2012

Kirklees Council
Flood Investigation
6 Enfield Close, Batley

Flood Management and Drainage Team

Kirklees Council

1/23/2012

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Executive Summary

Kirklees Council, as a Lead Local Flood Authority (LLFA), has a responsibility under Section 19 of the Flood and Water Management Act 2010 to investigate significant flood incidents in its area. The LLFA must investigate the incident and determine which risk management authorities have relevant flood management functions and whether those functions have been exercised. It must publish the results of its investigation and notify any relevant risk management authorities.

The flood incident at 6 Enfield Close involved internal flooding (to a basement kitchen) and is therefore regarded by the Council as a **significant** flood event, meriting an investigation under Section 19 of the Act.

Flooding occurred to the basement of 6 Enfield Close during 3-5 January 2012. The flooding followed a sustained period of rainfall, resulting in saturated ground conditions across the district. The floodwater entered the property from a disused coal store, adjacent to the flight of steps serving the basement, from a point source in the wall of the coal store approx 2m below ground level.

Investigations were carried out by Kirklees Council private drainage team, Yorkshire Water, Kirklees Council highways department and Kirklees Council flood management team. This report was prepared by the flood management team in its role as Lead Local Flood Authority.

A variety of investigations of known drainage assets were carried out and an assessment of historical data made to determine all possible causes of the flooding.

Following a thorough investigation it was not possible to identify a positive source or cause for the floodwater. Assessment of the available evidence implies that no known drainage system in the area contributed to the flooding. It is presumed that the floodwater came from a groundwater source probably resulting from raised groundwater levels arising from recent heavy rainfall.

1. Introduction

Kirklees Council, as the Lead Local Flood Authority (LLFA), has a responsibility under Section 19 of the Flood and Water Management Act 2010 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

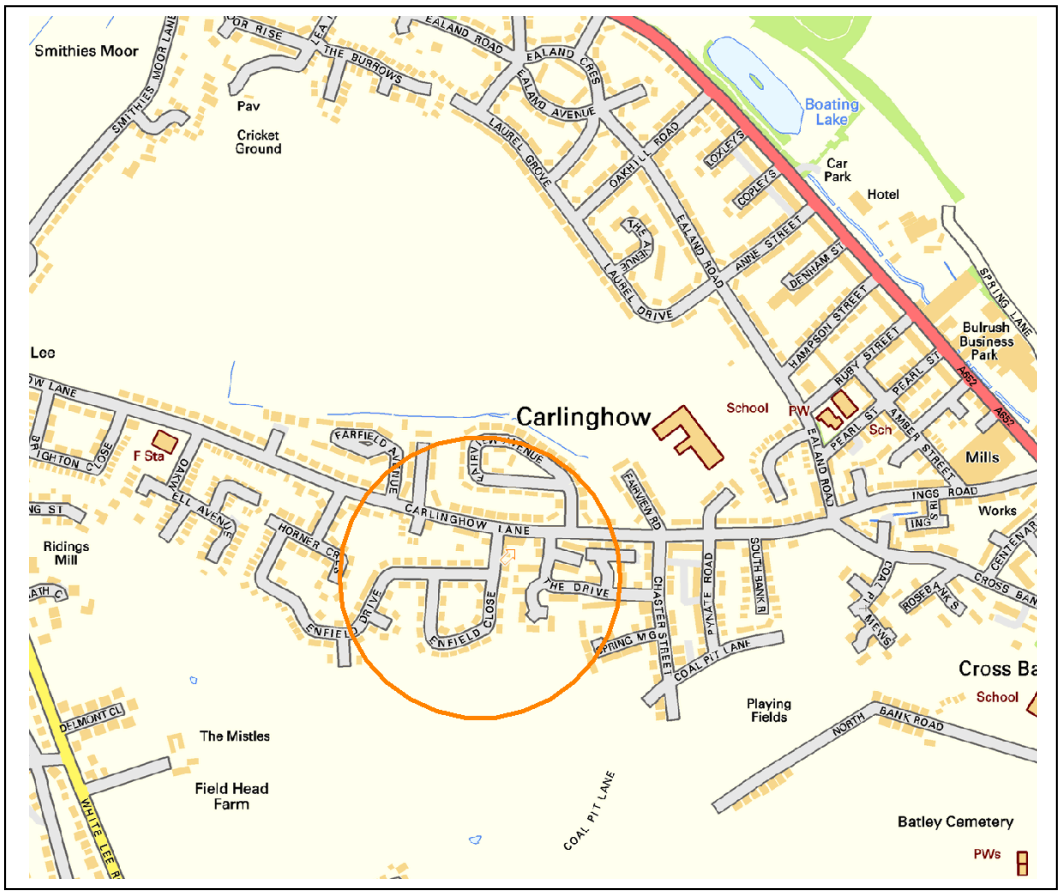
(b) notify any relevant risk management authorities.

