

A47 East Norton



Flood Report

To discuss the flood report contact the Flood Risk Management Team by
e-mail: flooding@leics.gov.uk or phone 0116 305 0001

DETAILED FLOOD INVESTIGATION

Investigation Ref.:	2016-INV-201
Investigation:	A47, East Norton
Date of Flooding:	21st November 2016
Revision	FINAL

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Appendix A – Site Location Plan

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1 **EXECUTIVE SUMMARY**

1.1 **STATUTORY CONTEXT**

Section 19 of the Flood and Water Management Act 2010 (FWMA) states that, on becoming aware of a flood which meets certain predetermined criteria, the LLFA (Lead Local Flood Authority) must undertake a formal flood investigation in order to determine the relevant flood risk management authorities involved and which flood risk management actions have been (or should be) taken to mitigate future flood risk. Where an authority carries out an investigation, it must publish the results.

It was deemed necessary to complete a formal investigation into the flooding incident on 21st November 2016, at the A47 (Uppingham Road), East Norton as a fatality occurred and it was understood that at the time the highway was inundated with water. The source of the flooding to the highways was also initially not clear.

'Fatal collision on A47 in Leicestershire'

Crime number: 403 of 21st November

A man has died after a serious collision on the A47 in East Norton, Leicestershire, earlier this afternoon (Monday 21 November).

The collision occurred just before 3pm and involved a yellow Mercedes Sprinter van and a white Ford Transit.

The driver of the Mercedes sustained fatal injuries and pronounced deceased at the scene.

The driver of the Ford was taken to University Hospitals of Coventry and Warwickshire where he remains in a serious condition'.

Source: <https://leics.police.uk/news-appeals/news/2016/11/21/fatal-collision-on-a47-in-leicestershire>

1.2 **CAUSE OF FLOODING**

Over the course of the investigation it became clear that the flooding was a result of the rainfall that fell within the catchment on the 21st November 2016 and preceding weeks. This rainfall resulted in saturated land with greater than normal run off rates. The lack of existing rural drainage systems to collect and carry rainwater effectively meant excess surface water was allow to flow over ground, following natural contours across the agricultural land and eventually flowing across the highway.

1.3 **MAIN FINDINGS**

The highway drainage system was not designed to drain the amount of water flowing onto it from the surrounding agricultural land and in addition to the surface water falling on the highway on 21st November 2016. The highway was designed with a cross-fall, falling from south to north. The location of the gullies on the northern side of the road were designed to intercept all surface water falling on this section of the A47. Therefore during the prolonged rainfall on 21st November 2016, surface water from the agricultural land crossed the highway to the northern gullies for an unknown length of time.

2 INTRODUCTION

2.1 LEAD LOCAL FLOOD AUTHORITY INVESTIGATION

Section 19 of the FWMA states:

- (1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers 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

2.2 FLOOD INVESTIGATION CRITERIA

A formal investigation will be carried out if one or more of the following occurs after a flooding event:

- Loss of life or serious injury
- Critical infrastructure flooded or nearly flooded from unknown or multiple sources
- Internal property flooding from unknown or multiple sources

In the following circumstances, discretion may be used to investigate a flooding incident:

- A number of properties have been flooded or nearly flooded
- Other infrastructure flooded
- Repeated instances
- Investigation requested
- Risk to health (foul water)
- Environmental or ecologically important site affected
- Depth/area/velocity of flooding a cause for concern

2.3 RISK MANAGEMENT AUTHORITIES

The following risk management authorities were identified as relevant to the flooding on the A47 at East Norton;

- Leicestershire County Council – Lead Local Flood Authority
- Leicestershire County Council – Local Highway Authority

2.4 FLOODING INCIDENT

It was deemed appropriate to complete a formal investigation into the flooding incident on 21st November 2016 at the A47 East Norton as a fatality occurred. The road is believed to have been flooded at the time of the incident and the source of the flooding was not initially clear.

3 BACKGROUND

3.1 LOCATION

East Norton is a small village and parish located in the east of Leicestershire adjoining the A47, 14 miles from the city of Leicester (refer to the location plan in Appendix A). The study area is largely rural with the A47 situated to the south of the village connecting the west side of Leicester to Peterborough via Uppingham to the west. The County Council are not aware of any previous flooding incidents at this location.

