+	0	0	0	0	0	+	++	+	0	The use of swales would provide a significant benefit to SEA objective 10, as it will directly introduce SuDS. The use of swales will provide new habitat opportunities, and therefore SEA objective 3 has been scored positive. If French drains were to be used, it would provide less of a positive effect as they are not as natural as swales. The introduction of improved drainage will increase resilience of the area and transport network to flooding, therefore having a positive effect on SEA objectives 9 and 11, although the effects are localised. It is unlikely that there will be any effects on the remaining SEA objectives as the area is urban, thereby reducing the amount of natural environment in the area. However, opportunity arises to improve water quality of runoff through the use of swales.
33	**Storage Area**: Grays Park.	Undertake a detailed drainage study at Grays Park to confirm potential to create preferential flow paths and water storage in the park.	Chafford & North Stifford	0	+	+	+	0	0	0	0	+	+	0	0	Providing water storage in the park also presents benefits to SEA objectives 2, 3 and 4, as there is opportunity to possibly create new habitat that could benefit estuarine or migratory species and ponds are a HAP within the Essex BAP. This will also enhance habitat connectivity. There is a risk of negative effects on the BAP mudflats that are present on the waterside edge of the park if any activities are undertaken. Introducing water storage will mean an introduction of SuDS, while also increasing resilience of the local community to flooding.
34	**Capital scheme**: storage area on recreation ground near to Stifford Primary School.	Undertake feasibility study to investigate the potential to create a small storage area on recreation ground near to Stifford Primary School to help reduce flows to the south that pool behind the railway embankment.	Chafford & North Stifford	0	+	+	0	0	0	+	0	+	+	0	0	Creating a storage area on the recreation ground provides the opportunity to improve BAP habitat, habitat connectivity and wildlife corridors within the borough, therefore having a positive effect on SEA objectives 2 and 3. This action is also likely to reduce erosion and pollution within the area, therefore having a positive effect on SEA objective 7. There will be benefits to SEA objectives 9 and 10 by reducing the risk of flooding and potential implementation of SuDS.
35	**Preferential maintenance regime**: AoCD006 (west).	Implement a preferential maintenance regime along roads to the west of the AoCD (including Roseberry Road, Castle Road & Belmont Road) to ensure that all flow is entering the drainage channels and not flowing over the road surface.	Chafford & North Stifford	0	0	0	0	0	0	0	0	+	0	0	0	This action is localised and small-scale, therefore there are neutral effects on all of the SEA objectives with the exception of SEA objective 9, as this action is likely to increase the local community's resilience to flooding and therefore have a positive effect.
36	**Drainage maintenance and improvement**: Florence Close.	Thurrock Council to liaise with Anglian Water to investigate potential to increase capacity of local drainage network in the vicinity of Florence Close by increasing gulley numbers. Need to confirm if there is capacity within the network and preferred approach.	Chafford & North Stifford	0	0	0	0	0	0	0	0	+	0	0	0	This action increases the resilience to flooding within the borough by removing flood waters from affected areas quickly, therefore having a positive effect on SEA objective 9. There is potential for a negative effect on SEA objective 3, as the construction of gullies could damage the limited amount of habitat surrounding Florence Close. However, the habitat in this area is not designated as BAP, therefore the effect would not be significant. There is also potential for a negative effect on SEA objective 5, as increasing runoff from areas could reduce the quality of water and morphology of the borough's rivers, particularly if it were to lead to more contaminated surface run off from roads entering the river network. There is however an opportunity to create wildlife corridors within the gullies by creating more natural gullies. Due to the balance between potential risks and opportunities, the SEA objectives have been scored neutral.
37	**Storage Area**: Hollowfield Avenue.	Thurrock Council to investigate potential for storage areas on land located within school playing field and sports ground.	Little Thurrock Rectory	0	+	+	+	0	0	+	0	+	+	0	0	Creating a storage area on the sports ground provides the opportunity to improve BAP habitats, habitat connectivity, wildlife corridors and increase aquatic habitat within the borough, therefore having a positive effect on SEA objectives 2, 3 and 4. This action is also likely to reduce erosion and pollution within the area, htereby having a positive effect on SEA objective 7. There will be benefits to SEA objectives 9 and 10 by reducing the risk of flooding and potential implementation of SuDS.
38	**Improvements to drainage infrastructure**: Hollowfield Avenue.	Increase the number of gullies connecting to Anglian Water Drainage network (there is a 1350mm diameter pipe in this location which may have the potential to alleviate flooding.	Little Thurrock Rectory Little Thurrock Blackshots Grays Thurrock	0	0	0	0	0	0	0	0	+	0	0	0	This action will increase resilience of the local area to flooding. There is a risk of a negative effect on SEA objective 3, as the construction of gullies could damage the limited amount of habitat surrounding Hollowfield Avenue. There is deciduous woodland BAP 175m to the east of Hollowfield Avenue, located within the cemetery. If construction was to be carried out close to this habitat there is potential for an adverse effect on biodiversity.
39	**Preferential flow paths**: Balfour Road / Whitehall Road.	Creation of preferential flow paths to control overland flow.	Little Thurrock Rectory Little Thurrock Blackshots Grays Thurrock	0	0	+	0	0	0	0	0	+	+	0	0	This action will enhance the resilience of Thurrock to flooding, however only at a localised scale. There are neutral effects on this action as there is no detail on how the preferential flow paths will be created. However there are no sensitive features in this area, reducing the likelihood of any effects from this action. Creating preferential flowpaths could be achieved through the introduction of SuDS, therefore having a positive effect on SEA objective 10. SuDS has the potential to create new habitat opportunities, therefore having a positive effect on SEA objective 3.
40	**Drainage infrastructure improvement**: AoCD008.	Thurrock Council to liaise with Anglian Water to investigate possibilities of connection to 1500mm diameter pipe to alleviate standing water problems.	Tilbury Riverside & Thurrock Park	0	0	0	0	0	0	0	0	+	0	0	0	This action has a neutral effect on the majority of the SEA objectives as it is unknown where the pipe will be installed and therefore what effects there will be. There is a positive effect on SEA objective 9 as this action will reduce the risk of flooding to people and property.

Action				SEA objective												Comments
ID	What?	How?	Ward	1	2	3	4	5	6	7	8	9	10	11	12	
41	**Confirm and map ownership and maintenance and identify 'mis-connections'** to the highway drainage.	Reference to Council records, liaison with Environment Agency, Anglian Water and landowners. Process will be used to obtain information and potentially enforce maintenance of drainage assets.	Tilbury Riverside & Thurrock Park	0	0	0	0	0	0	0	0	+	0	0	0	These actions are likely to have neutral effect on all of the SEA objectives with the exception of a small scale positive effect on SEA objective 9, as it will increase the resilience of the borough to flooding. The effect will come from the asset register being up to date, which will increase understanding of how flooding is prevented in Thurrock and will also ensure assets are in good condition, therefore increasing resilience to flooding. However, such actions could have a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS.
42	**Improvements to drainage infrastructure**: AoCD009	Undertake assessment of drainage infrastructure outfalling to local drainage ditches. If there is not sufficient capacity within the system the potential for on-line attenuation prior to outfall into the watercourses should be investigated.	Tilbury St Chads East Tilbury Chadwell St Marys Little Thurrock Rectory	0	0	0	0	0	0	0	0	+	0	0	0	
43	**Improvements to drainage infrastructure**: AoCD009	Thurrock Council to provide support to residents through creation of preferential flow paths or property level protection where local ground levels have altered and changed the flow regime.	Tilbury St Chads East Tilbury Chadwell St Marys Little Thurrock Rectory	0	0	0	0	0	0	0	0	+	0	0	0	This action will increase Thurrock's residents' resilience to flooding by providing property level protection. However, the action is only small scale, and therefore will not have a significant effect on SEA objective 9. It is not expected that the measures will have an effect on the remaining SEA objectives due to the small scale of the action.
44	**Network rail culverts**: AoCD009	Liaise with Network Rail to ensure culverts are appropriately sized and are being maintained.	Tilbury St Chads East Tilbury Chadwell St Marys Little Thurrock Rectory	0	0	0	0	0	0	0	0	0	0	+	0	Ensuring culverts are functioning properly will help to minimise the impact of flooding on the railway network, therefore having a positive effect on SEA objective 11. Introduction of additional culverts could have a negative effect on biodiversity, however at this early stage it is not clear if the action will involve additional culverts.
45	**Anglian Water adoption of foul and surface water sewer network** in this AoCD	Thurrock Council and Anglian Water to meet to discuss adoption of both foul and surface water sewer network in this AoCD. Ensure a separate surface water and foul water system is provided as part of any new development and is adopted by Anglian Water.	East Tilbury	0	0	0	0	+	0	+	0	+	0	0	0	There is likely to be a positive effect on SEA objectives 5 and 7 as segregation of sewer networks will improve water quality and reduce pollution. This action will also have positive effect on SEA objective 9 as it will reduce the risk of flooding. There is a concentration of listed buildings on Bata Avenue in East Tilbury, therefore consideration should be given to these buildings before any construction begins.
46	**Asset survey of surface water ditch**: AoCD010.	Surface water ditch in the south eastern corner of East Tilbury contains all of the town's surface water drainage; ownership and maintenance responsibilities are unknown. If ownership cannot be confirmed, Thurrock Council to consider adopting this network.	East Tilbury	0	0	0	0	0	0	0	0	0	0	0	0	This action has a neutral effect on all of the SEA objectives as it does not include specific action to reduce flood risk or intervention within the environment.
47	**Source control SuDS**: north A13.	Investigate potential for detention basin on farmland to the north of the A13.	Orsett	0	+	+	0	0	0	0	0	+	0	+	0	Creating water storage on farmland provides the potential to create new BAP habitat that will benefit the habitat and wildlife connectivity of the borough, while also providing positive effects on reducing flood risk to community and the transport network. However, creation of the detention basin should avoid the BAP habitats of deciduous woodland and traditional orchards in the area.
48	**Surface water network capacity improvements**: AoCD01.	Ensure new development in AoCD11b invests in the local surface water network which is currently at capacity.	Stanford-le-Hope West Orsett	0	0	0	0	0	0	0	0	+	+	0	0	This action will increase the local area's resilience to flooding, and has the potential to introduce SuDS, therefore having a positive effect on SEA objectives 9 and 10. However, due to the proximity of the Thames Estuary and Marshes SPA and Ramsar, such actions could have a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS.
49	**Asset survey and maintenance responsibilities**: Prospect and Valmar Avenues	Liaise and educate residents of Prospect and Valmar Avenue regarding their riparian responsibilities regarding the culvert/ditch to the rear of their properties.	Stanford-le-Hope West	0	0	0	0	0	0	0	0	+	0	0	0	This action will help to reduce flood risk for these residents, therefore the effect is localised. There is an opportunity to include responsibilities that will benefit the habitats that may be present in the ditch at the rear of the properties, and care should be taken to reduce negative effects from the maintenance of the ditch.
50	**Improvements to drainage infrastructure**: Runnymede Road recreation ground	Identify recreation ground as a surface water flood storage area in asset register. Complete condition survey of the outfall from the recreation ground and confirm how it reconnects to the Stanford Brook. Undertake any required remedial action.	Stanford-le-Hope West	0	0	0	+	0	0	0	0	+	0	0	0	The majority of Runnymede recreation ground is designated as deciduous BAP habitat, therefore any action to introduce surface water would need to avoid an adverse effect on this BAP habitat. New water storage will provide benefit to biodiversity through the introduction of a new wildlife habitat, therefore having a positive effect on SEA objective 4. Due to the risks and benefits from this action, SEA objectives 2 and 3 have been scored neutral. This action will increase resilience of the local area to flooding, having a positive effect on SEA objective 9.
51	**Source control SuDS**: Butts Lane	Liaise with local landowners to confirm maintenance regime of the brook flowing west-east to the north of the built up area and south of the A13 junction. Consider options to slow the flow of the channel. Investigate the creation of a bund to contain water in the open land, reducing overland flow and flooding on Butts Lane.	Stanford-le-Hope West	0	0	0	+	0	+	0	0	+	+	0	0	This action will help to reduce flood risk for these residents (SEA objective 9), therefore the effect is localised. There is an opportunity to include responsibilities that will benefit the habitats that may be present in this ditch at the rear of the properties, and care should be taken to reduce negative effects from the maintenance of the ditch. Creating a storage area will also reduce the risk of flooding, while also providing the potential to create new riverine habitat, therefore having a positive effect on SEA objective 4. There is also a positive effect on SEA objective 6 as this action could naturalise the river channel, therefore contributing towards improving the WFD status of the waterbody and achievement of the WFD objectives. There is also a positive effect on SEA objective 10 from the implementation of SuDS.

Action				SEA objective												Comments
ID	What?	How?	Ward	1	2	3	4	5	6	7	8	9	10	11	12	
52	**Asset register**: open land in Stanford-le-Hope	Open land in Stanford-le-Hope and Runnymede recreation ground act as flood storage areas; these should be identified as such in the asset register and highlighted to development control teams. Any development in these areas would require level for level floodplain compensation.	Stanford-le-Hope West Orsett	0	0	0	+	0	0	0	0	+	+	0	0	The majority of Runnymede recreation ground and open ground near Chantry Crescent is designated as deciduous BAP habitat, therefore any action to introduce surface water would need to avoid an adverse effect on this BAP habitat. New water storage will provide benefit to biodiversity through the introduction of a new wildlife habitat, therefore having a positive effect on SEA objective 4. Due to the risks and benefits from this action, SEA objectives 2 and 3 have been scored neutral. This action will increase resilience of the local area to flooding, having a positive effect on SEA objective 9. There is also a positive effect on SEA objective 10 from the implementation of SuDS.
53	**Improvements to drainage maintenance**: Victoria Road Brook	Confirm with EA the maintenance regime for Victoria Road Brook. If low priority, work with local community to help maintain the brook.	Stanford-le-Hope West	0	0	0	0	0	0	0	0	+	0	0	0	This action will help to reduce flood risk for these residents, therefore the effect is localised. There is an opportunity to include responsibilities that will benefit the habitats that may be present in this ditch at the rear of the properties, and care should be taken to reduce negative effects from the maintenance of the ditch.
54	**Improvements to drainage infrastructure**: Southend Road	Introduction of extra gully connections to the Anglian water system along Southend Road, to reduce pooling at the Bypass Junction at Manorway.	The Homesteads Stanford East & Corringham Town	0	0	0	0	0	0	0	0	+	0	0	0	This action increases the resilience to flooding within the borough by removing flood waters from affected areas quickly, therefore having a positive effect on SEA objective 9. Adding more gullies within the borough has the potential to have a negative effect on SEA objective 7, as it could change increase erosion. This could lead to a negative effect on habitats within the borough, by creating gullies in important habitat connectivity areas. There is also potential for a negative effect on SEA objective 5, as increasing runoff from areas could reduce the quality of water and morphology of the borough's rivers, particularly if it were to lead to more contaminated surface run off from roads entering the river network. There is potential for a negative effect on SEA objective 3, as the construction of gullies could damage the habitat around Southend Road, particularly the deciduous woodland that is present along some of the road. This action will increase resilience of the local area to flooding. There is however an opportunity to create wildlife corridors within the gullies by creating more natural gullies. Due to the balance between potential risks and opportunities, the SEA objectives have been scored neutral.
55	**Source control SuDS**: Southend Road	Undertake drainage survey where Southend Road crosses the Manorway, investigating the potential to provide a detention basin in existing green spaces.	The Homesteads Stanford East & Corringham Town	0	0	0	0	0	0	0	0	+	+	0	0	Creating water storage on open land provides the potential to create new habitat that will benefit the habitat and wildlife connectivity of the borough, while also providing positive effects on reducing flood risk to community and the transport network. However, there is potential for a negative effect on SEA objective 3, as the construction of gullies could damage the habitat around Southend Road, particularly the deciduous woodland that is present to the south of the junction. However, it has been scored neutral as details of the action are currently unknown. This action will increase resilience of the local area to flooding (SEA objective 9). There is also a positive effect on SEA objective 10 from the implementation of SuDS.
56	**Emergency planning**: Southend Road	Ensure an emergency plan and traffic management plan is in place for Southend Road underpass during flood events.	The Homesteads Stanford East & Corringham Town	0	0	0	0	0	0	0	0	+	0	+	0	This action will increase the resilience of the local population and transport network to flooding by creating an emergency plan. There are no effects on the remaining SEA objectives as there is are no direct interventions in the area.
57	**South control SuDS**: A13 / railway	Investigate two flow paths from farmland in the north and northeast of the AoCD to determine the effects of providing storage in the north of the catchment.	Orsett	0	+	+	0	0	0	0	0	+	+	+	0	Creating a storage area on the recreation ground provides the opportunity to improve BAP habitat, habitat connectivity and wildlife corridors within the borough, therefore having a positive effect on SEA objectives 2 and 3. This action is also likely to reduce erosion and pollution within the area. There will be benefits to SEA objectives 9, 10 and 11 by reducing the risk of flooding and potential implementation of SuDS.
58	**Source control SuDS**: Hassen Brook	Feasibility study into the potential creation of a storage area between the A13 and railway line with a flow control limiting surface water flow entering the Hassen Brook from the north of the catchment.	The Homesteads Corringham & Fobbing	0	0	0	0	0	0	0	0	+	+	+	0	
59	**Improvements to drainage infrastructure**: Bramleys and Russet Close	Provision of extra gullies along Bramleys and Russet Close to Anglian Water System. Investigate the impact this would have on flooding in the Dunstable Road area.	The Homesteads	0	0	0	0	0	0	0	0	+	0	0	0	This action increases the resilience to flooding within the borough by removing flood waters from affected areas quickly, therefore having a positive effect on SEA objective 9. Adding more gullies within the borough has the potential to have a negative effect on SEA objective 7, as it could change increase erosion. This could lead to a negative effect on habitats within the borough, by creating gullies in important habitat connectivity areas. There is also potential for a negative effect on SEA objective 5, as increasing runoff from areas could reduce the quality of water and morphology of the borough's rivers, particularly if it were to lead to more contaminated surface run off from roads entering the river network. There is potential for a negative effect on SEA objective 3, as the construction of gullies could damage the habitat around Bramleys and Russet Close, although it is not designated as BAP habitat. This action will increase resilience of the local area to flooding. There is however an opportunity to create wildlife corridors within the gullies by creating more natural gullies. Due to the balance between potential risks and opportunities, the SEA objectives have been scored neutral.
60	**Flood storage**: Balstonia Recreation Gardens	Investigate potential for flood storage in Balstonia Recreation Gardens to reduce the impact of flooding on Bramley.	The Homesteads	0	+	+	+	0	0	0	0	+	+	0	0	Creating a storage area on the recreation gardens provides the opportunity to improve BAP habitats, habitat connectivity, wildlife corridors and increase aquatic habitat within the borough, therefore having a positive effect on SEA objectives 2, 3 and 4. This action is also likely to reduce erosion and pollution within the area. There will be benefits to SEA objectives 9 and 10 by reducing the risk of flooding and potential implementation of SuDS