The council, as LLFA, considers a **significant** flood to be –

- Where one or more residential or business properties suffer internal flooding
- Where there is a risk to life as a result of the depth and/or velocity of floodwater
- Where critical infrastructure (eg emergency services buildings, utility company infrastructure, schools, day centres, hospitals and main transport routes) suffer flooding or obstruction, or were in imminent danger of flooding
- Where 5 properties or more were in imminent danger of flooding
- Where local democratic pressures from elected members, committees, or other elected bodies, might be considered as a factor in determining whether a formal investigation should be carried out

If a local flood occurs which is classed as significant, a formal investigation will be carried out in accordance with Section 19 of the FWMA. The council will use its best endeavours to complete the investigation and report the results within 6 weeks of the date of the flood. The report will be published on the council's website, copies delivered to those authorities deemed responsible for further action in relation to the flooding and copies delivered to those residents and businesses who suffered flooding.

2. Location of Flooding



6 Enfield Close (Box's Buildings) is a late 19th century property in a complex of back to back properties at the junction of Enfield Close and Carlinghow Lane, Batley.

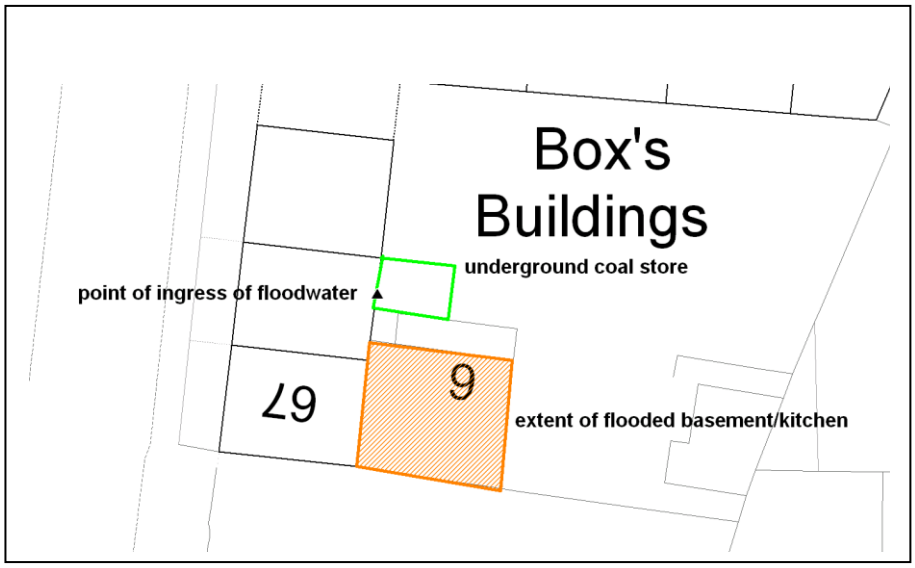
3. The Flood Incident

Flooding occurred to the basement of 6 Enfield Close, one of a block of late 19th century properties, on 4 January 2012. The basement to the property is used as a kitchen, accessed externally from a flight of steps. The floor in the kitchen is approximately 2m below the external ground level in the courtyard to the block of properties. It appears that the source of the floodwater was from an unused underground coal store adjacent to the foot of the steps with a ground level similar to the basement level. Water was observed by the resident to be issuing from a side wall in the store at a rapid rate, entering the basement area and filling it to a depth of 75mm before receding. The resident had to use two small pumps to minimise the amount of flooding but the depth only reduced as the flow into the cellar reduced. Flooring, kitchen units and several white appliances were destroyed from the event. Neighbouring properties have similar basements with similar floor levels, many used as habitable rooms. It appears that 4 Enfield Close reported water entering the basement but there have been no reports of flooding to the other properties.