3.2 ADOPTED HIGHWAY

The A47 (Uppingham Road) is a strategic A road within Leicestershire and has a speed restriction of 60mph at the location of the flooding incident. The A47 is a publically maintainable A road which was de-trunked in 2004. De-trunking is the act of changing responsibility from the Highway Agency (at the time, now known as Highways England). This de-trunking occurred due to the provision of a new trunk road by-passing to the south of East Norton.

The A47 has a cross fall which falls south the north. Gullies are therefore located along the northern edge of the highway in this location. The gully spacing is approximately every 19m with the carriageway being approximately 14m wide at this location. This totals approximately 266m² of highway surface being drained by each gully at this location. This is in line with typical design standards used at the time of construction. However, the design of the drainage system here does not account for additional greenfield flows from the adjacent fields.

Historical records indicate that flows drained from the section of the A47 at this location are conveyed to lower levels in the west, discharging to a watercourse (approximately 550m to the west) which flows immediately to the west of East Norton. This watercourse is culverted below the A47 and ultimately discharges to Eye Brook to the north. Although the status of the outfall to this watercourse was unknown at the time of the flood incident, the difference in elevation between the outfall and the Highway mean that this is unlikely to cause an issue.

3.3 TOPOGRAPHY

The A47 generally follows a ridge of land west to east, however in the area immediately adjacent to the flooding incident, three hectares of agricultural land (verge and track) falls in a northerly direction towards the highway.

There are two field entrances located along the southern side of the A47 in the proximity of the flooding incident (refer to Appendix A). The western most access is for an unclassified road (Photo B) and rises steeply following a route of a public byway west towards Moor Lane. From this access at the A47 the route is partially surfaced for approximately 30m. On investigation there is very little surface water catchment to this area and as such, it is not believed that significant quantities of surface water could be routed to the A47 from this access.

Further along this byway is a pronounced low point which is not identified on topographic mapping. There is potential for approximately 1 ha of land to drain towards this low point and then towards the adjacent fields to the south which are accessed from the eastern access along the A47 and cover approximately 2 ha.

These fields fall relatively steeply at a gradient of approximately 1 in 15 (from 165mAOD to 147mAOD) towards the A47 and there appears to be no surface water drainage features to intercept flows from this land. As such, there is potential for approximately 3 ha of greenfield land to drain towards the A47 at this location.

At the time of the flooding incident, water is believed to have flowed from the agricultural land, following the natural contours, channelled through the agricultural field entrance (Photo A) to the

west of the incident and on to the highway. To a lesser extent it is believed to have flowed onto the highway via the un-classified road (Photo B).

The land to the north of the A47 falls away steeply and as such it is not believed that this land contributed in any way to the flooding incident.



Photo A

Field Entrance on the south side of the A47

Source: <https://www.google.co.uk/maps>



Photo B

Unclassified County Road on the south side of the A47

Source: <https://www.google.co.uk/maps>

Appendix B illustrates the topography of the area around the incident and potential flow paths.

The updated Flood Map for Surface Water (uFMfSW) contained within Appendix C identifies this section of the highway as not being at risk of surface water flooding.

3.4 OTHER DRAINAGE SYSTEMS

No public sewerage systems are recorded at this location and therefore did not have any contribution to the flooding at this location. There are no ordinary watercourses or ditches within the immediate vicinity of the flooding incident. There also appears to be no formal drainage associated with the higher land to the south of the A47.

4 FLOODING INCIDENT

4.1 PREVIOUS FLOODING INCIDENTS

There are no reports of previous flooding at this section of the A47.