Action				SEA objective												Comments
ID	What?	How?	Ward	1	2	3	4	5	6	7	8	9	10	11	12	
61	**Improvement to drainage infrastructure**: Wharf Road pumps	Confirm ownership and maintenance of pumps at Wharf Road and Stanford-le-Hope Industrial Park. Investigate potential to increase size/capacity of pumps, potentially sourcing funding from users of the industrial estate.	Stanford-le-Hope West	0	0	0	0	0	0	0	0	+	0	0	0	This action will increase the resilience of the local business to flooding, by introducing better pumps. However, Wharf Road leads to Thames Estuary and Marshes SPA and Ramsar and Mucking Flats and Marshes SSSI, therefore any actions to increase the capacity of pumps should be assessed for impacts on these designated sites. There is also a range of BAP habitat in the area. The effect has been scored neutral as the exact location of the pumps are unknown, as is the magnitude of the effect.
62	**Improvements to drainage infrastructure**: AoCD012	Investigate 'misconnections' and educate homeowners on responsibilities regarding property drainage.	Bulphan	0	0	0	0	0	0	0	0	+	0	0	0	This action will have a small scale, localised positive effect on SEA objective 9, as it will increase the homeowners' resilience to flooding. There are also no direct FRM actions contained within this action, therefore there are no effects on the remaining SEA objectives.
63	**Improvements to drainage infrastructure**: main river alleviation schemes	Liaise with Environment Agency regarding need and opportunities for flood defence schemes on Main Rivers located across the AoCD.	Bulphan	0	0	0	0	0	0	0	0	0	0	0	0	These actions do not include any direct FRM actions that are able to be assessed, therefore having a neutral score on all of the SEA objectives. However, if direct FRM actions arise from the liaison with the Environment Agency, there could be a range of effects on the natural environment, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS.
64	**Improvement to drainage infrastructure**: Bulphan	Investigate where larger capital projects, such as increasing the size of the local sewer network or providing storage, may be required by looking at Anglian Water drainage network plans and RAG capacity plans.	Bulphan	0	0	0	0	0	0	0	0	0	0	0	0	
65	**Planning Policies**: Ford site	Control development at the Ford site by ensuring developers provide a new separate drainage system. The current surface water system rejoins a combined system which has insufficient capacity.	Ockendon Belhus	0	0	0	0	0	0	0	0	+	+	0	0	This action will provide increased resilience for the area against flooding, therefore having a positive effect on SEA objective 9. The action could also include the introduction of SuDS, which would have a positive effect on SEA objective 10.
66	**Improvements to drainage infrastructure**: Buckles Lane	Thurrock Council to consider adopting highway drainage from Buckles Lane, and reinstate and maintain drainage ditches.	Belhus	0	0	0	0	0	0	0	0	+	0	+	0	This action increases the resilience of the area and the transport network to flooding, therefore having a positive effect on SEA objectives 9 and 11. However, such maintenance actions could have a range of effects on the natural environment, both positive and negative, and the maintenance should be subject to thorough environmental assessment at a project stage to ensure they are sustainable. For example, the precise location and effects of the drainage ditches should be assessed, as the eastern end of Buckles Lane has a deciduous woodland BAP habitat. Biodiversity requirements should be considered to influence management actions, i.e. not clearing ditches if there is potential for biodiversity benefit.
67	**Improvement to drainage capacity:** AoCD015	Investigate drainage capacity due to increased pressure from future development in this area. Where there is limited capacity, development policy should ensure development invests in the surface water drainage network.	Aveley & Uplands	0	0	0	0	0	0	0	0	0	0	0	0	There are no effects from this action on the SEA objectives as it does not include direct FRM activities, although there is opportunity to introduce SuDS into the development policy and therefore into development proposals.
68	**Improvements to drainage infrastructure:** AoCD015	Thurrock Council to undertake asset survey and consider adopting maintenance of ditches that fall into 'no-man's land' to ensure future maintenance responsibilities.	Aveley & Uplands	0	0	0	0	0	0	0	0	0	0	0	0	This action does not have any effects on the SEA objectives as it does not include direct FRM activities, however, consideration should be given to the types of maintenance to encourage enhancing of any habitat features that may be present in the ditches.

Table 5-5: Summary of impacts of LFRMS actions on SEA objectives

Receptor	SEA Objective		Summary of impacts	Mitigation requirement
Landscape	**1**	Protect the integrity of the Borough's urban and rural landscapes, and promote the key characteristics of the SLAs and Green Belt.	The majority of LFRMS actions are focused upon undertaking investigations into local flood risk issues and developing appropriate solutions. Given the local scale of the investigations and lack of information at this stage regarding the type or scale of FRM interventions that might take place, these actions have been scored as neutral for most of the SEA objectives, and in particular those associated with the natural environment. However, these actions could have a range of environmental effects, both positive and negative, depending upon the activities they deliver, and they should be subject to thorough environmental assessment at a project stage to ensure they are sustainable and are delivered in accordance with the wider objectives of the LFRMS. It is particularly important that any potential effects are considered cumulatively across the programme of LFRMS actions as the strategy proposes a large number of actions which together could combine to cause significant effects, particularly if a series of actions affect an individual or connected group of environmental features.	There is a general lack of information at this stage to identify the types of effects that are likely to occur. Therefore it is not possible to make a judgement as to the timescale over which they might occur or their likely probability or permanence. It is reasonable to assume that any environmental effects might occur over a range of timescales and will comprise both temporary and permanent effects. It is important that individual actions are assessed at the project stage to determine their potential environmental impacts and that due regard is made to the LFRMS objectives that seek to protect and enhance the environment.
Biodiversity, flora and fauna	**2**	Protect and enhance designated and BAP habitats and species in the borough.		
	3	Maintain and enhance habitat connectivity and wildlife corridors within the borough.		
	4	Maintain existing, and where possible create new, riverine and estuarine habitat to benefit migratory and aquatic species and fisheries, and maintain upstream access.		
Water environment	**5**	Improve the quality and quantity of the water and morphology in the borough's rivers.		
	6	Do not inhibit achievement of the WFD objectives and contribute to their achievement where possible.		
Soils and geology	**7**	Reduce the risk of soil erosion and pollution.		
Archaeology and Cultural Heritage	**8**	Conserve and enhance the historic environment, heritage assets and their settings		
Population	**9**	Increasing the resilience of people, property and businesses and critical infrastructure within Thurrock to the risk of flooding.	The LFRMS actions seek to further the understanding of and improve local flood risk and provide a mechanism through which appropriate solutions can be developed. These actions are primarily focused on delivering benefits to people and property and each has the potential to contribute positively to these SEA objectives. At this stage there is a general lack of information regarding how these actions may be delivered and what effects they might have, and therefore it is difficult to determine the scale or significance of any environmental benefits that might be achieved. Further assessment is required for each action as it is delivered so that the environmental effects, both positive and negative, in relation to the receptors encompassed by these SEA objectives, can be identified.	
	10	Increase the use of SuDS, particularly in all new developments.		
Material assets	**11**	Minimise the impacts of flooding to the borough's transport network and key critical infrastructure.		
Climate	**12**	Reduce vulnerability to climate change impacts and promote measures to enable adaptation to climate change impacts.		

6 Conclusion and recommendations

6.1 Conclusions

The LFRMS aims to promote objectives and actions that seek to enable a more detailed understanding of flood risk within the borough, whilst providing a mechanism through which appropriate FRM activities can be delivered. It is an important tool to protect vulnerable communities and help deliver sustainable regeneration and growth.

This SEA has been undertaken to identify the likely significant environmental effects of implementation of the LFRMS. A proportionate approach was adopted towards establishing the scope of the SEA, reflecting the high-level nature of the LFRMS.

A range of different strategy options for delivering the LFRMS have been assessed at a strategic level against the SEA objectives. These alternatives include the 'do nothing' scenario, where no action is taken and existing assets and ordinary watercourses are abandoned, and the 'maintain current flood risk' scenario, where existing assets and watercourses are maintained as present in line with current levels of flood risk.

The assessment indicates that the 'do nothing' approach is likely to result in a number of significant adverse effects, particularly due to increased flood risk to people and property, and effects on other environmental assets including water quality, historic assets and biodiversity, where increased flooding may create new pathways for the spread of invasive non-native species. These impacts would be likely to increase over time as responsible bodies will be unable to incorporate precautionary measures in existing or new developments in a response to climate change pressures. Conversely, increased flood risk may result in greater connectivity between watercourses and their floodplains, offering opportunities for habitat creation/enhancement of benefit to a range of protected and notable species.

The option to 'maintain current flood risk' is likely to result in little or no additional impact on the environment in the short to medium term as the existing FRM regime continues to maintain existing levels of flood protection. However, in the future, as a result of climate change, flood risk will increase, resulting in many of the impacts identified under the 'do nothing' scenario, although potentially to a lesser extent and significance.

Therefore, the SEA identifies that implementation of the LFRMS to 'understand and manage flood risk from localised sources' is the only realistic approach to be employed by the Thurrock Council as it has the potential to provide a range of environmental benefits and offers a pro-active approach to managing flood risk.

6.1.1 LFRMS objectives

Assessment of the LFRMS objectives against the SEA objectives has been undertaken (see Table 5-2). No negative environmental effects have been identified from the LFRMS objectives. Many of the proposed LFRMS objectives have the potential for both direct and indirect environmental benefits. LFRMS objective 7 in particular has potential to provide a positive contribution to all of the SEA objectives and make a significant positive contribution to many of them, as it seeks to encourage design and development that not only reduces flood risk but also seeks to improve environmental quality. In particular, there is opportunity through the LFRMS to achieve a range of biodiversity benefits, including new habitat creation, enhancement of existing habitats and greater habitat connectivity.

In addition, as expected of a strategy for managing flood risk, the majority of objectives within the strategy will contribute to achievement of the SEA objectives that seek to reduce flood risk to people, property and infrastructure. As a result, the LFRMS is likely to have a significant positive effect on reducing flood risk to local communities.

Some of the LFRMS objectives, in particular 1, 3 and 7, are also likely to assist with climate change adaptation. In particular, measures that reduce flood risk, promote better use of water resources, seek to deliver new habitat creation and better connection between existing habitats (such as de-culverting), could make a significant positive contribution to achievement of SEA objective 12.

At present, the potential effects associated with several of the LFRMS measures are neutral. These are largely neutral as they are data gathering and communication objectives rather than environmental objectives. There is a potential that to achieve these LFRMS objectives it may result in physical interventions that could affect achievement of several of the SEA objectives, depending upon how they are implemented. These risks are directly associated with the type and scale of development or measures to achieve the social objectives, and their location in relation to important or sensitive environmental features. However, given that the LFRMS includes objective 7 which seeks to deliver a range of environmental improvements, such interventions, if delivered in an inappropriate manner, would be likely to conflict with delivery of the LFRMS. Therefore, the LFRMS should ensure integration of its objectives across all underpinning actions so that delivery of individual measures does not conflict with achievement of the wider strategy objectives, but instead seeks to contribute towards these objectives at all stages of the strategy's implementation. Achievement of reducing flood risk can also help to achieve the LFRMS's social objectives as it would alleviate the cost and disruption associated with flooding, while also reducing the stress and anxiety associated with the risk of flooding.

A detailed assessment of the potential cumulative effects of the LFRMS actions should be undertaken when further details regarding specific project level measures and their implementation are known.

6.1.2 LFRMS actions

Assessment of the LFRMS actions against the SEA objectives was undertaken (Table 5-4). Some negative and positive environmental effects have been identified, with the majority having a neutral effect. The two negative effects are both minor, and arise from the actions that require the installation of culverts and some gullies.

Many of the LFRMS actions have a neutral effect as they are reviews and research actions focused on improving understanding of local flood risk rather than implementation of FRM measures. They will generally have fairly local effects, but primarily contribute towards the SEA objectives that aim to reduce flood risk within the borough. Actions to reduce flood risk could have a range of effects on the natural environment, and have the potential for indirect environmental benefits. LFRMS actions that provide water storage in green spaces such as parks, open spaces and road verges have the potential to provide a positive contribution to the SEA objectives concerned with biodiversity through the introduction of new wildlife habitat.

In addition, as expected of a strategy for managing flood risk, the majority of actions within the strategy will contribute to achievement of the SEA objectives that seek to reduce flood risk to people, property and infrastructure. As a result, the LFRMS is likely to have a positive effect on reducing flood risk to local communities. The opportunity to include SuDS is reflected in the actions, especially 11, 12, 13, 15, 16 and 32, where a significant positive effect has been assessed.

The increased understanding of flood risk that many of the LFRMS actions will provide will indirectly contribute towards SEA objective 12 by increasing understanding of the effects of climate change. This increased understanding has the potential to lead to development and implementation of management measures that will reduce vulnerability to climate change.

The physical interventions that could come as a result of the LFRMS actions could affect the achievement of the SEA objectives, depending on how the actual FRM measures are implemented. These risks are directly associated with the type and scale of the FRM and their location in relation to environmental features. Therefore the LFRMS should ensure that delivery of these measures does not adversely affect the achievement of the SEA objectives. These physical interventions should be subject to a thorough environmental assessment at the project stage to ensure they are sustainable and are delivered in accordance with the LFRMS objectives.

6.2 Recommendations

The assessment of the LFRMS objectives and actions has identified a number of areas where the LFRMS could be strengthened to ensure delivery of a sustainable approach. These areas are associated with communication aspects regarding flood risk, and not directly aiming to implement FRM measures. Specifically, these apply to the following LFRMS objectives/measures:

- Objective 2 – *Identify any gaps where further studies are required so we can get a better understanding of the causes and effects of local flooding.*
- Objective 4 – *Establish clear roles, powers and responsibilities for Thurrock RMAs.*

- Objective 5(i) – *Provide improved communication of clear information on local flood risk, appropriate responses and the responsibilities for us and our partners.*
- Objective 5(ii) – *State what we and other RMAs cannot take responsibility for, and facilitate engagement of the public and stakeholders to take action.*
- Objective 6 – *Improve co-operative working between all RMAs, including across administrative boundaries.*
- Objective 8 – *Establish a strategic funding plan and programme so we identify priorities, secure funding for measures that are affordable and that wherever possible include provisions for contributions by those who benefit.*

Although many of these objectives have a positive effect on SEA objectives 9 and 11 to minimise the risk of flooding to the Borough, there are neutral effects on the other SEA objectives. Therefore, while achieving these LFRMS objectives there is an opportunity for the LFRMS to implement FRM measures that also consider the SEA objectives as a whole, and therefore produce a sustainable FRM programme which enhances biodiversity, historic assets and landscape character.

In order to ensure that the LFRMS does not result in adverse effects, all strategy objectives should be integrated so that delivery of individual actions does not conflict with achievement of the wider strategy objectives. In addition, development and implementation of these actions should be effectively managed by ensuring that, where necessary, proposals are assessed to determine their potential environmental effects (positive and negative) in advance of their implementation and that appropriate mitigation measures are built into their delivery as required.

In addition, LFRMS objective 7 (*Improve natural habitat and the social environment through flood management schemes which provide multiple benefits*) has the potential to deliver significant environmental benefits. The LFRMS should seek to maximise the potential environmental benefits associated with delivery of this objectives and actions. This can be best achieved through the integration of LFRMS objectives and through close partnership working, so that appropriate resources and funding are effectively allocated.

Table 6-1 summarises the recommendations made by the SEA and shows how the recommendations have been responded to in the LFRMS.

Table 6-1: How the environmental report has been taken into account in the LFRMS

SEA recommendation	Final decision
LFRMS to be strengthened by considering the SEA objectives as a whole to ensure delivery of a sustainable approach/	The LFRMS has been updated to take account of the SEA objectives to ensure that LFRMS actions will be delivered in a sustainable way.
LFRMS objectives should be integrated so that delivery of individual actions do not conflict with achievement of the wider strategy objectives.	LFRMS actions will be undertaken with consideration of the wider Strategy objectives.
Proposals should be assessed to determine their potential environmental effects (positive and negative) in advance of implementation and appropriate mitigation measures are built into their delivery as required.	As actions identified in the strategy are investigated in more detail, further environmental assessment will be undertaken during the feasibility stages to identify what appropriate mitigation measures may be required for their delivery.
LFRMS should seek to maximise the potential environmental benefits associated with delivery of the objectives and actions.	LFRMS has been updated to include more explicit reference to WFD and the environment and how the Strategy will seek to maximise environmental benefits during deliver of the objectives and actions.

6.3 Monitoring

The SEA Regulations require Thurrock Council to monitor the significant environmental effects (positive and negative) upon the implementation of the LFRMS. Key potential environmental effects that require monitoring are listed in Table 6-2. Several of these monitoring requirements are likely to require a partnership approach to effectively track the effects of the strategy. Possible partners for monitoring responsibility are therefore highlighted.

The monitoring indicators will enable the LFRMS to be monitored and any problems or shortfalls to be highlighted and remedied at an early stage. If failings are evident, it will be necessary for the LFRMS to be revised so that the achievement of the SEA objectives is not compromised. Of note, it is unlikely

that any effects negative or otherwise will be seen immediately and that the relative time scale for monitoring will vary for each indicator/target.

Table 6-2: SEA monitoring framework

LFRMS objective / action	SEA objective(s)	Potential significant effects	Monitoring indicator	Possible monitoring and/or delivery partners
Objective 1 *Reduce the likelihood and consequence of flooding, particularly from surface water, groundwater and ordinary watercourses.*	9, 11 and 12	Introducing FRM measures with the objectives of reducing flood risk, therefore reducing harm to people, economy and society assists with the achievement of all these SEA objectives.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.	Thurrock Council Anglian Water Environment Agency Highways Agency
Objective 3 *Reduce the vulnerability of Thurrock, its residents and visitors to the detrimental effects of flooding.*	9, 11 and 12	Introducing FRM measures with the objectives of reducing flood risk, therefore reducing harm to people, economy and society assists with the achievement of all these SEA objectives.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.	Thurrock Council Anglian Water Environment Agency Highways Agency
Objective 7 *Improve natural habitat and the social environment through flood management schemes which provide multiple benefits.*	2, 3, 4, 5, 6, 9, 11 and 12	Improving FRM systems with the objectives of improving the environment as well as reducing harm to people, economy, environment and society assists with the achievement of all the SEA objectives.	Area of designated sites adversely affected by flooding. Monitoring of reported status of designated nature conservation sites. Percentage of land designated as nature conservation sites as a result of LFRMS measures. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed. Water quality and morphology of the borough's watercourses. Number of pollution incidents. Number of SuDS schemes installed as part of the LFRMS. Number and volume of Environment Agency licensed abstractions. Numbers of sites with high	Thurrock Council Anglian Water Environment Agency Highways Agency

LFRMS objective / action	SEA objective(s)	Potential significant effects	Monitoring indicator	Possible monitoring and/or delivery partners
			pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding. Achievement of WFD objectives. Percentage of water bodies achieving 'Good' ecological status/potential. No deterioration in WFD status. Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding.	
Action 11 **Runoff rates and volumes** for new small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be controlled. *For all new developments:* *The peak runoff rate for the 1 in 1 year and 1 in 200 year runoff must not exceed the peak greenfield runoff rate for the same event.* *The runoff volume for the development site in the 1 in 200 year, 6 hour rainfall event must not exceed the runoff volume for the same event.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff.	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 12 **Runoff from development on previously developed sites** for small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be restricted to greenfield levels. *For previously developed sites the peak runoff rate (1 in 1 and 1 in 100 year) and volumes (1 in 100 year, 6 hour rainfall event) must not exceed the equivalent greenfield rates.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 13 **Green roofs/areas.** *Investigate opportunities to introduce green roofs/areas as and when sites become available for development.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 15 **Drainage improvements**: planning policy. *Use planning policy and advice regarding paving of driveways, using residential soakaways, water butts etc. Develop policy to resist the paving over of driveways.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 16 **Drainage improvements**: preferential flow paths. *Identify programme of potential preferential flow path works e.g. contoured grass verges.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency

LFRMS objective / action	SEA objective(s)	Potential significant effects	Monitoring indicator	Possible monitoring and/or delivery partners
Action 32 **Preferential flow paths**: Hathaway Road. *Investigate the use of swales/French drains to attenuate and infiltrate runoff along Hathaway Road and reduce volumes of water ponding behind the rail embankment.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency

6.4 Habitats Regulations Assessment

A Test of Likely Significant Effect (screening assessment) has been prepared in accordance with the requirements of the Habitats Regulations to determine whether the LFRMS is likely to adversely affect the integrity of a European site (alone or in combination). This is summarised in Section 1.6 and described in Appendix A. The screening assessment concluded that the LFRMS is not likely to have a significant effect on any of the European sites.

