SECTION 19 FLOOD AND WATER MANAGEMENT ACT

FLOOD INVESTIGATION REPORT

QUEBEC ROAD, TILBURY

NOVEMBER 2013

EXECUTIVE SUMMARY

In its capacity as Lead Local Flood Authority, Thurrock Council has undertaken a formal s19 Flood Investigation in response to the flooding of properties on Quebec Road on numerous occasions in 2012/13.

This investigation identified surface water as the main source of flooding as the local drainage system surcharged. A number of factors are causing the flooding including a blocked surface water sewer outfall resulting from a silted up section of main river watercourse as well as the impaired condition and capacity of the sewerage network.

The risk management authorities with responsibilities relating to these flood events are Anglian Water, Environment Agency, Port of Tilbury as landowner and Thurrock Council as lead local flood authority and local Highway Authority. All these RMAs have functions to exercise relating to the flooding and through this investigation recommendations were identified for how improvements can be made to mitigate future flooding.

Short term measures are due to be implemented to ensure the drainage system is working effectively such as desilting of the East Dock Sewer and cleansing the sewer networks. These measures are to be complemented with more long term actions including clarifying riparian responsibilities, introducing a maintenance schedule, and pooling of flood modelling information to identify potential long term solutions to reduce flood risk in the area.

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RECOMMENDATIONS

Recommendation 1	*Due By: January 2014*
Determine ownership and maintenance responsibility for Ferry Road retaining wall.	
Responsibility:	***Port of Tilbury, Environment Agency, Thurrock Council Highways***

Recommendation 2	*Due By: COMPLETE*
Undertake short-term maintenance works to East Dock Sewer to remove silt build up downstream of AW sewer outfall.	
Responsibility:	***Environment Agency, Port of Tilbury***

Recommendation 3	*Due By: June 2014*
Determine ownership and future maintenance regime and responsibilities for East Dock Sewer.	
Responsibility:	***Port of Tilbury, Environment Agency, Thurrock Council LLFA/Highways***

Recommendation 4	*Due By: 29 November 2014*
Undertake cleanse and condition survey of sewer network on Quebec Road in coordination with EA.	
Responsibility:	***Anglian Water***

Recommendation 5	*Due By: June 2014*
Carry out hydrological modelling of Quebec Road sewer network in combination with EA Main river model and Thurrock Council surface water mapping to determine capacity of drainage system in Quebec Road area. Identify options to reduce flood risk and formulate and submit funding applications as appropriate.	
Responsibility:	***Anglian Water, Environment Agency, Thurrock Council LLFA***

INTRODUCTION

Thurrock Council as the Lead Local Flood Authority (LLFA) has a duty under Section 19 of the Flood and Water Management Act (FWMA) to investigate significant flood incidents in its area. Section 19 states:

(1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate:

a) Which risk management authorities have relevant flood risk management functions, and

b) Whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.

(2) Where an authority carries out an investigation under subsection (1) it must:

a) Publish the results of its investigation, and

b) Notify any relevant risk management authorities.

LOCATION

This investigation concerns the Quebec Road area of Tilbury as shown in Figure 1, grid reference TQ 64233, 76457.

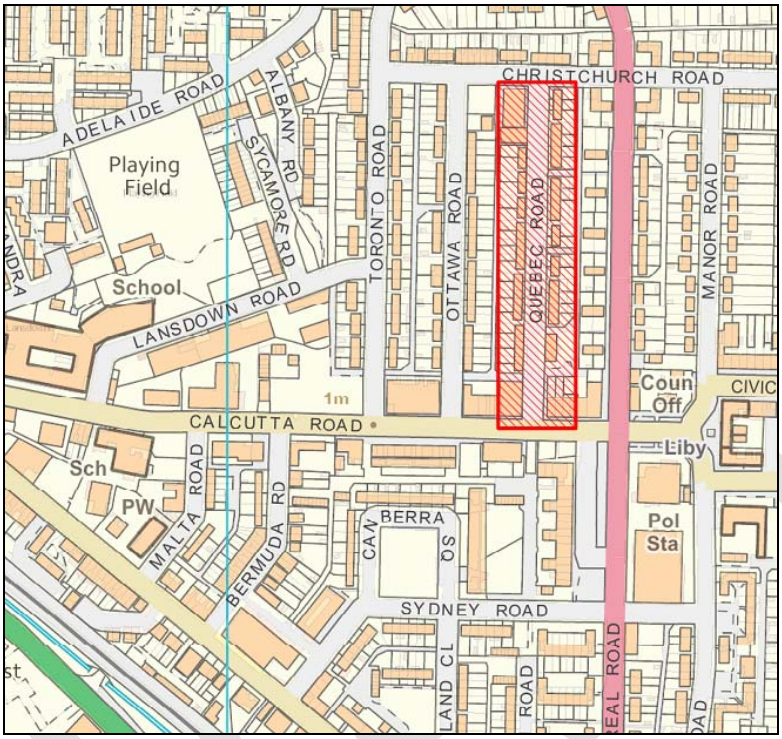

FIGURE 1: LOCATION PLAN, QUEBEC ROAD, TILBURY

RESPONSIBILITIES

Thurrock Council

Thurrock Council is the Lead Local Flood Authority for its area with responsibility for leading on the management of local flood risk, principally meaning surface runoff, groundwater and ordinary watercourses. The authority has a crucial role in identifying and responding to the needs of the community and working in partnership with a range of public and private organisations and agencies to coordinate flood response. The Council also has responsibilities as highway authority, local planning authority, riparian owner and emergency planning functions.