4.2 RAINFALL ANALYSIS

The Hydrological Summary produced by the Centre for Ecology and Hydrology for November 2016 stated that:

'A series of high pressure systems generally limited rainfall through the first half of November; rainfall from weak fronts was showery with relatively few intense downpours. Cold northerly air led to snowfall in northern Britain (e.g. 7cm at Bingley, West Yorkshire on the 9th). On the 19th/20th, the first named storm of the season, 'Angus', tracked across the south of England, bringing destructive winds (causing power cuts for 2,200 properties), intense rainfall (e.g. 27mm in one hour at Exeter Airport) and surface water flooding. A more disruptive low pressure system followed shortly thereafter on the 21st/22nd, slowly traversing north-eastwards across England. Persistent heavy rainfall (e.g. 70mm at Chillingham Barns, Northumberland) onto ground saturated by rainfall from 'Angus' caused substantial disruption to road and rail travel (including the South West and East Coast main lines).'

http://nrfa.ceh.ac.uk/sites/default/files/HS_201611.pdf

Under normal conditions, greenfield locations (and to some extent urban areas) have capacity to absorb some of the rainfall which hits the ground. However, where there is prolonged rainfall, the ground is unable to absorb additional rainfall, this is known as saturation. Once this occurs, any additional rainfall would be conveyed along the surface to low points, creating surface water flooding.

Based on the above information it is believed that a heavy rain storm hit this area causing excessive surface water on the highway and to run off adjacent land.

4.3 FLOODING INCIDENT

On the 21st November 2016, due to increasing number of Flood Alerts and Warnings as well as the predicted rainfall, a Flood Risk Evaluation Teleconference (FRET) was held by the County Council at 16:30 hours. This is a teleconference organised by the Leicestershire Leicester and Rutland Prepared duty officer when a flooding incident is escalating, where multi-agency organisations decide the best way to escalate the flood alert. It is also an opportunity for organisations to share and pass on information. Although this was after flood incident along the A47, records suggests there is no evidence that those participating in the teleconference had any knowledge of the flooding incident at East Norton at the time of undertaking.

During the flooding incident, surface water runoff from the saturated surrounding fields and the unclassified highway to the south of the A47 flowed in a northern direction towards the road without being intercepted by any drainage systems. The surface water continued un-obstructed across the A47 towards the gullies on the opposite side. The existing highway drainage system was unable to cope with the amount of water flowing into it from both the agricultural land and the area of highway outside the curtilage of the A47. The flood water was eventually drained away via the gullies on the northern side of the A47. The gullies were not noted as being blocked at the time of the incident and were clear of debris during a later non-intrusive inspection.

5 SUMMARY OF IMPACTS AND FINDINGS

5.1 MECHANISM AND EXTENT OF FLOODING

As a result of prolonged rainfall subsequently followed by an intense rainfall event on 21st November 2016, saturated land resulted in overland surface water flows heading north towards the A47. The A47 has a cross fall from south to north and as such, surface water had to cross the road at this location in order to reach gullies on the opposite north side, before being drained north of the highway. The flooding partially covered a length of the A47 approximately 200m long immediately east of East Norton.

5.2 IMPACTS

A fatality occurred on the public highway as it became affected by the flooding as a result of the significant rainfall; the surface water on the A47 was believed to be present at the time of the fatality on the 21st November 2016.

The highway drainage system is not designed to account for the amount of water flowing onto it from the surrounding agricultural land in addition to the flows from the highway on 21st November 2016.

6 RESPONSIBILITIES

6.1 HIGHWAY AUTHORITY

The County Council in its role as local highway authority has a duty to maintain the highway under Section 41 of the Highway Act 1980. Section 100 of the Highways Act 1980 also gives the power to prevent water running on to a highway. Further information on the Highways Act 1980 is available via the link identified within the Useful Links section of this report.

6.2 LEAD LOCAL FLOOD AUTHORITY

The County Council as the LLFA has a responsibility to investigate flood incidents under Section 19 of the FWMA.

7 **CONCLUSIONS**

The flooding that occurred on the section of the A47 was a result of the intense rainfall which fell within the catchment on the 21st November 2016 and preceding weeks. This resulted in a saturated land with greater than normal run off rates. Resulting overland surface water flows drained from the catchment towards the A47 and resulted in surface water crossing the road, eventually being drained away by gullies on the north side of the road.

As a result of this higher than normal surface water runoff, a fatality occurred.

8 RECOMMENDATIONS/ACTIONS

8.1 LOCAL HIGHWAYS AUTHORITY

The Local Highways Authority has agreed to undertake the following action:

1. To consider the installation of flood warning signs along the highway at this location.

Although it was identified that the highway gullies were functioning appropriately at the time of the incident, A47 as part of Leicestershire's strategic road network, gully attendance is currently programmed at the most regular attendance frequency. Gulley maintenance however would not prevent the highway becoming inundated with water as it followed the natural landfall across fields and onto the highway.