Consultation with Natural England on the outcomes of the screening assessment was undertaken as part of the SEA scoping consultation exercise. Natural England confirmed that the LFRMS is not likely to have a significant effect on the European sites.

Following development of the draft strategy objectives and measures, the screening assessment was reviewed to determine whether the LFRMS would be likely to have a significant effect on the European sites. It was agreed with Natural England that the Borough is of sufficient distance from these sites that no likely significant effect and an Appropriate Assessment is not required.

The outcomes of this revised screening assessment are documented in A of this report. The screening assessment concludes that the LFRMS is not likely to have a significant adverse effect on a European site.

Consultation with Natural England on the outcomes of this assessment has been undertaken as part of the consultation process outlined in Section 7.

7 Consultation on draft Environmental Report

The consultation on the draft Environmental Report lasted for a period of six weeks, beginning on 3 August 2015. Responses were received from Environment Agency, Natural England and Historic England. Additionally, Natural England provided comments on the HRA. The responses were mainly supportive of the approach to the SEA and included a variety of comments ranging from specific queries and details to general comments, mainly in relation to biodiversity and flooding. Appendix C shows how the consultation responses have been taken into account in the final plan.

No further comments were received during the preparation of the final Environmental Report.

Due to the relatively local scale and nature of the LFRMS, no trans-boundary consultations were undertaken or comments received under regulation 14 of the SEA Regulations.

All consultation responses received were reviewed and taken into consideration for the next stage of appraisal process. This involved the preparation of a Post Adoption Statement (PAS), which sets out how the findings of the Environmental Report and the views expressed during the consultation period have been taken into account as the LFRMS has been finalised and formally approved. The PAS will also set out any additional monitoring requirements needed to track the significant environmental effects of the strategy.

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A Appendix A: Habitats Regulations Assessment

Test of Likely Significance

A.1 Record of Assessment of Likely Significant Effect on a European/International Site (SAC/SPA/Ramsar)

This assessment identifies and considers the likely adverse effects of the LFRMS, either individually or in combination with other plans or projects, upon a European site and considers whether these impacts are likely to be significant. It comprises a series of tables that identify the European sites of relevance to this assessment (Table A-1); the potential hazards associated with the LFRMS objectives and measures and their relevance to these European sites (Tables A-2 and A-3); and the likelihood that these hazards would cause a significant adverse effect on a European site (Table A-4 and A-5).

Table A-1: Assessment scope

Type or permission/activity	Local Flood Risk Management Strategy (LFRMS)
Project/File Ref. Number	Thurrock Borough
National Grid Reference (NGR)	TQ 585 787
Brief Description of the project	The LFRMS is a requirement under the Flood and Water Management Act (2010). The Act outlines the responsibility of the lead local flood authority to 'develop, maintain, apply and monitor' a strategy for local flood risk management. It notes that the strategy must identify or outline the following: • The risk management authorities in the area; • The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area; • The objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009; • The measures proposed to achieve those objectives; • How and when the measures are expected to be implemented; • The costs and benefits of those measures, and how they are to be paid for; • The assessment of local flood risk for the purpose of the strategy; • How and when the strategy is to be reviewed; and • How the strategy contributes to the achievement of wider environmental objectives.
European Site Name and Status	**North Downs Woodlands SAC**
Distance to European/International Site	9km south
Site EU Reference Number	UK0030225
Site Centre NGR	TQ 674 629
List of Site Interest Features	Designated primarily for the Annex 1 habitats that this site comprises, namely *Asperulo-Fagetum* beech forests (9130) and *Taxus baccata* woods of the British Isles (91J0). Other qualifying habitats within the SAC are semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (6210)
European Site Name and Status	**Peters Pit SAC**
Distance to European/International Site	12km south
Site EU Reference Number	UK0030237
Site Centre NGR	TQ 717 628
List of Site Interest Features	The Annex 2 species Great Crested Newt *Triturus cristatus* (1166) is the primary reason for the selection of the site.

European Site Name and Status	**Essex Estuaries SAC**
Distance to European/International Site	10km NE
Site EU Reference Number	UK0013690
Site Centre NGR	TM 103 048
List of Site Interest Features	**Designated primarily for the following Annex 1 habitats:** 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1310 *Salicornia* and other annuals colonising mud and sand 1320 *Spartina* swards (*Spartinion maritimae*) 1130 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1420 Mediterranean and thermos-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) **Other qualifying feature within the SAC:** 1110 Sandbanks which are slightly covered by sea water all the time
European Site Name and Status	**Thames Estuary and Marshes SPA**
Distance to European/International Site	Within – borders coastline around Stanford-le-Hope and Tilbury
Site EU Reference Number	UK9012021
Site Centre NGR	TQ 718 789
List of Site Interest Features	This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: Over winter: - Avocet *Recurvirostra avosetta*, 276 individuals representing at least 21.7% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6) - Hen Harrier *Circus cyaneus*, 7 individuals representing at least 0.9% of the wintering population in Great Britain (5 year mean 93/4-97/8) This site also qualifies **under Article 4.2 of** the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: On passage: - Ringed Plover *Charadrius hiaticula*, 559 individuals representing at least 1.1% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6) Over winter: - Ringed Plover *Charadrius hiaticula*, 541 individuals representing at least 1.1% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6) The area qualifies **under Article 4.2 of** the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl
European Site Name and Status	**Thames Estuary and Marshes Ramsar**
Distance to European/International Site	Within – borders coastline around Stanford-le-Hope and Tilbury
Site EU Reference Number	UK9012021
Site Centre NGR	TQ 718 789
List of Site Interest Features	**Ramsar criterion 2 -** The site supports one endangered plant species and at least 14 nationally scarce plants of wetland habitats. The site also supports more than 20 British Red Data Book invertebrates **Ramsar criterion 5 -** Assemblages of international importance: 45118 waterfowl (5 year peak mean 1998/99-2002/2003) **Ramsar criterion 6 –** Species/populations occurring at levels of international importance: Ringed Plover *Charadrius hiaticula*, Europe/NW Africa

	(595 individuals, representing an average of 1.8% of the GB population) - Black-tailed godwit *Limosa limosa islandica*, Iceland/W Europe (1640 individuals, representing an average of 4.6% of the population) - Grey plover *Pluvialis squatarola*, E Atlantic/W Africa (1643 individuals, representing an average of 3.1% of the GB population) - Red knot *Calidris canutus islandica*, W & Southern Africa (7279 individuals, representing an average of 1.6% of the population) - Dunlin *Calidris alpina alpine*, W Siberia/W Europe (15171 individuals, representing an average of 1.1% of the population) - Common redshank *Tringa totanus tetanus* (1178 individuals, representing an average of 1% of the GB population) Noteworthy flora: - *Lactuca saligna* - *Alopecurus bulbosus* - *Bupleurum tenuissimum* - *Carex divisa* - *Chenopodium chenopodiodes* - *Hordeum marinum* - *Inula crithmoides* - *Polypogon monspeliensis* - *Puccinellia fasciculate* - *P. rupestris* - *Salicornia pusilla* - *Trifolium glomeratum* - *T.squamosum* - *Zoastera angustifolia* - *Z. noltei* Noteworthy fauna: Birds – - Little grebe *Tachybaptus ruficollis ruficollis* - Little egret *Egretta garzetta* - Ruff *Philomachus pugnax* - Common greenshank *Tringa nebularia* - Common shelduck *Tadorna tadorna* - Gadwall *Anas strepera strepera* - Northern shoveler *Anas clypeata* - Water rail *Rallus aquaticus* - Pied avocet *Recurvirostra avosetta* - Spotted redshank *Tringa erythropus* Invertebrates – - *Bagous longitarsis* - *Henestaris halophilus* - *Bagous cylindrus* - *Polystichus connexus* - *Erioptera bivittata* - *Limnophila pictipennis* - *Hybomitra expollicata* - *Lejops vittata* - *Poecilobothrus ducalis* - *Pteromicra leucopeza* - *Philanthus Triangulum* - *Lestes dryas* - *Anisodactylus poeciloides* - *Aulacochthebius exaratus* - *Berosus fulvus* - *Cercyon bifenestratus* - *Hydrochus elongates* - *H. ignicollis* - *Ochthebius exaratus* - *Hydrophilus piceus* - *Malachius vulneratus* - *Philonthus punctus* - *Telmatophilus brevicollis* - *Campsicnemus magius* - *Haematopota bigoti* - *Stratiomys longicornis* - *Baccha duffeyi*

European Site Name and Status	**Benfleet and Southend Marshes SPA**
Distance to European/International Site	3.6km east
Site EU Reference Number	UK9009171
Site Centre NGR	TQ 832 861
List of Site Interest Features	This site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: On passage: - Ringed Plover Charadrius hiaticula, 800 individuals representing at least 1.6% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6) Over winter: - Dark-bellied Brent Goose Branta bernicla bernicla, 3,819 individuals representing at least 1.3% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6) - Grey Plover Pluvialis squatarola, 3,789 individuals representing at least 2.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6) - Knot Calidris canutus, 8,850 individuals representing at least 2.5% of the wintering Northeastern Canada/Greenland/Iceland/Northwestern Europe population (5 year peak mean 1991/2 - 1995/6) The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl
European Site Name and Status	**Benfleet and Southend Marshes Ramsar**
Distance to European/International Site	3.6km east
Site EU Reference Number	UK9009171
Site Centre NGR	TQ 832 861
List of Site Interest Features	**Ramsar criterion 5 –** Assemblages of international importance: 32867 waterfowl (5 year peak mean 1998/99-2002/2003) **Ramsar criterion 6 –** Species/populations occurring at levels of international importance: - Dark-bellied brent goose *Branta bernicla bernicla* (4532 individuals, representing an average of 2.1% of the population) - Grey plover *Pluvialis squatarola*, E Atlantic/W Atlantic (1710 individuals, representing an average of 3.2% of the GB population) - Red knot *Calidris canutus islandica*, W & Southern Africa (6307 individuals, representing an average of 1.4% of the population) Species/populations identified subsequent to designation for possible future consideration under criterion 6: - Dunlin *Calidris alpina alpine*, W Siberia/W Europe (17591 individuals, representing an average of 1.3% of the population) Noteworthy flora: - *Hordeum marinum* - *Bupleurum tenuissimum* - *Trifolium squamosum* - *Chenopodium chenopodioides* - *Limonium humile* - *Inula crithmoides* - *Spartina maritima* - *Zostera marina* - *Zostera noltei*

	Noteworthy fauna: Birds – - Little egret *Egretta garzetta* - Common greenshank *Tringa nebularia* - Ringed plover *Charadrius hiaticula* Amphibians – - *Triturus cristatus* Invertebrates – - *Myopites bloti* - *Lestes dryas*
European Site Name and Status	**Medway Estuary and Marshes SPA**
Distance to European/International Site	8.6km south east
Site EU Reference Number	UK9012031
Site Centre NGR	TQ 850 726
List of Site Interest Features	This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: During the breeding season: - Avocet *Recurvirostra avosetta*, 28 pairs representing at least 4.7% of the breeding population in Great Britain (5 year mean, 1988-1992) - Little Tern *Sterna albifrons*, 28 pairs representing at least 1.2% of the breeding population in Great Britain (5 year mean, 1991-1995) Over winter: - Avocet *Recurvirostra avosetta*, 314 individuals representing at least 24.7% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6) This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: On passage: - Ringed Plover *Charadrius hiaticula*, 1,337 individuals representing at least 2.7% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6) Over winter: - Black-tailed Godwit *Limosa limosa islandica*, 957 individuals representing at least 1.4% of the wintering Iceland - breeding population (5 year peak mean 1991/2 - 1995/6) - Dark-bellied Brent Goose *Branta bernicla bernicla*, 3,205 individuals representing at least 1.1% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6) - Dunlin *Calidris alpina alpina*, 25,936 individuals representing at least 1.9% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6) - Grey Plover Pluvialis squatarola, 3,406 individuals representing at least 2.3% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6) - Pintail *Anas acuta*, 697 individuals representing at least 1.2% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6) - Redshank *Tringa totanus*, 3,690 individuals representing at least 2.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6) - Ringed Plover *Charadrius hiaticula*, 768 individuals

	representing at least 1.5% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6) - Shelduck *Tadorna tadorna*, 4,465 individuals representing at least 1.5% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6) The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl
European Site Name and Status	**Medway Estuary and Marshes Ramsar**
Distance to European/International Site	8.6km south east
Site EU Reference Number	UK9012031
Site Centre NGR	TQ 850 726
List of Site Interest Features	**Ramsar criterion 2 –** The site supports a number of species of rare plants and animals. The site holds several nationally scarce plants, including sea barley *Hordeum marinum*, curved hard-grass *Parapholis incurva*, annual beard-grass *Polypogon monspeliensis*, Borrer's saltmarsh-grass *Puccinellia fasciculata*, slender hare`s-ear *Bupleurum tenuissimum*, sea clover *Trifolium squamosum*, saltmarsh goose-foot *Chenopodium chenopodioides*, golden samphire *Inula crithmoides*, perennial glasswort *Sarcocornia perennis* and one-flowered glasswort *Salicornia pusilla*. A total of at least twelve British Red Data Book species of wetland invertebrates have been recorded on the site. These include a ground beetle *Polistichus connexus*, a fly *Cephalops perspicuus*, a dancefly *Poecilobothrus ducalis*, a fly *Anagnota collini*, a weevil *Baris scolopacea*, a water beetle *Berosus spinosus*, a beetle *Malachius vulneratus*, a rove beetle *Philonthus punctus*, the ground lackey moth *Malacosoma castrensis*, a horsefly Atylotus latistriatuus, a fly *Campsicnemus magius,* a solider beetle, *Cantharis fusca*, and a cranefly *Limonia danica*. A significant number of non-wetland British Red Data Book species also occur. **Ramsar criterion 5 –** Assemblages of international importance: 47637 waterfowl (5 year peak mean 1998/99-2002/2003) **Ramsar criterion 6 –** Species/populations occurring at levels of international importance: - Grey plover *Pluvialis squatarola*, E Atlantic/W Africa (3103 individuals, representing an average of 1.2% of the population) - Common redshank *Tringa totanus tetanus* (3709 individuals, representing an average of 1.4% of the population) - Dark-bellied brent goose *Branta bernicla bernicla* (2575 individuals, representing an average of 1.1% of the population) - Common shelduck *Tadorna tadorna*, NW Europe (2627 individuals, representing an average of 3.3% of the GB population) - Northern pintail *Anas acuta*, NW Europe (1118 individuals, representing an average of 1.8% of the population) - Ringed plover *Charadrius hiaticula*, Europe/Northwest Africa (540 individuals, representing an average of 1.6% of the GB population) - Red knot *Calidris canutus islandica*, W & Southern Africa (3021 individuals, representing an average of 1% of the GB population) - Dunlin *Calidris alpina alpina*, W Siberia/W Europe (8263 individuals, representing an average of 1.4% of the GB population) Species/populations identified subsequent to designation for possible future consideration under criterion 6: - Black-tailed godwit *Limosa limosa islandica*, Iceland/W Europe (721 individuals, representing an average of 2% of the population)

	Noteworthy flora: - *Hordeum marinum* - *Parapholis incurva* - *Polypogon monspeliensis* - *Puccinellia fasciculate* - *Bupleurum tenuissimum* - *Trifolium squamosum* - *Chenopodium chenopodioides* - *Inula crithmoides* - *Sarcocornia perennis* - *Salicornia pusilla* Noteworthy fauna: Birds – - Mediterranean gull *Larus melanocephalus* - Black-headed gull *Larus ridibundus* - Sandwich tern *Sterna (Thalasseus) sandvicensis sandvicensis* - Common tern Sterna hirundo hirundo - Little tern *Sterna albifrons albifrons* - Great cormorant *Phalacrocorax carbo carbo* - Little egret *Egretta garzetta* - Pied avocet *Recurvirostra avosetta* - Whimbrel *Numenius phaeopus* - Eurasian curlew *Numenius arquata arquata* - Common greenshank *Tringa nebularia* - Ruddy turnstone *Arenaria interpres interpres* - Northern shoveler *Anas clypeata* - Eurasian oystercatcher *Haematopus ostralegus* ostralegus - European golden plover *Pluvialis apricaria apricaria* Invertebrates – - *Polystichus connexus* - *Cephalops perspicuous* - *Peocilobothrus ducalis* - *Anagnota collini* - *Baris scolopacea* - *Berosus spinosus* - *Malachius vulneratus* - *Philonthus punctus,* - *Malacostoma castrensis* - *Atylotus latistriatus* - *Campsicnemus magius* - *Cantharis fusca* - *Limonia Danica* - *Lestes dryas* - *Hydrochus ignicollis* - *Hydrophilus piceus* - *Dicranomyia Danica* - *Lejops vittata*
European Site Name and Status	**Crouch and Roach Estuaries SPA**
Distance to European/International Site	10km north east
Site EU Reference Number	UK9009244
Site Centre NGR	TQ 834 960
List of Site Interest Features	This site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: Over winter: - Dark-bellied Brent Goose *Branta bernicla bernicla*, 3,074 individuals representing at least 1.0% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)
European Site Name and Status	**Crouch and Roach Estuaries Ramsar**
Distance to European/International Site	10km north east
Site EU Reference Number	UK9009244
Site Centre NGR	TQ 834 960
List of Site Interest Features	**Ramsar criterion 2 –** Supports an appreciable assemblage of rare, vulnerable or

	endangered species or subspecies of plant and animal including 13 nationally scarce plant species: slender hare's ear *Bupleurum tenuissimum*, divided sedge *Carex divisa*, sea barley *Hordeum marinum*, golden-samphire *Inula crithmoides*, laxflowered sea-lavender *Limonium humile*, curved hard-grass *Parapholis incurva*, Borrer's saltmarsh grass *Puccinellia fasciculata,* stiff saltmarsh grass *Puccinellia rupestris*, spiral tasselweed *Ruppia cirrhosa*, one-flowered glasswort *Salicornia pusilla*, small cord-grass *Spartina maritima*, shrubby seablite *Suaeda vera* and sea clover *Trifolium squamosum*. Several important invertebrate species are also present on the site, including scarce emerald damselfly *Lestes dryas*, the shorefly *Parydroptera discomyzina*, the rare soldier fly *Stratiomys singularior*, the large horsefly *Hybomitra expollicata*, the beetles *Graptodytes bilineatus* and *Malachius vulneratus*, the ground lackey moth *Malacosoma castrensis* and *Eucosoma catoprana*. **Ramsar criterion 5 –** Assemblages of international importance: 16970 waterfowl (5 year peak mean 1998/99-2002/2003) **Ramsar criterion 6 –** Species/populations occurring at levels of international importance: - Dark-bellied brent goose *Branta bernicla bernicla* (2103 individuals, representing an average of 2.1% of the GB population) Noteworthy flora: - *Bupleurum tenuissimum* - *Carex divisa* - *Hordeum marinum* - *Inula crithmoides* - *Limonium humile* - *Parapholis incurve* - *Puccinellia fasciculata* - *Puccinellia rupestris* - *Ruppia cirrhosa* - *Salicornia pusilla* - *Spartina maritima* - *Suaeda vera* - *Trifolium squamosum* Noteworthy fauna: Birds – - Little egret *Egretta garzetta* - Ruff *Philomachus pugnax* - Whimbrel *Numenius phaeopus* - Spotted redshank *Tringa erythropus* - Common greenshank *Tringa nebularia* - Hen harrier *Circus cyaneus* - Black-tailed godwit *Limosa limosa islandica* Invertebrates – - *Graptodytes bilineatus* - *Hybomitra expollicata* - *Lestes dryas* - *Malachius vulneratus* - *Malacosoma castrensis* - *Parydroptera discomyzina* - *Stratiomys longicornis* - *Eucosma catoptrana*
Is this proposal directly connected with or necessary to the management of the sites for nature conservation?	No