Whilst, understandably, the resident was distressed at the speed and severity of the flooding, it does not appear that there was a risk to life as a result of depth or speed of flow of water.

The flooding followed a sustained period of steady rainfall. Open ground was saturated and there were several reports of overland surface water flows across the district. There has also been an increase in the number of reports of "wet" cellars during the same period.

The flooding was not witnessed by the Flood Management team. The initial attendance at the site was from the Councils Private Drainage team. A record of their findings is included in Section 6. Subsequent visits to the site have also been made by Yorkshire Water and the Council's Flood Management team and their findings are included in Section 6.



Location and Extent of Flooding

4. Risk Management Authorities to be Consulted

The following authorities are considered to have relevant responsibilities in the vicinity of the flooded properties and have been consulted during the preparation of this report.

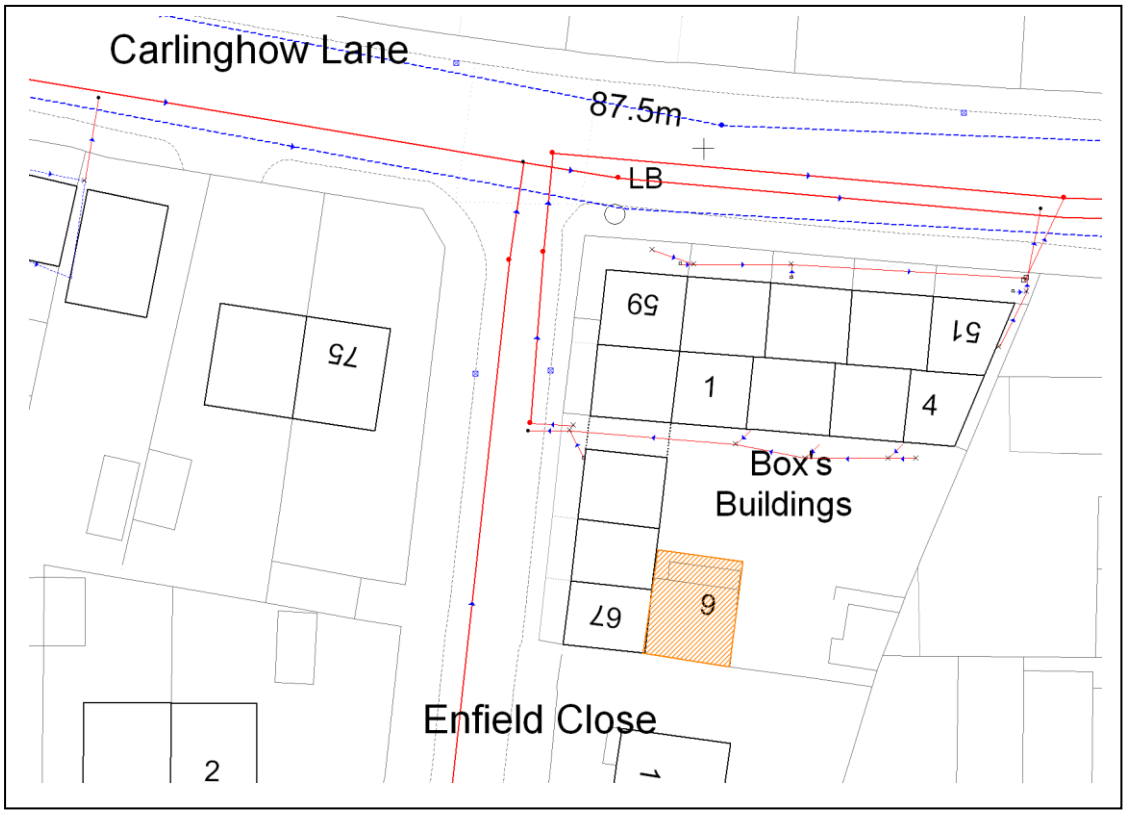
Lead Local Flood Authority (Kirklees Council)

Water and Sewerage Company (Yorkshire Water)

The Highway Authority (Kirklees Council)

It is not considered that the Environment Agency has any responsibility for the cause or resolution of the flooding.