8.2 LANDOWNERS/RIPARIAN OWNERS

All landowner(s) should be aware of the potential for surface water run-off to flow from their land towards the A47 during prolonged and intense rainfall. They should endeavour to ensure that activities on their land do result in an increased risk of flooding. For example, furrows should cut across the gradient and not with the gradient, as the latter can increase the volume and velocity of flows leaving the site.

8.3 LEAD LOCAL FLOOD AUTHORITY

The LLFA will continue to monitor the location for any further flooding and will seek to gain a greater understanding of the flood mechanism, with a view to recommend remedial works where appropriate.

9 USEFUL CONTACTS AND LINKS

Leicestershire County Council
Highways 0116 305 0001 (Mon-Fri, 9am – 5pm)

Lead Local Flood Authority 0116 305 0001 (Mon-Fri, 9am – 5pm)
Email: flooding@leics.gov.uk

Leicestershire County Council Flood Risk Management
<https://www.leicestershire.gov.uk/environment-and-planning/flooding-and-drainage>

Land Drainage Act 1991
<http://www.legislation.gov.uk/ukpga/1991/59/contents>

Water Resources Act 1991
<http://www.legislation.gov.uk/ukpga/1991/57/contents>

Highways Act 1980
<http://www.legislation.gov.uk/ukpga/1980/66>

STATUS OF THIS REPORT AND DISCLAIMER

This report has been prepared pursuant to the Council's statutory responsibility, under the FWMA, to investigate flood incidents in its area. The statutory duty to investigate is not absolute or exhaustive. Under Section 19 of FWMA, the Council's statutory responsibility is limited to conducting investigations only to the extent the Council deems it necessary.

Where the Council deems it necessary to conduct an investigation, it is required to address two questions under 19(1) of the FWMA. Firstly, the Council is required to identify relevant "Risk Management Authorities"¹. Secondly the Council is required to investigate whether the Risk Management Authorities have exercised, or are proposing to exercise, flood risk management functions set out under Section 4 of FWMA.

The relevant flood risk management authorities identified by the Council are defined at Section 1.4 of the body of this report. The flood risk management functions which the Risk Management Authorities are proposing are described at Section 6 of the body of this report.

Beyond discharging the specific statutory responsibilities under Section 19(1) of FWMA, the intended purpose of this report is solely as a resource to assist Risk Management Authorities and stakeholders to better understand the relevant flooding incident and to mitigate risks going forward.

Although the Council has commented upon contextual issues related to the flood event, it is not the purpose of this report to determine any private rights arising from the flood event.

Nor is the purpose of this report to reach conclusions as to whether any Risk Management Authority or other stakeholder (*e.g. private land owners, public bodies or government agencies*) has breached any duty of care (*whether statutory or common law*) that they may have held.