Table A-2: Potential hazards and effects to European sites associated with the LFRMS

Hazards and Effects in reference to the individual elements and consented activities of the project. Describe any hazards or effects with potential to give rise to impacts on the European Site (either alone or in combination with other plans or projects).		
Sensitive Interest Features	**Potential Hazard(s)**	**Potential Exposure to hazard and mechanism of effect/impact if known**
Forests North Downs Woodlands SAC Peters Pit SAC	None	The SAC sites are located a significant distance (9km; 12km, respectively) from the boundary of Thurrock. The sites are not hydrologically linked with the borough. The LFRMS seeks to implement flood risk management measures in the district and does not aim to influence flood risk or flood risk management activities at a wider regional level. Flood risk management activities introduced by the LFRMS will therefore have a local impact and will not extend a significant distance beyond the boundary of the Borough. No hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. **Therefore, no likely significant effects are predicted.**
Dry grassland and scrub North Downs Woodlands SAC Peters Pit SAC	None	The SAC sites are located a significant distance (9km; 12km, respectively) from the boundary of Thurrock. The sites are not hydrologically linked with the borough. The LFRMS seeks to implement flood risk management measures in the district and does not aim to influence flood risk or flood risk management activities at a wider regional level. Flood risk management activities introduced by the LFRMS will therefore have a local impact and will not extend a significant distance beyond the boundary of the Borough. No hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. **Therefore, no likely significant effects are predicted.**
Bogs, fens and wet habitats Peters Pit SAC	None	The SAC site is located a significant distance (12km) from the boundary of Thurrock. The site is not hydrologically linked with the borough. The LFRMS seeks to implement flood risk management measures in the district and does not aim to influence flood risk or flood risk management activities at a wider regional level. Flood risk management activities introduced by the LFRMS will therefore have a local impact and will not extend a significant distance beyond the boundary of the Borough. No hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. **Therefore, no likely significant effects are predicted.**
Vertebrate species: amphibians Peters Pit SAC Benfleet and Southend Marshes Ramsar	None	The SAC site is located a significant distance (12km) from the boundary of Thurrock. The site is not hydrologically linked with the borough. The LFRMS seeks to implement flood risk management measures in the district and does not aim to influence flood risk or flood risk management activities at a wider regional level. Flood risk management activities introduced by the LFRMS will therefore have a local impact and will not extend a significant distance beyond the boundary of the Borough. No hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. **Therefore, no likely significant effects are predicted.**
Estuarine and intertidal habitats Essex Estuaries SAC Thames Estuary and	Changes in water levels or table Changes in water chemistry	Essex Estuaries SAC, Benfleet and Southend Marshes SPA & Ramsar, Medway Estuary and Marshes SPA & Ramsar and Crouch and Roach Estuaries SPA & Ramsar sites are located a significant distance (10km; 3.6km; 8.6km; 10km,

Marshes SPA & Ramsar Benfleet and Southend Marshes SPA & Ramsar Medway Estuary and Marshes SPA & Ramsar Crouch and Roach Estuaries SPA & Ramsar	Surface water flooding changes Toxic contamination	respectively) from the boundary of Thurrock. The LFRMS seeks to implement flood risk management measures in the district and does not aim to influence flood risk or flood risk management activities at a wider regional level. Flood risk management activities introduced by the LFRMS will therefore have a local impact and will not extend a significant distance beyond the boundary of the Borough. **Therefore, no likely significant effects on Essex Estuaries SAC, Benfleet and Southend Marshes SPA & Ramsar, Medway Estuary and Marshes SPA & Ramsar and Crouch and Roach Estuaries SPA & Ramsar sites are predicted.** Thames Estuary and Marshes SPA and Ramsar site are located within Thurrock Borough and lie within the Thames Estuary. Potential effects linked to the hazards identified associated with the LFRMS comprise the following: • Changes to surface and groundwater flow in the Borough, which could impact water availability in the SPA and Ramsar site. • Physical modifications to watercourses in the Borough or changes in surface runoff from land that could affect water quality in the SPA and Ramsar site. Depending on the exact location and nature of such schemes there is the potential for indirect impacts on the sites including physical damage or habitat loss. Assessment of each LFRMS objective and its underpinning actions has been undertaken to identify any potential likely significant effects on the Thames Estuary and Marshes SPA and Ramsar sites.
Birds of estuarine habitat Thames Estuary and Marshes SPA & Ramsar Benfleet and Southend Marshes SPA & Ramsar Medway Estuary and Marshes SPA & Ramsar Crouch and Roach Estuaries SPA & Ramsar	Changes in water levels or table Changes in water chemistry Surface water flooding changes Toxic contamination	Benfleet and Southend Marshes SPA & Ramsar, Medway Estuary and Marshes SPA & Ramsar and Crouch and Roach Estuaries SPA & Ramsar sites are located a significant distance (3.6km; 8.6km; 10km, respectively) from the boundary of Thurrock. The LFRMS seeks to implement flood risk management measures in the district and does not aim to influence flood risk or flood risk management activities at a wider regional level. Flood risk management activities introduced by the LFRMS will therefore have a local impact and will not extend a significant distance beyond the boundary of the Borough. **Therefore, no likely significant effects on Essex Estuaries SAC, Benfleet and Southend Marshes SPA & Ramsar, Medway Estuary and Marshes SPA & Ramsar and Crouch and Roach Estuaries SPA & Ramsar sites are predicted.** Thames Estuary and Marshes SPA and Ramsar site are located within Thurrock Borough and lie within the Thames Estuary. Potential effects linked to the hazards identified associated with the LFRMS comprise the following: • Changes to surface and groundwater flow in the Borough, which could impact water availability in the SPA and Ramsar site. • Physical modifications to watercourses in the Borough or changes in surface runoff from land that could affect water quality in the SPA and Ramsar site. Depending on the exact location and nature of such schemes there is the potential for indirect impacts on the sites including physical damage or habitat loss. Assessment of each LFRMS objective and its underpinning actions has been undertaken to identify any potential likely significant effects on the Thames Estuary and Marshes SPA and Ramsar sites.

Table A-3: Potential hazards to the Thames Estuary SPA and Ramsar site associated with the LFRMS objectives and actions (Key: X = no potential hazard; ✓ = potential hazard)

LFRMS Action	LFRMS Objective	Potential hazards			
		Changes in water levels or table	Changes in water chemistry	Surface water flooding changes	Toxic contamination
Borough wide actions					
Raise awareness of AoCD amongst Planners and influence planning policies to prevent the creation of new risk areas	1,5	X	X	X	X
Community awareness	3, 5	X	X	X	X
Implement a standardised Asset Register	1-6, 8	X	X	X	X
Improved maintenance of drainage network	1, 3	✓	✓	✓	X
Ensure drainage systems are operating at capacity in AoCD	1, 3	X	X	X	X
Implement a standardised flood incident log	2, 5, 6	X	X	X	X
Investigate flooding records and if necessary provide improvements to highways drainage	1-3, 5, 6	✓	✓	✓	X
Runoff rates and volumes for new small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be controlled	1, 3	X	X	X	X
Runoff from development on previously developed sites for small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be restricted to greenfield levels	1, 3	X	X	X	X
Green roofs/areas	1-3	X	X	X	X
Drainage infrastructure improvement: rural roads	1-3, 6	X	X	X	X
Drainage improvements: planning policy	1-3, 6	X	X	X	X
Drainage improvements: preferential flow paths	1, 3	✓	✓	✓	X
Determine whether current emergency response to borough-wide surface water flooding is appropriate	1-3, 6	X	X	X	X
Determine whether services (e.g. power, telecommunications) are resilient to surface water flooding.	3, 5, 6	X	X	X	X
Look for opportunities to reduce flood risk to critical infrastructure whilst upgrading the existing drainage infrastructure.	1, 3, 5, 6	✓	✓	✓	X
Developers to demonstrate compliance with National Planning Policy	1, 3	X	X	X	X

LFRMS Action	LFRMS Objective	Potential hazards			
		Changes in water levels or table	Changes in water chemistry	Surface water flooding changes	Toxic contamination
Areas of Critical Drainage (AoCD) Specific Actions					
A13 drainage capacity	1,3, 6	X	X	X	X
A13 emergency diversion procedures	3, 6	X	X	X	X
Improvements to drainage infrastructure: Purfleet Industrial Park / Milehams Yard	1-3, 6, 8	X	X	X	X
Ensure any development at the Ponds Farm Development provides a betterment on the existing drainage system.	1, 3, 6	X	X	X	X
Emergency plan for AoCD003	3, 6	X	X	X	X
Drainage investigation at the A126 junction.	1-3, 6	X	X	X	X
Ensure any development at Hadley Avenue provides a betterment on the existing drainage system	1, 3, 6	X	X	X	X
Drainage maintenance and investigation: AoCD004	1, 3, 6	X	X	X	X
Preferential flow paths: Hathaway Road	1-3	X	X	X	X
Storage Area: Grays Park	1-3	X	X	X	X
Capital scheme: storage area on recreation ground near to Stifford Primary School	1-3	X	X	X	X
Preferential maintenance regime: AoCD006 (west)	1-3	X	X	X	X
Drainage maintenance and improvement: Florence Close	1-3, 6	X	X	X	X
Storage Area: Hollowfield Avenue	1-3, 6	X	X	X	X
Improvements to drainage infrastructure: Hollowfield Avenue	1-3, 6	X	X	X	X
Preferential flow paths: Balfour Road / Whitehall Road	1, 3	X	X	X	X
Drainage infrastructure improvement: AoCD008	1-3, 6	X	X	X	X
Confirm and map ownership and maintenance and identify 'mis-connections' to the highway drainage	1, 2, 6	X	X	X	X
Improvements to drainage infrastructure: AoCD009	1-3, 5	X	X	X	X
Network rail culverts: AoCD009	1-3, 6	X	X	X	X
Anglian Water adoption of foul and surface water sewer network in this AoCD	1-3, 6	X	X	X	X
Asset survey of surface water ditch: AoCD010	1-3	X	X	X	X
Source control SuDS: north A13	1-3	X	X	X	X
Surface water network capacity improvements: AoCD011b	1, 5	X	X	X	X
Asset survey and maintenance responsibilities: Prospect and Valmar Avenues	1, 3, 5	X	X	X	X

Improvements to drainage infrastructure: Runnymeade Road recreation ground	1-3, 8	X	X	X	X
Source control SuDS: Butts Lane	1-3, 5	X	X	X	X
Asset register: open land in Stanford-le-Hope	1, 3	X	X	X	X
Improvements to drainage maintenance: Victoria Road Brook	1, 3, 5	✓	✓	✓	✓
Improvements to drainage infrastructure: Southend Road	1-3, 6	X	X	X	X
Source control SuDS: Southend Road	1-3	X	X	X	X
Emergency planning: Southend Road	3, 6	X	X	X	X
South control SuDS: A13 / railway	1-3, 8	X	X	X	X
Source control SuDS: Hassen Brook	1-3, 7, 8	X	X	X	X
Improvements to drainage infrastructure: Bramleys and Russet Close	1-3, 6	✓	✓	✓	✓
Flood storage: Balsonia Recreation Gardens	1-3, 7	X	X	X	X
Improvement to drainage infrastructure: Wharf Road pumps	1-3, 6, 7	X	X	X	X
Improvements to drainage infrastructure: AoCD012	2, 5	X	X	X	X
Improvements to drainage infrastructure: main river alleviation schemes	1, 2, 6	X	X	X	X
Improvement to drainage infrastructure: Bulphan	2, 6, 8	X	X	X	X
Planning Policies: Ford site	1, 3, 5	X	X	X	X
Improvements to drainage infrastructure: Buckles Lane	1, 3	X	X	X	X
Improvement to drainage capacity: AoCD015	2, 5	X	X	X	X
Improvements to drainage infrastructure: AoCD015	1, 2	X	X	X	X

Table A-4: Assessment of likely significant effects on the Thames Estuary SPA and Ramsar site associated with relevant LFRMS actions

Relevant LFRMS actions	Potential hazards	Potential for likely significant effect
Borough wide actions		
Improved maintenance of drainage network	• Changes in water levels or table • Changes in water chemistry • Surface water flooding changes • Toxic contamination	This action aims to decrease the regularity of flooding and reduce the risks associated with flooding to highways and properties. The risk and extent to which potential adverse effects are likely to occur is directly linked to the implementation of this action; in particular, the scale and location of any proposed works or changes in water management practices. Present investigations into potential drainage infrastructure and maintenance works are located over 5km from the Thames Estuary SPA and Ramsar site. Investigations are also planned to be conducted on Bramleys Close, Russet Close and Victoria Road, which are located approximately 2km from the site boundary. The planned works are relatively small-scale and local in impact. Therefore, it is unlikely that hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. On implementation, these schemes are likely to be subject to further authorisations, either through the planning process and/or another consenting process. Before any physical works or water management actions are implemented, they will be subject to the requirements of the Habitats Regulations as a matter of law and government policy. An Appropriate Assessment would be required where such works/actions are likely to have a significant adverse effect on the integrity of a European site. Therefore, it can be reasonably concluded at this stage that implementation of this measure is not likely to have a significant adverse effect on the SPA or Ramsar site. **Conclusion: No likely significant effect on the Thames Estuary SPA and Ramsar site.**
Investigate flooding records and if necessary provide improvements to highways drainage	• Changes in water levels or table • Changes in water chemistry • Surface water flooding changes • Toxic contamination	This action aims to reduce the flood risk to highways through documented site visits following flood events and data sharing with partners. This action is an investigation into physical interventions, construction works or changes in water management, and so at present is not likely to have a significant adverse effect on the interest features of the SPA or Ramsar site However, on implementation, these schemes are likely to be subject to further authorisations, either through the planning process and/or another consenting process. Before any physical works or water management actions are implemented, they will be subject to the requirements of the Habitats Regulations as a matter of law and government policy. An Appropriate Assessment would be required where such works/actions are likely to have a significant adverse effect on the integrity of a European site. Therefore, it can be reasonably concluded at this stage that implementation of this measure is not likely to have a significant adverse effect on the SPA or Ramsar site. **Conclusion: No likely significant effect on the Thames Estuary SPA and Ramsar site.**
Drainage improvements: preferential flow paths	• Changes in water levels or table • Changes in water chemistry • Surface water flooding changes • Toxic contamination	This action aims to identify programme of potential preferential flow path works e.g. contoured grass verges. This action is an investigation into physical interventions, construction works or changes in water management, and so at present is not likely to have a significant adverse effect on the interest features of the SPA or Ramsar site. However, on implementation, these schemes are likely to be subject to further authorisations, either through the planning process and/or another consenting process. Before any physical works or water management actions are implemented, they will be subject to the requirements of the Habitats Regulations as a matter of law and government policy. An Appropriate Assessment would be required where such works/actions are likely to have a significant adverse effect on the integrity of a European site. Therefore, it can be reasonably concluded at this stage that implementation of this measure is not likely to have a significant adverse effect on the SPA or Ramsar site. **Conclusion: No likely significant effect on the Thames Estuary SPA and Ramsar site.**

Relevant LFRMS actions	Potential hazards	Potential for likely significant effect
Look for opportunities to reduce flood risk to critical infrastructure whilst upgrading the existing drainage infrastructure.	• Changes in water levels or table • Changes in water chemistry • Surface water flooding changes • Toxic contamination	This action aims to review Site Waste Management Plan (SWMP) outputs in relation to critical infrastructure. This action is an investigation into physical interventions, construction works or changes in water management, and so at present is not likely to have a significant adverse effect on the interest features of the SPA or Ramsar site. However, on implementation, these schemes are likely to be subject to further authorisations, either through the planning process and/or another consenting process. Before any physical works or water management actions are implemented, they will be subject to the requirements of the Habitats Regulations as a matter of law and government policy. An Appropriate Assessment would be required where such works/actions are likely to have a significant adverse effect on the integrity of a European site. Therefore, it can be reasonably concluded at this stage that implementation of this measure is not likely to have a significant adverse effect on the SPA or Ramsar site. **Conclusion: No likely significant effect on the Thames Estuary SPA and Ramsar site.**
Areas of Critical Drainage (AoCD) Specific Actions		
Improvements to drainage maintenance: Victoria Road Brook	• Changes in water levels or table • Changes in water chemistry • Surface water flooding changes • Toxic contamination	The majority of planned investigations into potential drainage infrastructure and maintenance works are located over 5km from the Thames Estuary SPA and Ramsar site. However, this action aims to confirm with the Environment Agency the maintenance regime for Victoria Road Brook, which is located approximately 2km from the site boundary. As this action is an investigation into physical interventions, construction works or changes in water management, and any potential works will be relatively small-scale and local in impact, at present it is not likely to have a significant adverse effect on the interest features of the SPA or Ramsar site. Therefore, it is unlikely that hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. On implementation, these schemes are likely to be subject to further authorisations, either through the planning process and/or another consenting process. Before any physical works or water management actions are implemented, they will be subject to the requirements of the Habitats Regulations as a matter of law and government policy. An Appropriate Assessment would be required where such works/actions are likely to have a significant adverse effect on the integrity of a European site. Therefore, it can be reasonably concluded at this stage that implementation of this measure is not likely to have a significant adverse effect on the SPA or Ramsar site. **Conclusion: No likely significant effect on the Thames Estuary SPA and Ramsar site.**
Improvements to drainage infrastructure: Bramleys and Russet Close	• Changes in water levels or table • Changes in water chemistry • Surface water flooding changes • Toxic contamination	The majority of planned investigations into potential drainage infrastructure and maintenance works are located over 5km from the Thames Estuary SPA and Ramsar site. However, this action aims to investigate the impact of extra gullies along Bramleys and Russet Close on flooding in the Dunstable Road area, which is located approximately 2km from the site boundary. As this action is an investigation into physical interventions, construction works or changes in water management, and any potential works will be relatively small-scale and local in impact, at present it is not likely to have a significant adverse effect on the interest features of the SPA or Ramsar site. Therefore, it is unlikely that hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. On implementation, these schemes are likely to be subject to further authorisations, either through the planning process and/or another consenting process. Before any physical works or water management actions are implemented, they will be subject to the requirements of the Habitats Regulations as a matter of law and government policy. An Appropriate Assessment would be required where such works/actions are likely to have a significant adverse effect on the integrity of a European site. Therefore, it can be reasonably concluded at this stage that implementation of this measure is not likely to have a significant adverse effect on the SPA or Ramsar site. **Conclusion: No likely significant effect on the Thames Estuary SPA and Ramsar site.**