5. The Drainage System



Description of Drainage Systems in the vicinity

Yorkshire Water Drainage Systems – The plan above shows the recorded extent of the public sewer network in the area. The thin red lines near the properties indicate the drainage serving the individual properties (Known as "Section 24" drainage). The thicker red lines are the main combined (foul and surface water) public sewers. The dotted blue lines are surface water public sewers.

The surface water sewer nearest to Box's buildings is an old square section stone slab culvert dating back to pre 1850. It may well be related to the previous site features (well and mill) referred to in the **Unrecorded Drainage Systems** referred to below.

Kirklees Council Drainage – The Council is responsible for the road gullies in the public highway (indicated with small blue squares on the plan) and their piped connections to the public sewer system. The Council has no records of separate highway carrier drains or culverted watercourses in the vicinity.

Private Drainage – The age of the properties means that YW accept that the shared drainage system around the properties is owned and maintainable by YW. Connections from individual properties to the shared drainage remain the responsibility of the individual owners. These single property connections are generally unrecorded and are not shown on the plan.

Unrecorded Drainage Systems – Examination of old ordnance survey maps back to 1854 doesn't show any obvious evidence of culverted watercourses that may be unrecorded. The 1854 map shows a well on the piece of land occupied by Box's buildings. The land immediately to the east was

occupied by a woollen mill (Spring Mill) with some evidence of a mill pond on the site. It may be that the well was spring-fed or possibly that it was fed by a culverted watercourse which in turn fed the mill pond further downstream. It may be that this culverted watercourse still exists under Box's buildings but the circumstantial evidence is weak and extremely difficult to confirm.

6. Recent Flood History

Location of Council recorded flood incidents near to 6 Enfield Close

Incident 1 – Blocked road gully on Carlinghow Lane, Aug 1999

Incident 2 – Flooded cellar, June 2008

The resident at 6 Enfield Close has indicated that there have been a number of recent incidents where water has threatened the basement room, coinciding with the recent housing development site to the rear of his property (Greenfield View). The Council has no record of these incidents.

In summary, there is little recorded history of flooding in the area, either to properties or overland surface flooding.

7. Investigations Carried out

7.1. Attendance by Private Drainage Team, Kirklees Council

Investigation carried out on **4 January**. Water entering the foot of the external stairwell but not entering the basement kitchen. Drainage systems serving the block of houses dye-tested. Floodwater appears to be clear with no odour.

Returned on **5 January** to check dye-test. No dye observed by resident in basement but volume of water drastically increased. Clean water gushing from coal store and up through flags at base of stairs, under force. No 4 Enfield Crescent reporting water in their basement. 2 pumps employed to manage levels, pumping into kitchen sink. Sink dye-tested and no dye re-emerging in floodwater proving no defect/issue on the "Section 24" drainage or Yorkshire Water combined sewers. Problem referred to Flood Management team to investigate surface water/groundwater issues. Amount and pressure of floodwater may indicate a freshwater leak/burst from water main/service pipe – also referred to YW to check.

Returned on **9 January** to check the Surface Water culvert in the footway adjacent to Box's buildings (Joint inspection with YW). Culvert was dye-tested upstream but the dye was not observed in the downstream manhole, indicating a possible obstruction in the culvert. YW to arrange a CCTV survey of the surface water culvert.

7.2.Yorkshire Water

Following contact from the resident Yorkshire Water's service partners attended site on **3rd January 2012**. The property was found to have water in the kitchen, which is situated in the cellar, below street level. Our representative confirms that the water was odourless and colourless. In line with our procedures a dye test was carried out which confirmed that the water was not coming into the property from the public sewers in the immediate area.

A Yorkshire Water representative also visited the location on **6 January 2012** following a second call from the resident reporting that water was again entering the property. During this inspection dye tests were carried out on the gullies surrounding the property that proved the water was not entering the property from the gully system. A CCTV inspection was made of the public sewer running from the property to a distance of 28 meters downstream.
We can confirm that this survey shows the sewer as having no visible defects and that it is operating normally.

An additional CCTV survey was carried out on 11 January over a greater distance, this survey did detect a restriction in the sewer 60 meters downstream of the property and work has been raised to remove this partial blockage. It is our finding that the restriction identified was not connected with the flooding event on 3 January as the sewer immediately outside the property and to a distance of 28 meters was operating normally and not surcharged. This finding is supported by the fact that no other properties, nearer the restriction, have reported any flooding issues.