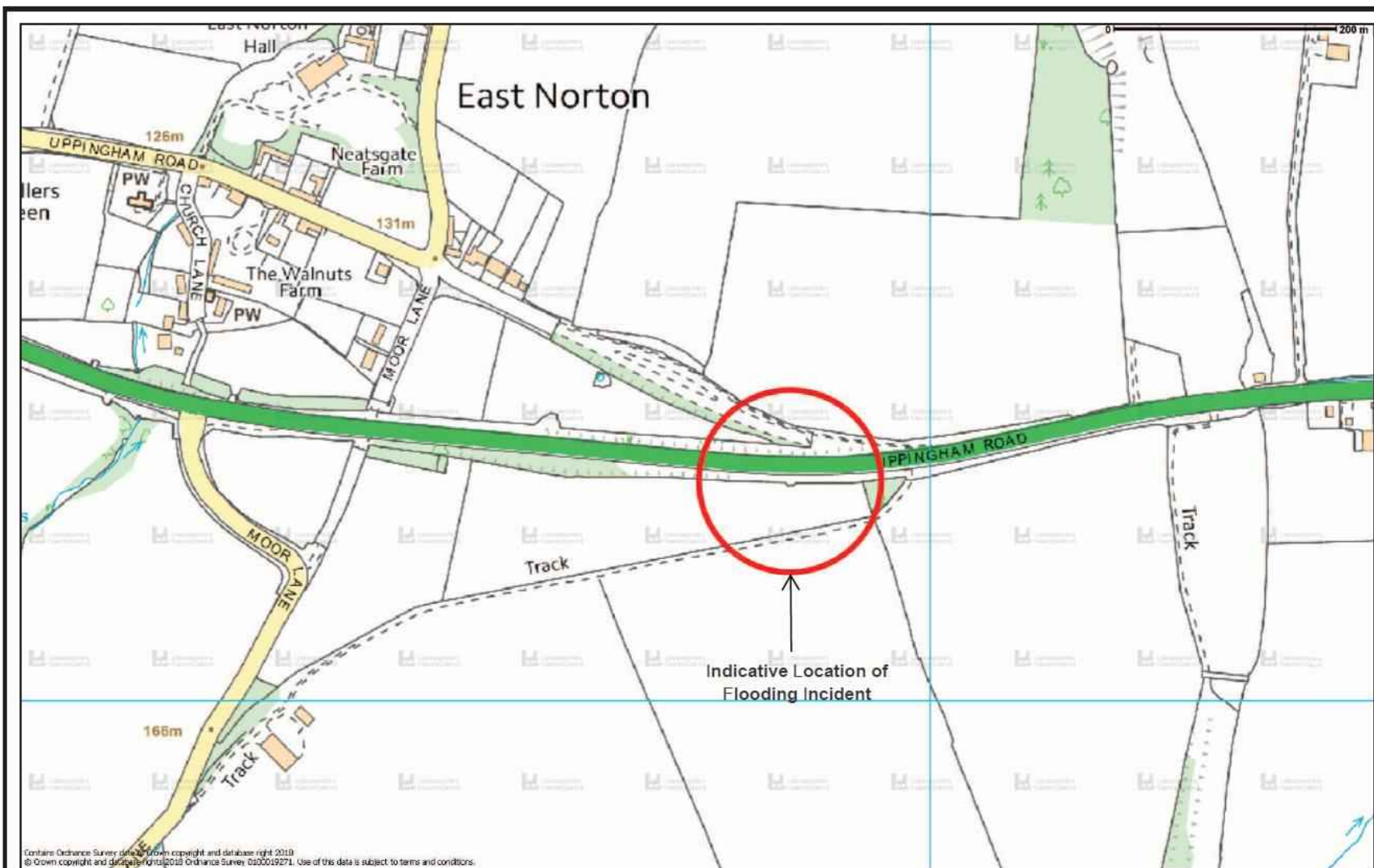
The Council has, in good faith, sought to locate and collate relevant primary and secondary evidence to prepare this report. However, the Council accepts no responsibility for assumptions or statements made on the basis of evidence which incomplete, inaccurate or both. As such, this report should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

The Council expressly disclaims responsibility for any error, omission or negligent misstatement in this report to the fullest extent permissible in law.

Further the Council does not accept any liability for the use of this report or its contents by any third party. Where any party wishes to assert any rights or cause of action related to the flooding event they are requested to rely on their own investigations. a