Table A-5: Assessment conclusions

In reference to the site interest features and their conservation objectives, describe any likely direct, indirect or secondary effects from the uncompleted and/or continuing consented activities of the project (either alone or in combination with other plans or projects) likely to give rise to significant effects on the European/Ramsar Site.	The LFRMS seeks to promote more sustainable flood risk management and includes objectives that aim to reduce the impacts of surface water flooding, promote better management of water resources and deliver a range of wider environmental benefits including new wetland habitat creation. Only a small number of LFRMS actions could potentially result in physical interventions or construction work, or directly affect water management practices. At this stage, the works are still under investigation and are relatively small-scale and local in impact. Therefore, it is unlikely that hazards will arise on the sensitive interest features as a result of implementation of the LFRMS. Until these measures are developed further, it is not possible to reasonably predict whether any potential adverse effects are likely to occur. Nonetheless, implementation of any measures that could result in significant adverse effects on a European site would therefore conflict with the objectives of the LFRMS. Therefore, it can be reasonably concluded at this stage that the LFRMS is not likely to have a significant adverse effect on the Thames Estuary SPA and Ramsar site. This conclusion does not preclude the need for further HRA at subsequent stages of the development and implementation of the LFRMS.
Is the project likely to have a significant effect 'alone'?	No
If there is no likely significant effect 'alone', are there other projects or plans that in-combination with the project being assessed could affect the site?	No
Is the project likely to have a significant effect 'in-combination'?	No
List of agencies consulted (Contact name and telephone/email address)	
NE Consultation response comments: **NE Signature:**	

A.1 References

http://jncc.defra.gov.uk

B Appendix B: Review of policies, plans and programmes

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
International				
EU Sustainable Development Strategy (revised 2006)	Outlines the need for economic growth to support social progress and respect the environment to achieve sustainable development.	The strategy aims to limit climate change and manage natural resources more responsibly, issues which are directly relevant to flood risk. Provides direction for the LFRMS in the managing of natural resources for flood risk	The LFRMS should seek to promote objectives that deliver sustainable FRM and sustainable development.	• Biodiversity, flora and fauna • Water environment
European Biodiversity Strategy to 2020	Outlines strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020.	Aims include the provision of better protection for ecosystems and fish stocks, promotion of green infrastructure and tighter controls on invasive alien species.	The LFRMS may contribute to the aims of the strategy through the provision of new green infrastructure to manage flood risk. In contrast, the strategy may limit certain FRM objectives if they are shown to be likely to adversely affect biodiversity or ecosystem services.	• Biodiversity, flora and fauna
EC Birds Directive – Council Directive 2009/147/EEC on the conservation of wild birds	Provides for protection of all naturally occurring wild bird species and their habitats, with particular protection of rare species.	Designates Special Protection Areas (SPAs) to protect birds and their habitats. The LFRMS objectives should avoid any significant adverse effect on these sites and supporting features. Requires LFRMS to be assessed for potential impact.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on a SPA.	• Biodiversity, flora and fauna
EC Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks	Aims to reduce and manage the risk of flooding and associated impacts on the environment, human health, heritage and economy. Principle requirement is the preparation of FRM plans at River Basin District level, together with preliminary flood risk assessments and hazard/risk maps.	Provides strategic direction to reduce impacts of flooding and promote enhanced FRM. The LFRMS will need to demonstrate compliance with the requirements of the Directive.	None likely as the LFRMS will seek to contribute to achieving the Directive.	• Water environment • Climate
EU Groundwater Directive – Directive 2006/118/EC on the protection of groundwater against pollution and deterioration	Establishes a regime that sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater. Implemented in the UK through the Environmental Permitting Regulations (2010).	Water quality is relevant to the LFRMS as flooding is linked to water pollution and a reduction in surface water and groundwater quality.	Improved FRM may benefit groundwater quality by reducing the risk of water pollution during a flood event. LFRMS objectives would need to consider potential impacts on groundwater and may be restricted if they contribute to an adverse impact.	• Water environment
EC Habitats Directive – Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora	Principle aim is to promote the maintenance of biodiversity by requiring Member States to take measures to restore habitats and species to favourable conservation status. Introduces robust protection for habitats and species of European importance. Enables the creation of Special Areas of Conservation (SACs) in order to establish a coherent ecological network of protected sites. Encourages protection and management of flora and fauna and supporting landscapes through planning and development policies.	Designates SACs to protect and promote biodiversity. The LFRMS objectives should avoid any significant adverse effect on these sites and supporting features. Requires LFRMS to be assessed for potential impact.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on a SAC.	• Biodiversity, flora and fauna
Urban Wastewater Treatment Directive – Directive	Aims to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.	Defines requirements for the collection and treatment of waste water in line with the population equivalent. LFRMS would need to	The LFRMS could support the aims of the Directive by reducing the risk of flooding to water treatment sites. However, LFRMS objectives	• Water environment

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
91/271/EEC concerning urban waste water treatment		consider potential impact of FRM objectives on water treatment sites.	may be restricted if they are shown to be likely to effect on wastewater discharges during flood events.	
EU Water Framework Directive – Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy	Establishes framework for protection of inland surface waters, transitional waters, coastal waters and groundwater to prevent pollution, promote sustainable water use, protect the aquatic environment, improve the status of aquatic ecosystems and mitigate the effects of floods and droughts.	Member states must prepare River Basin Management Plans and programme of measures for each River Basin District that sets out a timetable approach to achieving the WFD objectives. Places requirements on all relevant authorities to ensure their actions do not contravene the objectives of the Directive.	May restrict certain FRM options if likely to inhibit achievement of WFD objectives and detailed programme of measures. FRM options may be strengthened if they actively contribute to meeting the WFD requirements.	• Biodiversity, flora and fauna • Water environment
National				
Securing the Future – the UK Government Sustainable Development Strategy (2005)	Establishes a broad set of actions and priorities to support the achievement of sustainable development. It includes measures to enable and encourage behaviour change, measures to engage people, and ways in which the Government can promote sustainability.	Includes high level aims to promote sustainable development and sets out how local authorities can contribute to delivering this and the improvement of the local environment.	The LFRMS can contribute to sustainable development through the promotion of better FRM to benefit people, the economy and the environment.	• Population • Material assets
Flood and Water Management Act (2010)	Designates Lead Local Flood Authorities (LLFAs) who *'must develop, maintain, apply and monitor a strategy for flood risk management in its area'.* Applies to ordinary watercourses, surface runoff and groundwater.	Provides key driver for production of LFRMS and sets strategic direction.	None	• Water environment • Climate
Flood Risk Regulations (2009)	Implements the requirements of the EU Floods Directive, which aims to manage the risk of flooding and associated socio-economic and environmental impacts. Requires LLFAs to manage flooding from surface runoff.	Key driver for implementing FRM strategies at the local level.	None	• Water environment • Climate
Water for People and the Environment, Water Resources Strategy for England and Wales (2009)	Sets out the approach to sustainable water resources management throughout England and Wales to 2050 and beyond to ensure that there will be sufficient water for people and the environment.	FRM measures are linked to wider water resources management issues and both aspects can actively contribute to achieving corresponding objectives.	None	• Water environment • Population • Climate
Future Water, The Government's water strategy for England (2008)	Future Water defines future objectives for the water sector by 2030 and implementation steps on achieving the objectives. It includes objectives to reduce flood risk from rivers and the coast; improve the sustainable delivery of water supplies; improve the quality of the water environment through greater protection; and more effective management of surface water , which includes the promotion of SuDS, water reuse and above-ground storage;	The strategy includes provisions that seek to better manage surface water drainage and reduce flood risk, and the LFRMS could actively contribute to achieving these objectives.	The strategy promotes greater protection of the water environment, reduced water pollution and enhanced ecological quality of watercourses. The strategy may restrict certain FRM options if they are likely to inhibit achievement of these wider environmental objectives.	• Water environment
Making Space for Water – taking forward a new Government strategy for flood and coastal erosion risk	Aims to provide strategic direction to deliver sufficient space for water and enable more effective management of coastal erosion and flooding to benefit both people and the economy. The aim being to address these issues to mitigate their impact and to achieve environmental and social benefits.	National guidance regarding FRM is directly relevant to the LFRMS. The LFRMS can contribute to its aims, including promoting greater land management and land use	None	• Water environment • Population • Climate

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
management in England (2005)		planning, and integrated urban drainage management.		
The National Flood and Coastal Erosion Risk Management Strategy for England (2011)	Provides strategic direction to manage and monitor flood and coastal erosion risks in England. It sets out responsibilities of different organisations including local authorities to reduce risks and sets out the requirements for LLFAs to develop LFRMS.	Key driver for implementing FRM strategies at the local level.	None	• Water environment • Population • Climate
Water Act (2003)	Sets out the framework for abstraction licensing, impoundments, water quality standards and pollution control measures, and includes measures for drought management and flood defence work in England and Wales.	FRM is one of the themes addressed by the LFRMS.	The strategy promotes greater protection of water resources and may restrict LFRMS objectives if they are likely to adversely affect water quality or sustainable resource management.	• Water environment
Water Act (2014)	Sets out the framework for abstraction licensing, impoundments, water quality standards and pollution control measures, and includes measures for drought management and flood defence work in England and Wales. Key reforms from the Water Act (2003) are the introduction of market reform.	Flood insurance is one of the themes addressed by the Water Act, therefore relevant to the LFRMS.	The strategy promotes greater protection of water resources and may restrict LFRMS objectives if they are likely to adversely affect water quality or sustainable resource management.	• Water environment
Draft Water Bill (2012)	Emerging national strategy aimed at improved regulation of the water industry, whilst increasing its resilience to natural hazards such as drought and floods. It includes provisions to better manage sustainable water abstraction and encourage the use of SuDS.	Aims to promote better management of water resources and reduce the risks of flooding.	The strategy promotes greater protection of water resources and may restrict LFRMS objectives if they are likely to adversely affect water quality or sustainable resource management.	• Water environment
The National Flood Emergency Framework for England (2011)	Sets out a strategic approach to emergency response planning to reduce the impacts of flooding and improve resilience.	The framework sets out organisational responsibilities and promotes a multi-agency approach to managing flooding events.	None	• Water environment
The Carbon Plan (2011)	The carbon plan sets out a vision for Britain powered by cleaner energy used more efficiently, with more secure energy supplies and stable energy prices and benefits from jobs and growth that a low carbon economy will bring. Key areas are electricity generation, eating homes and businesses and travel.	Carbon emissions, and the resulting climate change impacts, are highly relevant to the issue of FRM due to the likely increased flood risk resulting from climate change.	None	• Climate change
Building a Low Carbon Economy – the UK's Contribution to Tackling Climate Change (2008)	Puts forward a framework for adapting to climate change and associated threats as well as a case for increased resilience to climate change.	Emphasises the commitment to sustainable development and consideration of the potential impacts of climate change, including increased flooding.	The LFRMS may contribute to the aims of the strategy through the provision of measures to adapt to an increase in flood risk due to future climate change.	• Climate change
Climate Change Act (2008)	Establishes a definite target to reduce UK national carbon emissions by 80% by 2050, relative to a 1990 baseline. Requires the government to publish five yearly carbon budgets starting with the period 2008-2012. Sets targets to reduce	Emphasises the commitment to sustainable development.	The LFRMS will need to consider the carbon implications of its objectives and should seek to minimise emissions whilst promoting sustainable FRM.	• Climate change

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
	greenhouse gases, and puts in place funding and mechanisms to reduce and alter activities which contribute to the emission of these gasses.			
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystems (2011)	Sets out the Government's strategy for improving biodiversity in England up to 2020.	Flooding can have adverse impacts on biodiversity. However there may be opportunities for the LFRMS to provide for biodiversity enhancements, as well as reducing risks to habitats and species from flood events.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse impact on water quality or local biodiversity.	• Biodiversity, flora and fauna • Water environment
England Biodiversity Framework (2008)	The framework encourages a number of conservation aspects including the adoption of an ecosystem approach and to embed climate change adaptation principles in conservation action.	The LFRMS may include measures that would result in biodiversity enhancements across landscapes and restoring / improving habitats.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse impact on water quality or local biodiversity.	• Biodiversity, flora and fauna • Water environment
UK Biodiversity Action Plan (1994)	The UK BAP aims to maintain and enhance biological diversity within the UK and contribute to the conservation and enhancement of global diversity.	The LFRMS will need to consider the potential impacts of measures within it on important species and habitats that are within the District, including the various Sites of Special Scientific Interest.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse impact on water quality or local biodiversity.	• Biodiversity, flora and fauna • Water environment
National Wetland Vision (2008)	The Wetland Vision is of a future where wetlands are a significant feature of the landscape in which wildlife can flourish. It will be a future in which wetland heritage is recognised and safeguarded; where everyone can enjoy wetlands for quiet recreation and tranquillity. Vitally, it will be a future where wetlands are valued both for the roles they play in helping us deal with some of the challenges of the 21st century and in improving and sustaining our quality of life.	Preserving and restoring wetlands such as peatlands, rivers and lakes will help regulate surface water run-off, store flood water and recharge groundwaters. These actions that are part of the wetland vision could potentially link with measures within the LFRMS.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on wetland habitats within the Borough.	• Biodiversity, flora and fauna • Water environment
Wildlife and Countryside Act (as amended) (1981)	The Act is the principle mechanism for legislative protect of wildlife in Great Britain. The Act deals with the protection of birds, other animals and plants.	The Act provides for the notification of Sites of Special Scientific Interest and their protection and management. Any potential impacts of the LFRMS, including on SSSIs, will need to be considered through the SEA.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on a SSSI.	• Biodiversity, flora and fauna • Water environment
Natural Environment and Rural Communities (NERC) Act (2006)	Provides guidance for the protection and enhancement of important habitat and species.	Requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England.	May restrict certain FRM objectives if they are shown to be likely to have a significant effect on priority species or habitats.	• Biodiversity, flora and fauna • Water environment
Salmon and Freshwater Fisheries Act (1975)	Aims to regulate practice relating to freshwater fisheries and salmon fishing.	The Act's main purpose is to protect fish species. However, it does indirectly affect flood risk. Restricting the obstruction to passage of fish may have implications for flood risk, as this will prohibit the use of fish weirs and mill dams.	May restrict certain FRM objectives if they are shown to be likely to have an adverse effect on fish passage or compromise a waterbody from achieving Good status under the WFD.	• Biodiversity, flora and fauna • Water environment

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Contaminated Land (England) Regulations (2006)	Sets out provisions relating to the identification and remediation of contaminated land. The regulations identify contaminated land issues and pathways to pollution of surface, ground, estuarine and coastal water environments.	Although there is no heavy industry in Bromley, other light industries may have contaminated the land.	Flooding of contaminated land can have adverse impacts on factors such as biodiversity, water and soils	• Biodiversity, flora and fauna • Water environment • Soils
National Planning Policy Framework (2012)	The National Planning Policy Framework (NPPF) has replaced the set of national planning policy statements and national planning policy guidance notes, bringing them into one document. It sets high level national economic, environmental and social planning policy and includes a new presumption in favour of sustainable development.	The NPPF has replaced PPS25 along with the other PPSs and PPGs, and so comprises the national policy framework in relation to planning in areas of higher flood risk. The NPPF restricts development that would adversely affect sites European sites, designated sites, including Green Belt, Sites of Special Scientific Interest (SSSIs) and Areas of Outstanding Natural Beauty (AONB), as well as locations at risk of flooding or coastal erosion.	The strategy could restrict LFRMS objectives if they are shown to have a significant adverse effect on sensitive ecological and landscape sites in the Borough.	• Biodiversity, flora and fauna • Water environment • Landscape • Historic environment • Population • Soils
PPS5: Planning for the Historic Environment Practice Guide (2010)	The guide assists local authorities, owners, applicants and other interested parties in implementing the policy *Planning Policy Statement 5 (Planning for the Historic Environment)*.	Provides guidance on how to conserve historic assets. This will provide advice on how to develop around historic assets, as well as ways best to conserve them from flooding.	May restrict certain FRM objectives if they are shown to be likely to have an adverse effect on historic assets in the Borough.	• Historic environment.
Historic Environment Good Practice Advice in Planning: Historic Environment Records (2014)	Provides information on good practice to assist local authorities, planning and other consultants, owners, applicants and other interested parties in implementing historic environment policy in the NPPF. Assists with access to Historic Environment Records.	Guide helps to assist in sustainable development, in helping with access to Historic Environment Records which has information about various historic assets.	None.	• Historic environment
Historic Environment Good Practice Advice Guide in Planning: Note 3: The Setting of Heritage Assets.	Provides information on good practice to assist local authorities, planning and other consultants, owners, applicants and other interested parties in implementing historic environment policy in the NPPF. Provides advice on the setting of historic assets, and how to understand the setting.	Understanding the setting of a historic assets will assist in design development of FRM measures.	May restrict certain FRM objectives if they are shown to be likely to have an adverse effect on historic assets in the Borough.	• Historic environment
Regional / Local				
Thames Catchment Flood Management Plan (2009)	The CFMP provides an overview of the flood risk in these catchments and set out the preferred surface water management strategy for future years. They outline the wider context for managing flood risk in London.	The CFMP provides important context for the LFRMS and set the strategic direction for managing flood risk from main rivers.	None	• Water environment
South Essex Catchment Flood Management Plan (2009)	The CFMP provides an overview of the flood risk in these catchments and set out the preferred surface water management strategy for future years. They outline the wider context for managing flood risk in South Essex.	The CFMP provides important context for the LFRMS and set the strategic direction for managing flood risk from main rivers.	None	• Water environment
Thames Estuary 2100 Strategy (2012)	Provides recommendations for FRM for London and the Thames Estuary.	Provide important context for the LFRMS.	None	• Water environment

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Thames Gateway Delivery Plan (2009)	Europe's largest regeneration project, which stretches along the Thames Estuary. The plan provides a structure for positive change in the area, a strong economy, improvements in quality of life and development of the Gateway as an eco-region.	Developing an eco-region could include water courses and wetland areas.	The LFRMS will need to consider development policies set out in the plan. May restrict certain FRM options if likely to inhibit achievement of the strategy objectives.	• All
Managing Water Resources & Flood Risk in the South East (2005)	Provides levels of strategic assessment of flood risk across the region.	Provide broad context for the LFRMS.	None	• Water environment
London Rivers Action Plan (2009)	A tool to help restore rivers for people and nature. Provides guidance regarding improving the wildlife and amenity value of London rivers. Key aspirations include the improvement of flood management using more natural processes; reducing the likely negative impacts of climate change; reconnecting people to the natural environment through urban regeneration; and enhancing habitats for wildlife.	The watercourses within Bromley and surface water flooding are a key feature of the LFRMS.	The LFRMS will need to consider these aspirations in a local context and should seek ways	• Water environment • Biodiversity, flora and fauna
Thames River Basin Management Plan	The Thames River Basin Management Plan (RBMP) has been prepared to meet the requirements of the EU Water Framework Directive. It focuses on actions to address the protection, improvement, sustainable use of water and other pressures facing the water environment in the Thames River Basin.	Water quality and quantity is linked to the LFRMS as flooding events can lead to water pollution and changes in water levels.	May restrict certain FRM options if likely to inhibit achievement of WFD objectives and detailed programme of measures. FRM options may be strengthened if they actively contribute to meeting the WFD requirements.	• Water environment
Thames Flood Risk Management Plan (2015 – Draft)	Unable to be reviewed as the draft has been closed to consultation.			
Thurrock Council Local Air Quality Action Plan (2004)	Details how Thurrock Council intends to improve air quality within its fifteen AQMAs.	Provides information on regional policies to improve air quality in the borough.	None	• Air quality
Thurrock environmental Vision and Policy (2013)	Sets the high level framework for the Council's work to deliver the Community Strategy priority for promoting and protecting our clean and green environment.	Provides information on environmental priorities and vision.	The LFRMS may need to consider environmental policies, which may restrict certain FRM options.	• Biodiversity, flora and fauna • Water environment
Essex County Council Preliminary Flood Risk Assessment (2011)	Provides a high level review of flood risk from surface water, groundwater and ordinary watercourses across the county.	The flood risk assessment provides an important local context for the LFRMS.	None	• Water environment
Thurrock Strategic Flood Risk Assessment Level 1 Report (2009) and Level 2 Report (2010)	Provides a review of flood risk across the borough, steering all development towards areas of lowest risk.	The flood risk assessment provides an important local context for the LFRMS.	None	• Water environment
Thurrock Transport Strategy 2013-2026 (2013)	Sets out the aims, objectives and a series of policies for delivering transport improvements in Thurrock.	Important transport infrastructure may be at risk of flooding and the LFRMS offers potential benefits through better FRM.	None	• Material assets • Population • Air quality