The Environment Agency

The Environment Agency (EA) has a strategic overview role for flood and coastal erosion risk management in addition to permissive powers for delivery of flood risk management activities on Main Rivers.

Anglian Water

Anglian Water is the risk management authority responsible for the provision, improvement and maintenance of the public sewerage system.

Riparian Responsibilities

Owners of land adjoining, above or with a watercourse running through it have certain rights and responsibilities and in legal terms are termed 'riparian owners'[1]. In short, riparian owners must let water flow through their land without obstruction, must accept flood flows and maintain watercourse bed and banks removing any obstruction that could increase flood risk downstream.

FLOOD RISK

The area under investigation is situated in EA tidal flood zone 3 (see Figure 1), representing land with a 1 in 200 years (0.5%) chance of flooding from tidal sources in any one year, as shown in figure 2.

FIGURE 2: FLOOD RISK MAP

Surface Water Flood Risk

According to the EA Flood Map for Surface Water, the northern part of Quebec Road is at risk of flooding in the 1 in 30 year event. This is consistent

[1] More information on riparian rights and responsibilities is available on the EA website at: http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT_7114_c70612.pdf

with observations on site and Light Detection and Ranging (LiDAR) data indicating that this area is at the base of a natural depression.

Flooding History

Anecdotal evidence from local residents, local press articles as well as details provided by Thurrock Council Housing Services[2] indicates that several properties on Quebec Road have flooded on a number of occasions over the last 10 years, namely September 93, July 94, December 94, March 96, April 98, June 02, September 02, June 03, August 11, November 11, January 12, April 12, June 12 and September 12.

However, in recent times the frequency of these events has increased with reports recorded by Anglian Water and the Environment Agency highlighting nine incidents to date in 2013. The properties on the west side of the road have been flooded internally, whilst on the east side it has only been externally, but seemingly on a more frequent basis.

Drainage Network

Quebec Road is served by a separate surface water and foul sewer network. Review of the Anglian Water asset database indicates that a 375mm sewer runs north to south along Quebec Road, continuing to its outfall into East Dock Sewer (an EA designated 'Main' river[3]). A land registry search indicates that the Port Of Tilbury (PoT) own the land at the outfall and therefore have responsibilities as riparian owners. As a designated Main river the EA have permissive powers to deliver flood risk management activities on it.

Flooding Mechanism

From discussions and correspondence received from residents, the mechanism of flooding is summarised as follows. Flooding occurs shortly after the onset of moderate rainfall. Initially the water drains away, but very quickly the drainage system reaches capacity and the surface water drains on Quebec Road surcharge. This results in water flooding the road as highway gullies are unable to drain away, leading to property flooding when the water level rises above kerb height. This problem is compounded by individual properties' surface drains becoming full and roof drainage down pipes being unable to discharge, resulting in water flooding the outsides of properties and in more intense rainfall rising above thresholds and flooding internally too. A problem exacerbated by the low threshold levels of properties on Quebec

[2] Data interpreted from housing repairs report dated 17th September 2013, therefore the date of flooding events could be sometime before repairs are ordered.

[3] Main River Definition - Main river means all watercourses shown as such on the statutory main river maps held by the Environment Agency and the Department of Environment, Food and Rural Affairs, and can include any structure or appliance for controlling or regulating the flow of water into, in or out of the channel.

Road, being below road level and with gardens sloping towards the properties. Within a number of hours after the rainfall ends, the water drains away either directly into the ground or suspected through interactions with the foul sewerage system.

INVESTIGATION

In December 2012 representatives from Thurrock Council Highways, the Environment Agency and PoT undertook a joint site visit regarding the condition of the Ferry Road retaining wall. At this meeting initial discussions were held regarding the wider maintenance issue of East Dock Sewer as it was apparent that it was highly vegetated (see Figure 3) and demonstrating limited flow.

FIGURE 3: EAST DOCK SEWER, OVERGROWN VEGETATION

Discussions with the PoT and Thurrock Highways about ownership and maintenance responsibility for the Ferry Road retaining wall ensued; vegetation clearance and desiliting works hinged on responsibility for this section of the East Dock Sewer. Its condition impacted on the viability of undertaking works to the watercourse with concerns regarding its structural integrity.