¹ As defined by Section 6(13) of FWMA

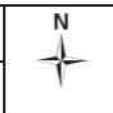
APPENDIX A SITE LOCATION PLAN



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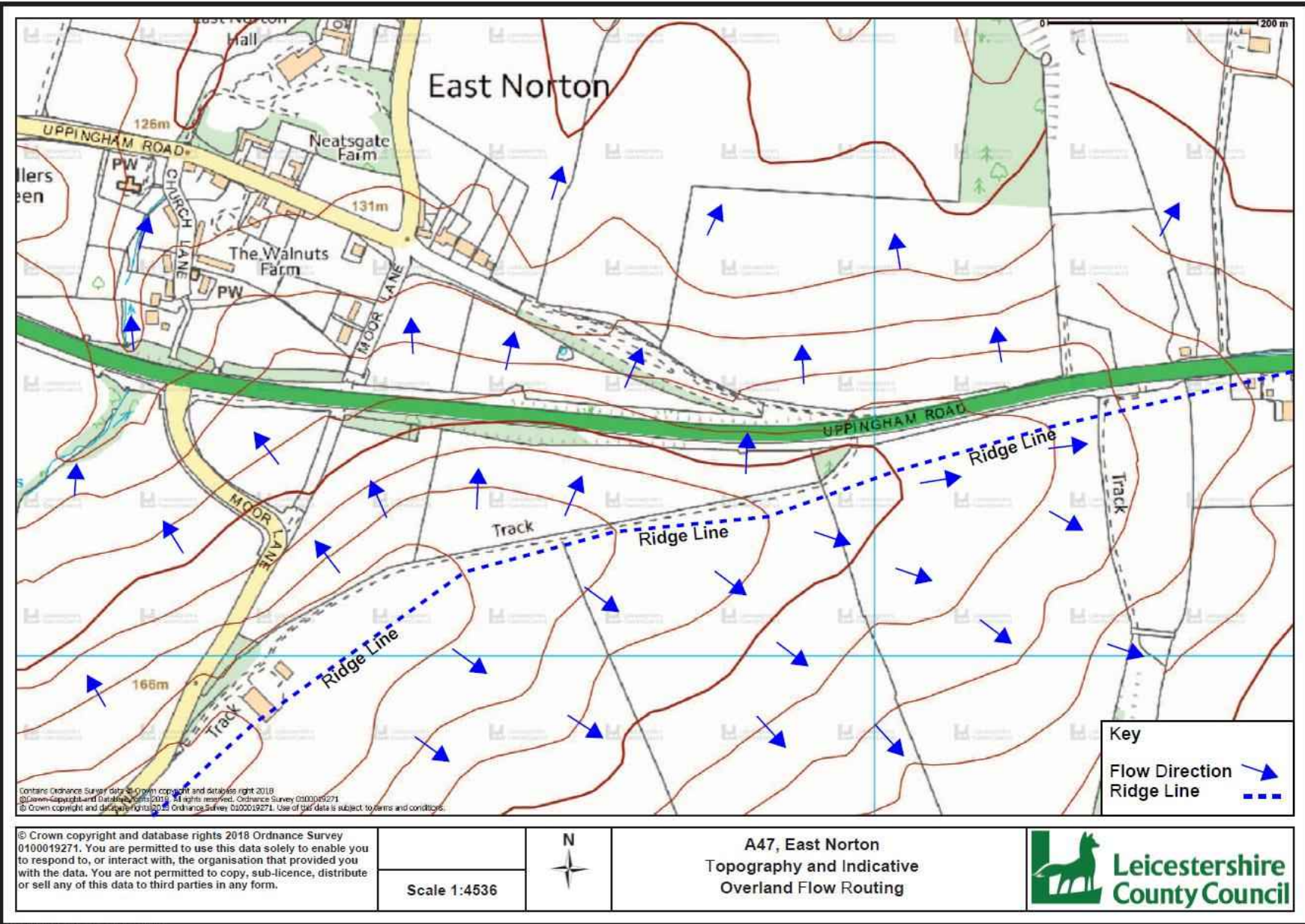
Scale 1:4536