Plan/Policy/Programme	Overview	Relevance to LFRMS	Conflict with LFRMS	Primary SEA topic
Thurrock Local Development Framework Core Strategy and Policies for Management of Development (2011)	The policies cover spatial development issues in relation to education, health, community safety, energy management, sustainable development, climate change and flood management.	The strategy provides direction for the future development of the Borough, and includes policies relating to flooding.	The LFRMS will need to consider development policies set out in the strategy. May restrict certain FRM options if likely to inhibit achievement of the strategy objectives.	• All
Thurrock Council Surface Water Management Plan (2014)	Considers flooding from sewers, drains, groundwater and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall.	The management plan identifies measures to help alleviate surface water flooding. The LFRMS will also provide measures that alleviate surface water flooding.	The LFRMS will need to consider the measures outlined in the management plan.	• Water environment
Sustainable Community Strategy Thurrock 2020 (2009)	Sets out how Thurrock will achieve its ambitions of a sustainable community.	The strategy provides direction for the future development of the Borough, particularly regeneration.	The LFRMS will need to consider development policies set out in the strategy.	• All
Essex Biodiversity Action Plan (2011)	Details the priorities for habitats and species and offers practical measures which can be implemented to achieve the conservation of the areas biodiversity heritage. The content of the plan is informed and guided by national targets so that its implementation is firmly linked to national priorities.	Objectives include the improvement of water quality, removal of barriers to aquatic species and enhancement of wetland and riverine habitats and connectivity and the issue of invasive species.	Objectives of the Essex BAP are linked to those of the WFD to enhance biodiversity and improve water quality status.	• Biodiversity, flora and fauna
Thurrock Biodiversity Action Plan 2007-2012	Identifies key biodiversity habitats and species for Thurrock and aims to raise awareness, outline an action programme and encourage developers to integrate biodiversity.	Objectives include maintain existing areas of habitats and to ensure habitats are managed and maintained.	Objectives of the Thurrock BAP are linked to WFD measures to enhance biodiversity.	• Biodiversity, flora and fauna.
Essex County Council Adapting for Climate Change – Action Plan (2014)	Highlights the types of severe climatic events possible in the future and the impact these could have on services. Sets out measures to adapt and build resilience to these types of events.	FRM actions can contribute to the provision of adaptation measures to benefit people and biodiversity. FRM activities will generate carbon emissions.	The LFRMS will need to demonstrate that it can deliver improved FRM whilst minimising the level of associated carbon dioxide emissions.	• Climate

C Appendix C – Consultation Responses

Consultee	Comment received	Response / Action
Environment Agency (7 September 2015)	Page 6. It mentions a section 2.6.7 which has been inserted that should contain further detail on installation of structures and WFD. This new section is absent from the SEA on pages 28-29.	Page 6 has been amended to read section 2.6.6, which addresses the scoping consultation comment.
	Page 25. White-clawed crayfish are mentioned as present in the Borough. To our knowledge there are no white-clawed crayfish populations in Thurrock or most of the rest of Essex, see http://www.essexrivershub.org.uk/index.php/recent-news/492-last-known-population-of-white-clawed-crayfish-in-essex-could-be-in-trouble Therefore there is no need to mention them further in the document, unless ark sites are to be created for them in the Borough.	The reference to White-clawed crayfish has been retained as it is included in Essex Biodiversity Project's Species Action Plan. A sentence has been included on page 25: *White-clawed Crayfish however are not present in within the Borough, and the last known river-based population in Essex is at risk.* Reference to White-clawed Crayfish has been removed from page 25.
Natural England (7 September 2015)	Overall, we note that the Actions listed in the LFRMS are generally investigative or communicative in their nature, and as such (and at this stage) do not comprise many activities on the ground which could lead to environmental impacts (whether positive or negative). This is told out by the largely neutral appraisal of LFRMS objectives, especially with respect to SEA Objectives linked to the natural environment / biodiversity.	No action required.
	The Environmental Report makes reference to some projects requiring works on the ground to alleviate flooding hot spots, and we considered that these are sufficiently localised and distant from designated sites of nature conservation interest to not present significant impacts. The Report carries the intention to defer much of the assessment of environmental impacts of its projects to later stages of assessment, and so the Council needs to ensure that these are carried out, and appropriately audited, to ensure its aims and objectives are fully realised and reported.	No action required.
	We are satisfied with the objectives and indicators proposed, and have no specific comments to make.	No action required.
	Habitats Regulations Assessment We have reviewed the HRA integrated within the Environmental Report. The scope of the HRA is precautionary (15km from the authority boundary) and therefore encompasses (and rules out) impacts to European sites some distance from the source of impact. We consider that the "hazards and effects" are appropriately considered. It is not always clear what the implications of some LFRMS Actions are for European sites without further interrogation of the LFRMS itself (outside the scope of this consultation), however we are generally satisfied with the consideration of impacts to European sites, and overall agree with the conclusion reached, that the LFRMS is not likely to have a significant effect to European sites (and in particular the Thames Estuary and Marshes Special	No action required.

Consultee	Comment received	Response / Action
	Protection Area and Ramsar site).	
Historic England (1 September 2015)	We welcome the clarification and amendments to the baseline information specifically: • Inclusion at 2.8 relating to unrecorded archaeology, including buried archaeology, waterlogged archaeological and palaeo-environmental remains. • The use of Figure 2.9 which highlights designated heritage assets and their locations in Thurrock. • Consideration of Heritage at Risk at Section 2.8 on page 31.	No action required.
	It is recommended that the consideration of non-designated heritage assets is made clear in this section. The Historic Environment of Thurrock is more than just the sum of its designated heritage assets; non-designated assets make up an important and valued part of this and it is important that they are acknowledged as their protection is required by the NPPF. Therefore non-designated heritage assets should be acknowledged and their consideration reflected clearly within the baseline of the SEA.	A paragraph on page 32 has been included: *There are many heritage assets within Thurrock, including designated and non-designated heritage assets. Non-designated heritage assets' protection is a requirement of the NPPF, therefore should be considered during implementation of the LFRMS actions.*
	SEA Framework Our concerns however remain with regard to the non-inclusion of the recommended sub-objectives. Sub-objectives are considered important to achieve consistency and clarity and to ensure that all key heritage issues are appropriately considered and potential effects appropriately assessed.	Sub-objectives have not been included as this is a high level strategic assessment of environmental effects from FRM measures.
	It should be noted that we have not had the opportunity to look into impacts on the Historic Environment of individual Flood Risk Management methods and proposals, as outlined within the Thurrock LFRMS itself. Historic England there reserves the right to comment on or formally object to individual proposals as they arise.	No action required.
	Please note that any reference to 'English Heritage' within the document should be changed to 'Historic England'.	English Heritage has been amended to Historic England.

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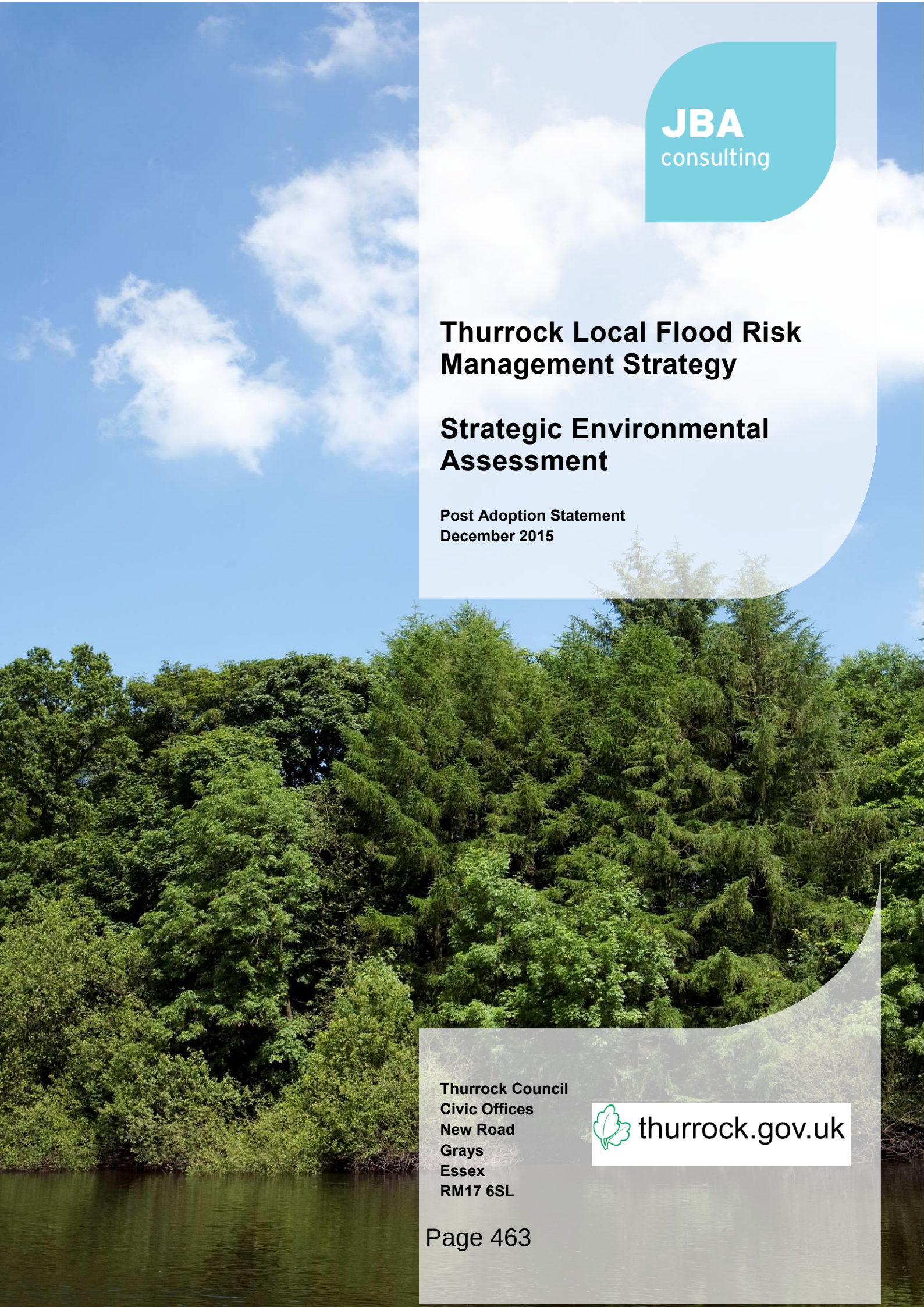

Thurrock Local Flood Risk Management Strategy

Strategic Environmental Assessment

Post Adoption Statement
December 2015

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Revision history

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v1-0 / 3 December 2015		Thurrock Council

Contract

This report describes work commissioned by Thurrock Council. Rachel Drabble and David Revill of JBA Consulting carried out this work.

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Reviewed by ..... David Revill BSc MSc CEnv MIES
Principal Environmental Consultant

Purpose

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Contents

List of tables

Abbreviations

FRM ..... Flood Risk Management

FWMA ..... Flood and Water Management Act

HRA ..... Habitats Regulations Assessment

LFRMS ..... Local Flood Risk Management Strategy

LLFA ..... Lead Local Flood Authority

RMA ..... Risk Management Authority

SEA ..... Strategic Environmental Assessment

SuDS ..... Sustainable Drainage Systems

WFD ..... Water Framework Directive

1 Introduction

1.1 Thurrock Local Flood Risk Management Strategy

The Flood and Water Management Act (FWMA) was passed in April 2010. It aims to improve both flood risk management and the way we manage our water resources. The FWMA creates clearer roles and responsibilities and instils a more risk-based approach to flood risk management. This includes a new lead role for the Council as a Lead Local Flood Authority (LLFA) in managing and leading on local flood risk management from surface water, groundwater and ordinary watercourses.

Under the requirements of the FWMA, the Council must develop, maintain, apply and monitor a Local Flood Risk Management Strategy (LFRMS) for local flood risk management in its area. The LFRMS provides a delivery vehicle for improved flood risk management and supports the development of partnership funding and a strategic investment programme.

The LFRMS will set out:

- The roles and responsibilities for each Risk Management Authority (RMA) and their flood risk management functions; and
- Opportunities, objectives and measures for flood risk reduction of existing communities, including ways to minimise the risk from future growth.

Development of the LFRMS provides considerable opportunities to improve and integrate land use planning and flood risk management. It is an important tool to protect vulnerable communities and deliver sustainable regeneration and growth.

1.2 Strategic Environmental Assessment process

Strategic Environmental Assessment (SEA) is a statutory assessment process required under the *Environmental Assessment of Plans and Programmes Regulations 2004* (the 'SEA Regulations'). These regulations transpose into UK law the requirements of the European Directive 2001/42/EC *on the assessment of the effects of certain plans and programmes on the environment* (the 'SEA Directive')[1]. The SEA Directive requires formal assessment of plans and programmes which are likely to have significant effects (either positive or negative) on the environment. It applies to all plans and programmes which are *'subject to preparation and/or adoption by an authority at national, regional or local level'* or are *'required by legislative, regulatory or administrative provisions'* (ODPM, 2004).

Local Government Association (LGA) guidance (LGA, 2011) on the production of the LFRMS identifies the likely requirement for an SEA, stating that *'the Local [Flood Risk Management] FRM Strategy is likely to require statutory SEA, but this requirement is something the [Lead Local Flood Authority] LLFA must consider'*. A SEA screening process was therefore undertaken and the Council has confirmed the requirement for its LFRMS to undergo SEA.

SEA involves the systematic identification and evaluation of the potential environmental impacts of the LFRMS. This information is then used to aid the selection of a preferred option(s) for the strategy, which are those that best meet its economic, environmental and social objectives, and legal requirements.

The full range of environmental receptors have been considered through the SEA. This meets the requirements of the SEA Directive, which requires that an assessment identifies the potentially significant environmental impacts on 'biodiversity, population, human health, fauna, flora, soil, water, air, climatic, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors'[1].

The ODPM guidance sets out a five stage process (A to E) to be followed (see Table 1-1). The Report addresses stage D of the SEA process wherein the Environmental Report and LFRMS are consulted on.

[1] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

Table 1-1: Stages in the SEA process

SEA Stage	Purpose
Stage A:	Setting the context and objectives, establishing the baseline and deciding on the scope
Stage B:	Developing and refining alternatives and assessing effects
Stage C:	Preparing the Environmental Report
Stage D:	Consulting on the draft plan or programme and the Environmental Report
Stage E:	Monitoring the significant effects of implementing the plan or programme on the environment.

1.3 Purpose of the SEA statement

Article 9 of the SEA Directive requires that when a plan or programme is adopted, the consultation bodies, the public and any other Member States consulted on the Environmental Report are informed and the following specific information is made available:

- The plan as adopted;
- A statement summarising:
    i. How environmental considerations have been integrated into the draft LFRMS (Section 2);
    ii. How the Environmental Report has been taken into account (Section 3);
    iii. How opinions expressed in response to the consultation on the Environmental Report have been taken into account (Section 4);
    iv. The reasons for choosing the LFRMS, as adopted, in the light of the other reasonable alternatives dealt with (Section 5); and
    v. The measures that are to be taken to monitor the significant environmental effects of the implementation of the LFRMS (Section 6).

The purpose of this Post-adoption Statement is to provide the specific information outlined under each of the points listed (i) to (v) above and which is present in the following sections of this statement.

2 How environmental considerations have been integrated into the LFRMS

The SEA was undertaken to assist the preparation of the LFRMS to identify and appraise potential significant environmental effects and put forward recommendations to mitigate these effects and improve the LFRMS. The aim was to ensure that the LFRMS promotes positive environmental outcomes and that any significant negative effects are effectively mitigated or avoided when the LFRMS is implemented through new flood risk management activities within Thurrock.

SEA objectives were developed for the Thurrock LFRMS to assist in the identification of significant environmental effects. The objectives and actions contained within the draft LFRMS were then assessed to determine whether they contribute to or conflict with achievement of the SEA objectives. The outputs of this process were documented in a draft SEA Environmental Report, which was sent to the three statutory consultation bodies (Natural England, Environment Agency and Historic England) together with the draft LFRMS in order to gain their views. Following this consultation, a number of LFRMS objectives and actions were amended. Further environmental assessment was then undertaken to assess the environmental effects associated with these changes. The outcomes of this work were described in the final SEA Environmental Report.

Table 2-1 summarises the recommendations made by the SEA and shows how the recommendations have been responded to in the LFRMS.

Table 2-1: How the environmental report has been taken into account in the LFRMS

SEA recommendation	Final decision
LFRMS to be strengthened by considering the SEA objectives as a whole to ensure delivery of a sustainable approach.	The LFRMS has been updated to take account of the SEA objectives to ensure that LFRMS actions will be delivered in a sustainable way.
LFRMS objectives should be integrated so that delivery of individual actions do not conflict with achievement of the wider strategy objectives.	LFRMS actions will be undertaken with consideration of the wider Strategy objectives.
Proposals should be assessed to determine their potential environmental effects (positive and negative) in advance of implementation and appropriate mitigation measures are built into their delivery as required.	As actions identified in the strategy are investigated in more detail, further environmental assessment will be undertaken during the feasibility stages to identify what appropriate mitigation measures may be required for their delivery.
LFRMS should seek to maximise the potential environmental benefits associated with delivery of the objectives and actions.	LFRMS has been updated to include more explicit reference to WFD and the environment and how the Strategy will seek to maximise environmental benefits during deliver of the objectives and actions.

The Conservation of Habitats and Species Regulations (2010) ('Habitats Regulations'), impose a requirement to undertake a Habitats Regulations Assessment (HRA) for spatial plans to determine whether the effects of those plans would be likely to have a significant adverse impact on the conservation objectives of a European protected site. A HRA screening assessment was therefore undertaken to inform the development of the LFRMS. The screening assessment found that the LFRMS is not likely to have a significant adverse effect on a European site. Consultation with Natural England was undertaken, which confirmed the outcomes of the screening assessment.

3 How the Environmental Report has been taken into account

The Environmental Report and LFRMS were developed in parallel so that the SEA process could inform the development of the final LFRMS. Table 3-1 shows the SEA process and how it informed the development of the final LFRMS.

Table 3-1: Stages in preparing the SEA and LFRMS

SEA Stage	LFRMS stage
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope	Consultation on LFRMS objectives and actions with key stakeholders.
Stage B: Developing and refining alternatives and assessing effects	Developing LFRMS objectives and actions.
Stage C: Preparing the Environmental Report	Preparing the draft LFRMS.
Stage D: Consulting on the draft plan or programme and the Environmental Report	Review and update of the Environmental Report and LFRMS, following consultation.
Stage E: Monitoring the significant effects of implementing the plan or programme on the environment.	To be undertaken as the LFRMS objectives and actions are implemented.