Recommendation 1	***Due By: January 2014***
Determine ownership and maintenance responsibility for Ferry Road retaining wall.	
Responsibility:	***Port of Tilbury, Environment Agency, Thurrock Council Highways***

After further flooding in February, March and April the EA resolved to undertake vegetation clearance works (see Figure 4) in an attempt to remove any blockages to flow and to also undertake a topographic survey to determine bed levels.

FIGURE 4: EAST DOCK SEWER AFTER VEGETATION CLEARANCE

A meeting followed on the 19th June 2013 between the EA and AW to discuss the Quebec Road flooding. On review of the survey results it was discovered that there was a localised high silt level around the outfall of the AW sewer.

It appears that the surcharging of the sewerage system was being caused at least in part by the restricted outfall into the East Dock Sewer, resulting in water backing up into the surface water sewer and flooding properties. It was therefore proposed that localised desilting be undertaken around the outfall to enable discharge from the sewer. It was determined that the scope of these works were outside of the Ferry Road retaining wall and therefore could be undertaken without risk to that structure.

Site inspection highlighted that the AW surface water sewer (SWS) outfall lacked a non return valve. Therefore in times of high water levels in the river the SWS has potential for surcharging. However, observations on site also indicated the presence of fixings from a redundant control structure which may need further investigation to determine ownership and explanation for its removal.

In response to the findings from the topographic survey the EA has chosen to use its permissive powers to undertake the works to remove the silt build up by the outfall structure on East Dock Sewer. In order to do this, they informed the PoT as landowners in June and sought their agreement for disposal of the arisings on their land.

Recommendation 2	***Due By: COMPLETE***
Undertake short-term maintenance works to East Dock Sewer to remove silt build up downstream of AW sewer outfall.	
Responsibility:	***Environment Agency, Port of Tilbury***

In order to minimise the potential for future delays and contention about responsibility for maintenance of the East Dock Sewer, dialogue is required between the associated authorities to inform the signing of a memorandum of understanding for future maintenance. It is proposed that a meeting be set up between the responsible authorities so that agreement can be sought in order

to reduce the potential for future flooding and to benefit the residents of Quebec Road.

Recommendation 3	***Due By: June 2014***
Determine ownership and future maintenance regime and responsibilities for East Dock Sewer.	
Responsibility:	***Port of Tilbury, Environment Agency, Thurrock Council LLFA/Highways***

In addition to the limited discharge into the East Dock sewer, it is alleged that the sewerage network may be suffering from localised blockages and in need of maintenance, suggested by the presence of standing water in the pipes and drains even after prolonged periods without rainfall. It is therefore essential that AW, Thurrock Highways and Housing undertake a condition survey of their assets and fully cleanse their system in coordination with the EA, ensuring any blockages do not get flushed through to the East Dock Sewer.

Recommendation 4	***Due By: 29th November 2013***
Undertake cleanse and condition survey of sewer network on Quebec Road in coordination with EA.	
Responsibility:	***Anglian Water***

Work was undertaken between the Environment Agency and Anglian Water in 2003 to model the flow characteristics of the East Dock Sewer under theoretical flood scenarios. This study highlighted that *"the last three lengths of 375 dia. sewer are under-capacity, and upsizing these would result in less surcharging of the remainder of the system", i*ndicating that the sewerage network is undersized and may be a key element in further reducing future flood risk. This result is substantiated by the Thurrock Surface Water Management Plan (SWMP) which indicates that the area has the propensity to flood in extreme rainfall events. Further investigation and modelling in this area is required to determine the capacity of the AW drainage system and how this interacts with the wider drainage network. This combined modelling should determine what options are available to either reduce surface runoff into the sewer or increase its capacity to reduce flood risk in this area, potentially ranging from improvements to the sewer networks, exploring opportunities for retrofitting sustainable drainage systems to introduction of property level protection dependent on their viability in terms of cost and benefit.

Recommendation 5	***Due By: June 2014***
Carry out hydrological modelling of Quebec Road sewer network in combination with EA Main river model and Thurrock Council surface water mapping to determine capacity of drainage system in Quebec Road area. Identify options to reduce flood risk and formulate and submit funding applications as appropriate.	
Responsibility:	***Anglian Water, Environment Agency, Thurrock Council LLFA***

CONCLUSION

The frequent and significant flooding of properties on Quebec Road, Tilbury initiated this formal s19 Flood Investigation. This report documents the difficulty in determining the boundaries in authorities' responsibilities when it comes to the management of surface water drainage and flooding response. Through a partnership approach it has been possible to agree shorter and longer term solutions to the flooding on Quebec Road to bring some much needed relief to residents.

Future progress against the recommendations will be monitored by Thurrock Council in its capacity as Lead Local Flood Authority. The authority's Overview and Scrutiny committee has powers to call in any risk management authority to evidence their progress against actions and may do so at anytime in the future.