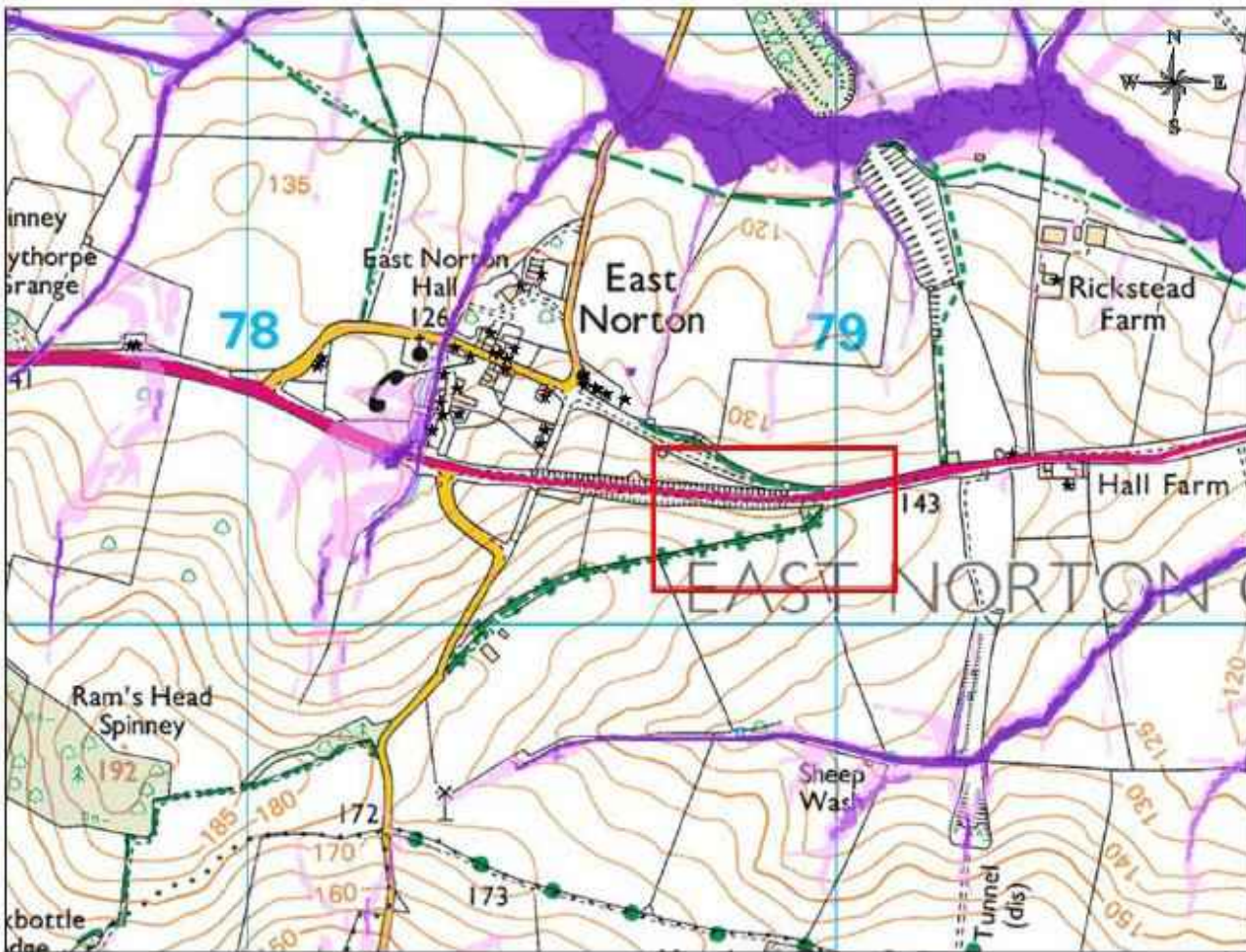
A47, East Norton
Indicative Location of Flooding Incident



APPENDIX B CONTOURS AND LOCATION OF ACCESS AND FLOW PATHS



APPENDIX C UPDATED FLOOD MAP FOR SURFACE WATER



updated Flood Map for Surface Water

- 9.33% AEP (1 in 30 Years)
- 1% AEP (1 in 100 Years)
- 0.1% AEP (1 in 1000 Years)

Location of flooding

- Approximate location of flooding



**Leicestershire
County Council**

ENVIRONMENT AND TRANSPORT
DEPARTMENT

ON BEHALF OF THE
DIRECTOR

LEICESTERSHIRE COUNTY COUNCIL
ENVIRONMENT AND TRANSPORT

SERVICE:
LEAD LOCAL FLOOD AUTHORITY

TITLE:
updated Flood Map
for Surface Water

LOCATION:
UPPINGHAM ROAD, EAST NORTON

DRAWING NUMBER	SCALE
2016-INV-201	Not To Scale
CREATED BY	DATE: 08-12-2016
	SIZE: A4
EMAIL: flooding@leics.gov.uk	
PHONE: 0116 305 0001	
COUNTY HALL • GLENFIELD • LEICESTER • LE19 1RU	

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This is not a definitive record, but is based on the best available information and is given without warranty. If roadside ditches are present, the normal presumption is that these do not generally form part of the publicly maintainable highway. This plan has been produced in relation to the specified area of enquiry and should not be used for any other purpose, since its accuracy can not be guaranteed.

Contains public sector information licensed under the Open Government licence v 2.0

This map gives an indication of the broad areas likely to be at risk of surface water flooding. It is not suitable for use at an individual property scale due to the method used.