In order to comply with the SEA Directive, the SEA has taken account of:

- The likely significance and timeframe of any impacts.
- Cumulative effects.
- Mitigation measures required to overcome and minimise adverse impacts.

The final LFRMS was produced in November 2015. No actions were amended and therefore the Environmental Report was not required to be updated.

4 How consultation on the Environmental Report has been taken into account

The consultation on the draft Environmental Report lasted for a period of six weeks, beginning on the 3 August 2015. Responses were received from the Environment Agency, Natural England and Historic England. Additionally, Natural England provided comments on the HRA screening assessment. The responses were mainly supportive of the approach to the SEA and included a variety of comments ranging from specific queries and details to general comments, mainly in relation to biodiversity and flooding. Appendix A shows how the consultation responses have been taken into account in the final plan.

No further comments were received during the preparation of the final Environmental Report.

Due to the relatively local scale and nature of the LFRMS, no trans-boundary consultations were undertaken or comments received under regulation 14 of the SEA Regulations.

5 Reasons for choosing the plan as adopted

The draft Environmental Report, published for consultation in August 2015 included three alternative management approaches for the LFRMS. These were:

1. **Do nothing**: where no action is taken and existing assets and ordinary watercourses are abandoned.
2. **Maintain current flood risk management regime**: where existing assets and watercourses are maintained as present in line with current levels of flood risk. Existing infrastructure is not improved over time and the effects of climate change are not taken into account; and
3. **Manage and reduce local flood risk**: take action to reduce the social, economic and environmental impact due to flooding.

Each of these alternatives were assessed against the SEA objectives to determine which would be the most appropriate approach to minimising adverse environmental effects and promoting positive effects. The SEA identified that implementation of the LFRMS (Option 3) is the best approach to manage flood risk in Thurrock in a balanced and sustainable manner.

6 Measures to be taken to monitor significant environmental effects of the implementation of the LFRMS

The SEA did not identify any significant negative effects. Conversely, a number of the LFRMS objectives and actions have the potential for both direct and indirect positive environmental effects. These effects will be monitored with the implementation of the LFRMS, following the approach identified in the Environmental Report and summarised in Table 6-1 below. Implementation of the LFRMS is guided primarily through a set of actions. The LFRMS aims to annually monitor the progress of the actions and how the objectives are being met.

Table 6-1: SEA monitoring framework

LFRMS objective / action	SEA objective(s)	Potential significant effects	Monitoring indicator	Possible monitoring and/or delivery partners
Objective 1 *Reduce the likelihood and consequence of flooding, particularly from surface water, groundwater and ordinary watercourses.*	9, 11 and 12	Introducing Flood Risk Management (FRM) measures with the objectives of reducing flood risk, therefore reducing harm to people, economy and society assists with the achievement of all these SEA objectives.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.	Thurrock Council Anglian Water Environment Agency Highways Agency
Objective 3 *Reduce the vulnerability of Thurrock, its residents and visitors to the detrimental effects of flooding.*	9, 11 and 12	Introducing FRM measures with the objectives of reducing flood risk, therefore reducing harm to people, economy and society assists with the achievement of all these SEA objectives.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.	Thurrock Council Anglian Water Environment Agency Highways Agency
Objective 7 *Improve natural habitat and the social environment through flood management schemes which provide multiple benefits.*	2, 3, 4, 5, 6, 9, 11 and 12	Improving FRM systems with the objectives of improving the environment as well as reducing harm to people, economy, environment and society assists with the achievement of all the SEA objectives.	Area of designated sites adversely affected by flooding. Monitoring of reported status of designated nature conservation sites. Percentage of land designated as nature conservation sites as a result of LFRMS measures. Area of habitat created as a result of implementation of the LFRMS (e.g. flood storage areas creating wetland habitat). Number of barriers to fish migration removed.	Thurrock Council Anglian Water Environment Agency Highways Agency

LFRMS objective / action	SEA objective(s)	Potential significant effects	Monitoring indicator	Possible monitoring and/or delivery partners
			Water quality and morphology of the borough's watercourses. Number of pollution incidents. Number of SuDS schemes installed as part of the LFRMS. Number and volume of Environment Agency licensed abstractions. Numbers of sites with high pollution potential (e.g. landfill sites, waste water treatment works) at risk from flooding. Achievement of Water Framework Directive (WFD) objectives. Percentage of water bodies achieving 'Good' ecological status/potential. No deterioration in WFD status. Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc.) at risk from flooding. Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding.	
Action 11 **Runoff rates and volumes** for new small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be controlled. *For all new developments:* *The peak runoff rate for the 1 in 1 year and 1 in 200 year runoff must not exceed the peak greenfield runoff rate for the same event.* *The runoff volume for the development site in the 1 in 200 year, 6 hour rainfall event must not exceed the runoff volume for the same event.*	10	Increase of Sustainable Drainage Systems (SuDS) schemes within the Borough through introducing ways to manage runoff.	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 12 **Runoff from development on previously developed sites** for small and large scale major developments (i.e. >10 dwellings, >1,000m2 built area) to be restricted to greenfield levels. *For previously developed sites the peak runoff rate (1 in 1 and 1 in 100 year) and volumes (1 in 100 year, 6 hour rainfall event) must not exceed the equivalent greenfield rates.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 13 **Green roofs/areas.** *Investigate opportunities to introduce green roofs/areas as and when sites become available for development.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 15 **Drainage improvements**: planning	10	Increase of SuDS schemes within the	Number of SuDS schemes installed as part of the	Thurrock Council

LFRMS objective / action	SEA objective(s)	Potential significant effects	Monitoring indicator	Possible monitoring and/or delivery partners
policy. *Use planning policy and advice regarding paving of driveways, using residential soakaways, water butts etc. Develop policy to resist the paving over of driveways.*		Borough through introducing ways to manage runoff	LFRMS.	Anglian Water Environment Agency
Action 16 **Drainage improvements**: preferential flow paths. *Identify programme of potential preferential flow path works e.g. contoured grass verges.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency
Action 32 **Preferential flow paths**: Hathaway Road. *Investigate the use of swales/French drains to attenuate and infiltrate runoff along Hathaway Road and reduce volumes of water ponding behind the rail embankment.*	10	Increase of SuDS schemes within the Borough through introducing ways to manage runoff	Number of SuDS schemes installed as part of the LFRMS.	Thurrock Council Anglian Water Environment Agency

A Appendix A – Consultation Responses

Consultee	Comment received	Response / Action
Environment Agency (7 September 2015)	Page 6. It mentions a section 2.6.7 which has been inserted that should contain further detail on installation of structures and WFD. This new section is absent from the SEA on pages 28-29.	Page 6 has been amended to read section 2.6.6, which addresses the scoping consultation comment.
	Page 25. White-clawed crayfish are mentioned as present in the Borough. To our knowledge there are no white-clawed crayfish populations in Thurrock or most of the rest of Essex, see http://www.essexrivershub.org.uk/index.php/recent-news/492-last-known-population-of-white-clawed-crayfish-in-essex-could-be-in-trouble Therefore there is no need to mention them further in the document, unless ark sites are to be created for them in the Borough.	The reference to White-clawed crayfish has been retained as it is included in Essex Biodiversity Project's Species Action Plan. A sentence has been included on page 25: *White-clawed Crayfish however are not present in within the Borough, and the last known river-based population in Essex is at risk.* Reference to White-clawed Crayfish has been removed from page 25.
Natural England (7 September 2015)	Overall, we note that the Actions listed in the LFRMS are generally investigative or communicative in their nature, and as such (and at this stage) do not comprise many activities on the ground which could lead to environmental impacts (whether positive or negative). This is told out by the largely neutral appraisal of LFRMS objectives, especially with respect to SEA Objectives linked to the natural environment / biodiversity.	No action required.
	The Environmental Report makes reference to some projects requiring works on the ground to alleviate flooding hot spots, and we considered that these are sufficiently localised and distant from designated sites of nature conservation interest to not present significant impacts. The Report carries the intention to defer much of the assessment of environmental impacts of its projects to later stages of assessment, and so the Council needs to ensure that these are carried out, and appropriately audited, to ensure its aims and objectives are fully realised and reported.	No action required.
	We are satisfied with the objectives and indicators proposed, and have no specific comments to make.	No action required.
	Habitats Regulations Assessment We have reviewed the HRA integrated within the Environmental Report. The scope of the HRA is precautionary (15km from the authority boundary) and therefore encompasses (and rules out) impacts to European sites some distance from the source of impact. We consider that the "hazards and effects" are appropriately considered. It is not always clear what the implications of some LFRMS Actions are for European sites without further interrogation of the LFRMS itself (outside the scope of this consultation), however we are generally satisfied with the consideration of impacts to European sites, and overall agree with the conclusion reached, that the LFRMS is not likely to have a significant effect to European sites (and in particular the Thames Estuary and Marshes Special	No action required.

Consultee	Comment received	Response / Action
	Protection Area and Ramsar site).	
Historic England (1 September 2015)	We welcome the clarification and amendments to the baseline information specifically: • Inclusion at 2.8 relating to unrecorded archaeology, including buried archaeology, waterlogged archaeological and palaeo-environmental remains. • The use of Figure 2.9 which highlights designated heritage assets and their locations in Thurrock. • Consideration of Heritage at Risk at Section 2.8 on page 31.	No action required.
	It is recommended that the consideration of non-designated heritage assets is made clear in this section. The Historic Environment of Thurrock is more than just the sum of its designated heritage assets; non-designated assets make up an important and valued part of this and it is important that they are acknowledged as their protection is required by the NPPF. Therefore non-designated heritage assets should be acknowledged and their consideration reflected clearly within the baseline of the SEA.	A paragraph on page 32 has been included: *There are many heritage assets within Thurrock, including designated and non-designated heritage assets. Non-designated heritage assets' protection is a requirement of the NPPF, therefore should be considered during implementation of the LFRMS actions.*
	SEA Framework Our concerns however remain with regard to the non-inclusion of the recommended sub-objectives. Sub-objectives are considered important to achieve consistency and clarity and to ensure that all key heritage issues are appropriately considered and potential effects appropriately assessed.	Sub-objectives have not been included as this is a high level strategic assessment of environmental effects from FRM measures.
	It should be noted that we have not had the opportunity to look into impacts on the Historic Environment of individual Flood Risk Management methods and proposals, as outlined within the Thurrock LFRMS itself. Historic England there reserves the right to comment on or formally object to individual proposals as they arise.	No action required.
	Please note that any reference to 'English Heritage' within the document should be changed to 'Historic England'.	English Heritage has been amended to Historic England.

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Actions						OBJECTIVES												Action Owners/Partners			Other stakeholders	SWMP Priority	Possible funding sources	Indicative cost	Thames CFMP		South Essex CFMP		TE2100 Plan		Thames RBMP - identified actions	Thames FRMP					Notes - particularly timing and investment factors	Strategy Priority
						National Objectives					Local Objectives																											
ID	What?	How?	Ward	Area of Critical Drainage	Action Type	N1	N2	N3	N4	N5	L1	L2	L3	L4	L5	L6	L7	L8	Lead Organisation	LLFA Dept	Support					Thames Sub Unit	Policy	South Essex Sub Area	Policy	Action Zone	Policy		Management Catchment	Objective	Measure	Priority	Status		
BOROUGH WIDE ACTIONS																																						
1	Raise **awareness of AoCD** amongst Planners and influence planning policies to prevent the creation of new risk areas	Include Planners and planning policy influencers in awareness raising activities Ensure AoCD information is clear and accessible	ALL	ALL	Communication / Partnerships	✔	✔				✔				✔				Thurrock Council	Spatial Planning	Thurrock Flood Partnership	EA, Anglian Water	Medium	Thurrock Council / Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Establish a working framework between RMAs	M4 - Preparedness	High	Not started - agreed		High
2	**Community awareness**	Increase awareness of flooding within communites at risk through newsletters, website, drop-in surgeries etc. To include information on who to contact during flooding, flood warning services and how to access them, how to prepare for flooding, as well as the role of Thurrock as LLFA.	ALL	ALL	Communication / Partnerships	✔			✔	✔			✔		✔				Thurrock Council	Flood Risk Mgr / Emergency Planning / Civil Contingencies	Local residents	EA, Anglian Water, Essex Fire & Rescue	Medium	Thurrock Council / Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Raise community awareness	M4 - Preparedness	Very High	On-going		High
3	**Community awareness**	Update Council webpages to highlight the impact of fly tipping on flood risk.	ALL	ALL	Communication / Partnerships	✔		✔	✔		✔		✔		✔				Thurrock Council	Flood Risk Mgr / Waste	Local residents		Medium	Thurrock Council	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Raise community awareness	M4 - Preparedness	Very High	On-going		High
4	**Community awareness**	Provide information on Council webpages regarding importance of good drainage practice / drainage maintenance and promote to local landowners.	ALL	ALL	Communication / Partnerships	✔		✔	✔		✔		✔		✔				Thurrock Council	Flood Risk Mgr / Highways / Transportation	Landowners	EA, Anglian Water	Medium	Thurrock Council	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Raise community awareness	M4 - Preparedness	Very High	On-going		High
5	**Implement a standardised Asset Register**	Implement a standardised asset register. Educate departments involved in filling in the register Ensure everyone involved understands the register, its purpose and the methodology	ALL	ALL	FWMA / Flood Risk Regs	✔		✔						✔	✔	✔		✔	Thurrock Council	Flood Risk Mgr	Neighbouring authorities		High	Thurrock Council / Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Review asset management and maintenance measures	M6 - Other	Moderate	On-going		Very High
6	**Implement a standardised Asset Register**	Undertake asset surveys. Check outfall conditions to local ditches to check whether they are clear or silted, sufficient size etc Create GIS layer to highlight the location of all assets in the Borough, including areas acting as flood storage areas, and establish ownership/maintenance agreements.	ALL	ALL	Investigation / feasibility / design	✔		✔	✔		✔	✔	✔		✔	✔		✔	Thurrock Council	Flood Risk Mgr / Highways / Transportation	EA, Anglian Water, Highways Agency		High	Thurrock Council / Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Review asset management and maintenance measures	M6 - Other	Moderate	On-going		Very High
7	Improved **maintenance of drainage network**	Information from the asset surveys and register should be used to create a maintenance regime that prioritises key assets and drainage areas within budgets available	ALL	ALL	Investigation / feasibility / design			✔			✔		✔						Thurrock Council	Flood Risk Mgr / Highways / Transportation	Anglian Water, Highways Agency		High	Thurrock Council	£50k-£100k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex						High
8	Ensure **drainage systems are operating at capacity** in AoCD	Review existing gully clearance / maintenance schedules and revise if necessary	ALL	ALL	Investigation / feasibility / design			✔			✔		✔						Thurrock Council	Flood Risk Mgr / Operations / Highways / Transportation	Anglian Water, Highways Agency		Medium	Thurrock Council / Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex						High
9	Implement a **standardised flood incident log**	Revise the incident log as required to incorporate more information. Develop a GIS/web-based database to create a spatial representation of the incidents logged	ALL	ALL	FWMA / Flood Risk Regs	✔				✔		✔			✔	✔			Thurrock Council	Flood Risk Mgr			High	Thurrock Council / Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Improve understanding of local flood risk	M4 - Preparedness	High	On-going		High
10	**Investigate flooding records** and if necessary provide improvements to highways drainage	Documented site visits following flood events. Data sharing with partners	ALL	ALL	FWMA / Flood Risk Regs	✔		✔		✔	✔	✔	✔		✔	✔			Thurrock Council	Flood Risk Mgr / Highways / Transportation		Risk Management Authorities	High	Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Invesitgate local flood issues	M2 - Prevention	High	On-going		Very High
11	**Green roofs/areas**	Investigate opportunities to introduce green roofs/areas as and when sites become available for development	ALL	ALL	Policy		✔	✔			✔	✔	✔						Thurrock Council	Development Control		Developers	Low	Thurrock Council	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		High
12	**Drainage infrastructure improvement:** rural roads	Identify rural roads with no highways drainage and investigate installation of drainage ditches at the roadside to capture runoff	ALL	ALL	Flooding mitigation	✔		✔			✔	✔	✔		✔				Thurrock Council	Flood Risk Mgr / Transport / Highways	Anglian Water		Medium	Thurrock Council	£50k-£100k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		High
13	**Drainage improvements:** planning policy	Use planning policy and advice regarding paving of driveways, using residential soakaways, water butts etc. Develop policy to resist the paving over of driveways	ALL	ALL	Policy		✔	✔			✔	✔	✔		✔				Thurrock Council	Development Control			Medium	Thurrock Council	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		High
14	**Drainage improvements:** preferential flow paths	Identify programme of potential preferential flow path works e.g. contoured grass verges	ALL	ALL	Flooding mitigation			✔			✔		✔						Thurrock Council	Transport / Highways		Anglian Water / Highways Agency	Medium	Defra / Highways Agency	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		High
15	Determine whether **current emergency response** to borough-wide surface water flooding is appropriate	Review the Multi-Agency Flood Plan in the context of the SWMP mapping outputs with key partners including the Highways Agency and Network Rail	ALL	ALL	Investigation / feasibility / design	✔			✔	✔			✔	✔	✔				Thurrock Council	Emergency Planning	Local Resilience Forum	EA / Anglian Water / Highways Agency / Network Rail / Essex Fire and Rescue	Medium	Thurrock Council	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement surface water flood forecasting ans warning systems	M4 - Preparedness	Moderate	Not started - agreed		High
16	Determine whether **services** (e.g. power, telecommunications) **are resilient to surface water flooding.**	Provide outputs from SWMP to critical service providers and meet to discuss the overall resilience of service across the Borough	ALL	ALL	Investigation / feasibility / design	✔				✔			✔		✔	✔			Utility companies	Flood Risk Mgr	Thurrock Council		Medium	Thurrock Council	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement surface water flood forecasting ans warning systems	M4 - Preparedness	Moderate	Not started - agreed		High
17	Look for opportunities to **reduce flood risk to critical infrastructure** whilst upgrading the existing drainage infrastructure.	Review SWMP outputs in relation to critical infrastructure	ALL	ALL	Investigation / feasibility / design	✔		✔			✔		✔		✔	✔			Thurrock Council	Flood Risk Mgr	Utility Companies	Network Rail / electricity provider / asset owner	Medium	Asset owners	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Adaptation of spatial planning to refelct local flood risk	M2 - Prevention	Moderate	Not started - agreed		Very High
AREAS OF CRITICAL DRAINAGE (AoCD) SPECIFIC ACTIONS																																					
18	**A13 drainage capacity**	Highways Agency / Anglian Water to check on pumps and network at A13 to confirm condition. Confirmation of maintenance regime to Thurrock BC.	Aveley & Uplands	AoCD001	Flooding Mitigation	✔		✔			✔		✔		✔				Highways Agency	N/A	Anglian Water, Thurrock Council		Medium	Highways Agency	£1k - £50k	9	4	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex						Low
19	**A13 emergency diversion procedures**	Highways Agency to confirm A13 emergency diversion procedures	Aveley & Uplands	AoCD001	Policy	✔				✔			✔		✔				Highways Agency	Spatial Planning / Emergency Planning	Anglian Water, Thurrock Council		Medium	Highways Agency	£1k - £50k	9	4	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement surface water flood forecasting and warning systems	M4 - Preparedness	Moderate	Not started - agreed		Low
20	**Improvements to drainage infrastructure:** Purfleet Industrial Park / Milehams Yard	Thurrock Council to liaise with RSPB at Aveley Marshes to establish water levels in the marsh. RSPB to show that any changes in levels will have no impact on local surface water regime	Aveley & Uplands	AoCD001	Investigation / feasibility / design	✔		✔			✔	✔	✔		✔				Thurrock Council	Flood Risk Mgr	Highways	Aveley Marshes RSPB, EA, Anglian Water, riparian owners	Medium	Highways Agency	£50k-£100k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going	Being undertaken as part of the Milehams Yard study	High
21	**Improvements to drainage infrastructure:** Purfleet Industrial Park / Milehams Yard	Commission drainage studies to confirm where there are alterations in ground levels which may be causing the local gravity system to fail. Results to be used to confirm a way forward e.g. maintenance of existing system or installation of a new drainage network.	Aveley & Uplands	AoCD001	Investigation / feasibility / design	✔					✔	✔	✔					✔	Thurrock Council	Flood Risk Mgr	Highways	EA, Anglian Water	High	Thurrock Council	£50k-£100k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going	Being undertaken as part of the Milehams Yard study	High