A final CCTV survey on **23 January** found some debris in the surface water brick culvert in Carlinghow Lane, It is our conclusion that this slight restriction did not cause the flooding at 6 Enfield Close on 3 January. Any issues relating to a restriction in flow at this location would have shown in the area between Carlinghow Lane and Enfield Close rather than at one specific location.
Yorkshire Water has, following on from this comprehensive investigation into the public sewer system in the area, concluded that the flooding at 6 Enfield close was not caused by any deficiency in the public sewer system. Our conclusion of the most likely cause of this flooding is that it is a ground water flooding issues.

7.3.Flood Management team, Kirklees Council

Attended on **9 January.** Flushed through road gullies on Enfield Close and Carlinghow Lane, all clear and working. Dye-tested gully in Enfield Close, proving its connection with the YW surface water sewer in the footway – again, appears to be unobstructed. Lifted manhole covers to YW combined sewers – some signs of recent surcharging but lack of evidence of foul in the floodwater probably eliminates the combined system as the cause.

Re-checked YW surface water culvert in footway – no signs of surcharging or defects near the two available manholes. No access to the culvert near Enfield Close – arranged to construct a new manhole access to the culvert to allow further inspection of the culvert near to Enfield Close.

Attended on **20 January**. New access to culvert completed and CCTV survey to be carried out by YW.

Investigated the suggestion from the owner of the flooded property that problems with water entering the basement of the property had coincided with the development of the adjacent housing estate at The Drive/ Greenfield View over the last 5 – 10 years. Previous use of the land was as a mill development fronting Carlinghow Lane, and an 18th century house and grounds (Enfield Lodge) between the mill and Box's buildings. The remainder of the site was green field. The land has been gradually developed over the last 20 years in a piecemeal fashion with completion of the last site some 5 years ago (Enfield Lodge). Section 5 of this report comments on possible previous drainage features on this land. Surface water in the area is now drained to a comprehensive system of YW public surface water sewers.

It is possible that the various housing developments have disturbed pre-existing underground drainage but it is impossible to determine where, and to what extent, it might be related to the flood incident.

8. Assessment of Responsibilities

8.1.The Mechanism of Flooding

Organisations attending the incident all agree that the floodwater appears to be uncontaminated with foul sewage. The house drainage and YW combined sewers can therefore be eliminated as the cause of the problem.

The floodwater eased after a period of time and the site visit on 9 January witnessed dry conditions again. A leak or burst from a water main or service pipe can also therefore be eliminated.

There are few recorded problems with groundwater in the area – either through a high water table or re-emergence of groundwater to the surface from higher ground. It is unlikely that natural raising of the groundwater table through recent, previous rainfall would result in emergence in a specific location at the rate of flow/pressure experienced during the flooding. It is, however, possible that raised groundwater may force its way through weaknesses in the ground such as though caused by underground service duct/pipe runs.

There is little evidence that recent surrounding development activity has influenced the movement of groundwater or interfered with unrecorded surface water drainage.

The nearest known surface water system is the large stone culvert in the footway of Carlinghow Lane but there is no evidence that this system is related to the flooding.

A process of elimination of the known drainage assets leaves groundwater as the most likely source of the flooding, although it has not been possible to determine the precise mechanism.

8.2.Allocation of Responsibility for Further Actions

There is sufficient evidence to absolve the owners of drainage infrastructure in the area of any responsibility for the flooding.

There are no identified actions for any risk management authorities.

8.3.Further Actions and Timescales

It is likely that the flooding will reoccur if similar conditions arise in the future (sustained rainfall saturating ground).

The owner is advised to inform the Flood Management team as soon as possible if flooding reoccurs. The team will try and respond quickly enough to confirm, or otherwise, the conclusions in Section 8.1 of this report.

In the meantime, the resilience of the property to future flooding should be considered by the owner. The use of the basement as a habitable room will always leave the property vulnerable to internal flooding. The owner could consider the following measures:

- Installing a submersible pump within the unused coal store with a permanent outlet into the houses domestic drainage system. The pump should be set up as a permanent feature, installed in a wet sump, operated automatically by “float switches”
- Making the new kitchen/ flooring/ walling more resilient to flooding eg raised kitchen units, stone or ceramic flooring, water-resistant plasterboard. Move electrical sockets to a higher level on the walls.