Actions						OBJECTIVES												Action Owners/Partners			Other stakeholders	SWMP Priority	Possible funding sources	Indicative cost	Thames CFMP		South Essex CFMP		TE2100 Plan		Thames RBMP - Identified actions	Thames FRMP					Notes - particularly timing and investment factors	Strategy Priority
						National Objectives					Local Objectives																											
ID	What?	How?	Ward	Area of Critical Drainage	Action Type	N1	N2	N3	N4	N5	L1	L2	L3	L4	L5	L6	L7	L8	Lead Organisation	LLFA Dept	Support					Thames Sub Unit	Policy	South Essex Sub Area	Policy	Action Zone	Policy		Management Catchment	Objective	Measure	Priority	Status		
22	Ensure any development at the Ponds Farm Development provides a **betterment on the existing drainage system.**	Planning policy and information on SuDS	Aveley & Uplands	AoCD001	Policy		✔	✔			✔		✔			✔			Thurrock Council	Flood Risk Mgr	-	Riparian owners	Medium	Developers	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Medium
23	**Emergency plan for AoCD003**	Highways team liaise with Emergency Planning team to ensure that an emergency plan is in place for road closures at this location.	West Thurrock & South Stifford	AoCD003	Investigation / feasibility / design	✔				✔			✔			✔			Thurrock Council	Transport / Highways	Emergency Planning		Medium	Defra	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement surface water flood forecasting and warning systems	M4 - Preparedness	High	On-going		Low
24	**Drainage investigation** at the A126 junction	Thurrock Council to liaise with Anglian Water and Lakeside re the A126 flood risk area. If under capacity, investigate options to install pumps or soakaways to alleviate flood risk	West Thurrock & South Stifford	AoCD003	Investigation / feasibility / design	✔		✔			✔	✔	✔			✔			Thurrock Council	Flood Risk Mgr	Anglian Water, Thurrock Council	Lakeside	Medium	Defra	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Low
25	Ensure any development at Hedley Avenue provides a **betterment on the existing drainage system**	Planning policy and information on SuDS	West Thurrock & South Stifford	AoCD004	Policy		✔	✔			✔		✔			✔			Thurrock Council	Flood Risk Mgr	-	Riparian owners	Medium	Developers	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Low
26	Drainage maintenance: AoCD004	Liaise with Network Rail to review their maintenance programme for drainage ditches in their ownership running alongside the railway line	West Thurrock & South Stifford	AoCD004	Flooding Mitigation	✔					✔					✔			Thurrock Council	Flood Risk Mgr	Network Rail		High	Network Rail	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		High
27	**Drainage investigation:** AoCD004	Liaise with Anglian Water to confirm network capacity within this AoCD. If there is capacity, Thurrock Council to consider adding more gullies to increase the volume of water entering the network during a storm event	West Thurrock & South Stifford	AoCD004	Flooding Mitigation	✔		✔			✔		✔			✔			Thurrock Council	Transport / Highways	Anglian Water		Medium	Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		High
28	**Preferential flow paths:** Hathaway Road	Investigate the use of swales/French drains to attenuate and infiltrate runoff along Hathaway Road and reduce volumes of water ponding behind the rail embankment	Chafford & North Stifford	AoCD005	Flooding Mitigation	✔		✔			✔	✔	✔						Thurrock Council	Flood Risk Mgr	Anglian Water		Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Manage overland flow paths	M3 - Protection	High	On-going		High
29	**Storage Area:** Grays Park	Undertake a detailed drainage study at Grays Park to confirm potential to create preferential flow paths and water storage in the park	Chafford & North Stifford	AoCD005	Flooding Mitigation	✔		✔			✔	✔	✔						Thurrock Council	Flood Risk Mgr	Anglian Water		Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Medium
30	**Capital scheme:** storage area on recreation ground near to Stifford Primary School	Undertaken feasibility study investigate the potential to create a small storage area on recreation ground near to Stifford Primary School to help reduce flows to the south that pool behind the railway embankment.	Chafford & North Stifford	AoCD005	Flooding Mitigation	✔		✔			✔	✔	✔						Thurrock Council	Flood Risk Mgr		Network Rail	Medium	Defra / EA	£50k-£100k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Medium
31	**Preferential maintenance regime:** AoCD005	Implement a preferrential maintenance regime along roads to the west of the AoCD (including Roseberry Road, Castle Road & Belmont Road) to ensure that all flow is entering the drainage channels and not flowing over the road surface	Chafford & North Stifford	AoCD005	Flooding Mitigation			✔			✔		✔						Thurrock Council	Transport / Highways	Anglian Water		Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex						Medium
32	**Drainage maintenance and improvement:** Florence Close	Thurrock Counctil to liaise with Anglian Water to investigate potential to increase capacity of local drainage network in the vicinity of Florence Close by increasing gulley numbers. Need to confirm if there is capacity within the network and preferred approach.	Chafford & North Stifford	AoCD005	Investigation / feasibility / design	✔		✔			✔	✔	✔			✔			Thurrock Council	Transport / Highways	Anglian Water		Medium	Defra	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		Medium
33	**Storage Area:** Hollowfield Avenue	Thurrock Council to investigate potential for storage areas on land located within school playing field and sports ground.	Little Thurrock Rectory	AoCD006	Flooding Mitigation	✔		✔			✔	✔	✔			✔			Thurrock Council	Flood Risk Mgr		School	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		Medium
34	**Improvements to drainage infrastructure:** Hollowfield Avenue	Increase the number of gullies connecting to Anglian Water Drainage network (there is a 1350mm diameter pipe in this location which may have the potential to alleviate flooding	Little Thurrock Rectory Little Thurrock Blackshots Grays Thurrock	AoCD006	Flooding Mitigation	✔		✔			✔	✔	✔			✔			Thurrock Council	Transport / Highways	Anglian Water		High	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		High
35	**Preferential flow paths:** Balfour Road / Whitehall Road	Creation of preferential flow paths to control overland flow	Little Thurrock Rectory Little Thurrock Blackshots Grays Thurrock	AoCD006	Flooding Mitigation			✔			✔		✔						Thurrock Council	Flood Risk Mgr			Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Manage overland flow paths	M3 - Protection	High	On-going		Medium
36	**Drainage infrastructure improvement:** AoCD007	Thurrock Council to liaise with Anglian Water to investigate possibilities of connection to 1500mm diameter pipe to alleviate standing water problems	Tilbury Riverside & Thurrock Park	AoCD007	Investigation / feasibility / design	✔		✔			✔	✔	✔			✔			Thurrock Council	Transport / Highways	Environment Agency / Anglian Water	Local landowners	High	Defra / EA	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		Medium
37	**Confirm and map ownership and maintenance and identify 'mis-connections'** to the highway drainage	Reference to Council records, liaison with Environment Agency, Anglian Water and landowners Process will be used to obtain information and potentially enforce maintenance of drainage assets	Tilbury Riverside & Thurrock Park	AoCD007		✔		✔			✔	✔				✔			Thurrock Council	Transport / Highways	Environment Agency / Anglian Water	Local landowners	High	Defra / EA	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		Medium
38	**Improvements to drainage infrastructure:** AoCD008	Undertake assessment of drainage infrastructure outfalling to local drainage ditches. If there is not sufficient capacity within the system the potential for on-line attenuation prior to outfall into the watercourses should be investigated.	Tilbury St Chads East Tilbury Chadwell St Marys Little Thurrock Rectory	AoCD008	Investigation / feasibility / design	✔		✔			✔	✔							Thurrock Council	Flood Risk Mgr	Environment Agency / Anglian Water	Local landowners	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		High
39	**Improvements to drainage infrastructure:** AoCD008	Thurrock Council to provide support to residents through creation of preferential flow paths or property level protection where local ground levels have altered and changed the flow regime	Tilbury St Chads East Tilbury Chadwell St Marys Little Thurrock Rectory	AoCD008	Investigation / feasibility / design	✔			✔	✔			✔		✔				Thurrock Council	Flood Risk Mgr	Environment Agency / Anglian Water	Local landowners	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex						Medium
40	**Network rail culverts:** AoCD008	Liaise with Network Rail to ensure culverts are appropriately sized and are being maintained	Tilbury St Chads East Tilbury Chadwell St Marys Little Thurrock Rectory	AoCD008	Investigation / feasibility / design	✔		✔			✔	✔	✔			✔			Thurrock Council	Flood Risk Mgr		Network Rail	Medium	Network Rail	£1k - £50k	n/a	n/a	5	4	5	4	South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		High
41	**Anglian Water adoption of foul and surface water sewer network** in this AoCD	Thurrock Council and Anglian Water to meet to discuss adoption of both foul and surface water sewer network in this AoCD. Ensure a separate surface water and foul water system is provided as part of any new development and is adopted by Anglian Water	East Tilbury	AoCD009	Policy	✔		✔			✔	✔	✔			✔			Thurrock Council	Transport / Highways	Anglian Water		High	Defra / EA	£1k - £50k	n/a	n/a	5	4	6	3	South West Essex Catchment - no key actions identified	South Essex						Medium
42	**Asset survey of surface water ditch:** AoCD010	Surface water ditch in the south eastern corner of East Tilbury contains all of the town's surface water drainage; ownership and maintenance responsibilities are unknown. If ownership cannot be confirms, Thurrock Council to consider adopting this network	East Tilbury	AoCD009	Policy	✔		✔			✔	✔	✔						Thurrock Council	Flood Risk Mgr	Anglian Water	Developers	High	Defra / EA / Developers	£1k - £50k	n/a	n/a	5	4	6	3	South West Essex Catchment - no key actions identified	South Essex						Medium
43	**Source control SuDS**: north A13	Investigate potential for detention basin on farmland to the north of the A13	Orsett	AoCD010a	Flooding Mitigation	✔		✔			✔	✔	✔						Thurrock Council	Flood Risk Mgr		Local landowners	Low		£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going	TBC confirmed through modelling for Stanford le Hope FSA	Medium
44	**Surface water network capacity improvements:** AoCD010b	Ensure new development in AoCD11b invests in the local surface water network which is currently at capacity	Stanford-le-Hope West Orsett	AoCD010b	Policy		✔				✔				✔				Thurrock Council	Spatial Planning / Development Control	Anglian Water		Medium	Developer contributions / Anglian Water	£50k-£100k	n/a	n/a	5	4	6	3	South West Essex Catchment - no key actions identified	South Essex						Medium
45	**Asset survey and maintenance responsibilities:** Prospect and Valmar Avenues	Liaise and educate residents of Prospect and Valmar Avenue regarding their riparian responsibilites regarding the culvert/ditch to the rear of their properties	Stanford-le-Hope West	AoCD010b	Communication / Partnerships	✔		✔	✔		✔		✔			✔			Thurrock Council	Flood Risk Mgr	Environment Agency	EA / Defra / local lanowners	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4	6	3	South West Essex Catchment - no key actions identified	South Essex	Raise community awwareness	M4 - Preparedness	Very High	On-going	Being addressed by diversion into new development	Medium
46	Improvements to drainage infrstructure: **Runnymeade Road recreation ground**	Identify recreation ground as a surface water flood storage area in asset register. Complete condition survey of the outfall from the recreation ground and confirm how it reconnects to the Stanford Brook. Undertake any required remedial action.	Stanford-le-Hope West	AoCD010b	Investigation / feasibility / design			✔			✔	✔	✔					✔	Thurrock Council	Flood Risk Mgr	Environment Agency	Local landowners	High	Defra / EA	£1k - £50k	n/a	n/a	5	4	6	3	South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		High
47	**Asset register:** open land in Stanford-le-Hope	Open land in Stanford-le-Hope and Runnymeade recreation ground act as flood storage areas; these should be identified as such in the asset register and highlighted to development control teams. Any development in these areas would require level for level floodplain compensation.	Stanford-le-Hope West Orsett	AoCD010b	Communication / Partnerships		✔	✔			✔		✔						Thurrock Council	Flood Risk Mgr	Environment Agency	Local landowners	High	Defra / EA	£1k - £50k	n/a	n/a	5	4	6	3	South West Essex Catchment - no key actions identified	South Essex	Review asset management and maintenance methods	M6 - Other	Moderate	On-going	Part of Stanford le Hop FAS	Medium

Actions						OBJECTIVES													Action Owners/Partners			Other stakeholders	SWMP Priority	Possible funding sources	Indicative cost	Thames CFMP		South Essex CFMP		TE2100 Plan		Thames RBMP - Identified actions	Thames FRMP						Notes - particularly timing and investment factors	Strategy Priority
						National Objectives					Local Objectives																													
ID	What?	How?	Ward	Area of Critical Drainage	Action Type	N1	N2	N3	N4	N5	L1	L2	L3	L4	L5	L6	L7	L8	Lead Organisation	LLFA Dept	Support					Thames Sub Unit	Policy	South Essex Sub Area	Policy	Action Zone	Policy		Management Catchment	Objective	Measure	Priority	Status			
48	**Improvements to drainage maintenance:** Victoria Road Brook	Confirm with EA the maintenance regime for Victoria Road Brook. If low priority, work with local community to help maintain the brook	Stanford-le-Hope West	AoCD010c	Flooding Mitigation	✔		✔	✔		✔		✔		✔				Thurrock Council	Flood Risk Mgr	Environment Agency		Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	On-going		Medium
49	**Improvements to drainage infrastructure:** Southend Road	Introduction of extra gully connections to the Anglian water system along Southend Road, to reduce pooling at the Bypass Junction at Manorway	The Homesteads Stanford East & Corringham Town	AoCD010d	Flooding Mitigation	✔		✔			✔	✔	✔			✔			Thurrock Council	Transport / Highways	Anglian Water		High	Defra / EA / Thurrock Council	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going	to be provided as part of Southend Rd development if given permission	
50	**Source control SuDS:** Southend Road	Undertake drainage survey where Southend Road crosses the Manorway, investigating the potential to provide a detention basin in existing green spaces	The Homesteads Stanford East & Corringham Town	AoCD010d	Investigation / feasibility / design	✔		✔			✔	✔	✔						Thurrock Council	Transport / Highways	Environment Agency	Anglian Water	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Medium
51	**Emergency planning:** Southend Road	Ensure an emergency plan and traffic management plan is in place for Southend Road underpass during flood events.	The Homesteads Stanford East & Corringham Town	AoCD010d	Flooding Mitigation					✔			✔			✔			Thurrock Council	Transport / Highways	Environment Agency	Anglian Water	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement surface water flood forecasting and warning systems	M4 - Preparedness	Moderate	Not started - agreed		Low
52	**South control SuDS:** A13 / railway	Investigate two flow paths from farmland in the north and northeast of the AoCD to determine the effects of providing storage in the north of the catchment.	Orsett	AoCD010d	Investigation / feasibility / design	✔		✔			✔	✔	✔					✔	Thurrock Council	Flood Risk Mgr	Environment Agency	Anglian Water	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Manage overland flow paths	M3 - Protection	High	On-going	Part of Stanford le Hop FAS	High
53	**Source control SuDS:** Hassen Brook	Feasibility study into the potential creation of a storage area between the A13 and railway line with a flow control limiting surface water flow entering the Hassen Brook from the north of the catchment	The Homesteads Corringham & Fobbing	AoCD010d	Investigation / feasibility / design	✔		✔			✔	✔	✔				✔	✔	Thurrock Council	Flood Risk Mgr	Environment Agency	Anglian Water	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going	Part of Stanford le Hop FAS	High
54	**Improvements to drainage infrastructure:** Bramleys and Russet Close	Provision of extra gullies along Bramleys and Russet Close to Anglian Water System. Investigate the impact this would have on flooding in the Dunstable Road area	The Homesteads	AoCD010d	Flooding Mitigation	✔		✔			✔	✔	✔			✔			Thurrock Council	Transport / Highways	Anglian Water	Environment Agency	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Medium
55	**Flood storage:** Balsonia Recreation Gardens	Investigate potential for flood storage in Balsonia Recreation Gardens to reduce the impact of flooding on Bramley.	The Homesteads	AoCD010d	Investigation / feasibility / design	✔		✔			✔	✔	✔				✔		Thurrock Council	Flood Risk Mgr	Anglian Water	Environment Agency	Medium	Defra / EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		High
56	**Improvements to drainage infrstructure:** AoCD011	Investigate 'misconnections' and educate homeowners on responsibilities regarding property drainage	Bulphan	AoCD011	Flooding Mitigation			✔	✔			✔			✔				Thurrock Council	Flood Risk Mgr	Anglian Water	Environment Agency	High	Thurrock Council / Anglian Water	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Raise community awwareness	M4 - Preparedness	Very High	On-going		Medium
57	**Improvements to drainage infrastructure:** main river alleviation schemes	Liaise with EA regarding need and opportunities for flood defence schemes on Main Rivers located across the AoCD	Bulphan	AoCD011	Investigation / feasibility / design	✔		✔			✔	✔				✔			Thurrock Council	Flood Risk Mgr	Environment Agency		High	EA	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex						Medium
58	**Planning Policies:** Ford site	Control development at the Ford site by ensuring developers provide a new separate drainage system. The current surface water system rejoins a combined system which has insufficient capacity.	Ockendon Belhus	AoCD013	Policy		✔	✔			✔		✔		✔				Thurrock Council	Development Control	Anglian Water		Medium	Developer contributions	£50k-£100k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Achieve wider environmental benefits	M6 - Other	High	On-going		Low
59	**Improvements to drainage infrastructure:** Buckles Lane	Thurrock Council to consider adopting highway drainage from Buckles Lane, and reinstate and maintain drainage ditches.	Belhus	AoCD013	Flooding Mitigation			✔			✔		✔						Thurrock Council	Transport / Highways	Anglian Water		Medium	Defra / EA	£50k-£100k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Implement SuDS and source control measures	M3 - Protection	High	On-going		Low
60	**Improvement to drainage capacity:** AoCD014	Investigate drainage capacity due to increased pressure from future development in this area. Where there is limited capacity, development policy should ensure development invests in the surface water drainage network	Aveley & Uplands	AoCD014	Policy		✔	✔				✔			✔				Thurrock Council	Development Control	Anglian Water		Medium	Developer contributions / Anglian Water	£1k - £50k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	Ongoing		Medium
61	**Improvements to drainage infrastructure:** AoCD014	Thurrock Council to undertake asset survey and consider adopting maintenance of ditches that fall into 'no-man's land' to ensure future maintenance responsibilities	Aveley & Uplands	AoCD014	Flooding Mitigation	✔		✔			✔	✔							Thurrock Council	Flood Risk Mgr			Medium	Defra / EA	£50k-£100k	n/a	n/a	5	4			South West Essex Catchment - no key actions identified	South Essex	Investigate local flood issues	M2 - Prevention	High	Ongoing		Medium

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