

Section 19 Flood and Water Management Act 2010

Compiegne Way, Bury St Edmunds

Customer Report References:

433275, 436134, 438279, 438878, 438906, 440864, 441625, 441769, 441777, 442772, 443982, 444045, 444075, 445639, 446298 & 453216



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Executive Summary

Location: Compiegne Way, Bury St Edmunds

Flood risk: Combination of surface water/pluvial and groundwater flooding

Impact of flooding: Closure of major transport route for periods ranging from hours to weeks on repeated occasions recorded over the last 10-15 years

Actions completed to date: Highway cleared of excess water and silt to enable access to the drainage network for remedial works, highway drainage network cleansed, pumps replaced and road surface repaired. An investigation into possible contribution of adjacent reservoir to the flooding incident has also been completed.

Key recommendations:

Short term actions/quick wins

1. Extend pump design life and reduce pollution input to the River Lark by:
 - replace filter drains (to include lining to prevent groundwater ingress),
 - change maintenance regime to include proactive maintenance for the most heavily silt laden section of highway,
 - add proprietary treatment upstream of the pumps.
2. Increase street cleansing frequency (during beet campaign) to capture silt before it enters the highways drainage network.

Medium Term Actions (Longer timescales but potential for greater impact)

3. Commission ground investigation to confirm underlying geology and install boreholes to monitor groundwater levels in order to prepare for flooding.
4. Reduce highway catchment relying on the pumps, by diverting the most westerly section of Compiegne Way directly to the river via suitable pollution mitigation.
5. Add additional storage in the form of roadside ditches to accommodate water volumes during less significant flooding events.
6. Lift the level of the outfall to the River Lark to reduce times when pumps cannot discharge at full capacity.
7. Consider the installation of signage to highlight to road users to risk of flooding and prevent damage to vehicles by reducing attempts to drive through floodwaters.
8. Consider traffic regulation order (TRO) to restrict HGV traffic along local roads when Compiegne Way flooded.
9. Investigate if traffic flows within factory could be rerouted to avoid HGVs using local roads to access A14 when Compiegne Way flooded

Long Term Actions (Significantly longer timescales and budget required but greater mitigation potential)

10. Raise the level of the road above ground water level to prevent it being subject to groundwater flooding on such a frequent basis.
11. Consider rerouting the traffic on Compiegne Way to prevent it being displaced onto local roads during a flood event

12. Increase pump and network capacity. NB: this should only be considered as a last resort with the above options considered first (subject to cost benefit analysis) as pumping groundwater into the River Lark via a highways drainage network is not a sustainable long term solution.

Justification for Investigation

Suffolk County Council, Lead Local Flood Authority (LLFA) has determined that in accordance with our criteria, it is considered necessary and appropriate to carry out an investigation into this flood event.

This is in accordance with Section 19 (1) of the Flood and Water Management Act 2010, and in accordance with Section 19 (2) of the Flood and Water Management Act 2010, to publish the results and notify the relevant risk management authorities (RMAs).

Section 19 local authorities: investigations

(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.

Criteria for an investigation (as per Appendix D of the Suffolk Flood Risk Management Strategy):	✓
There was a risk to life because of flooding?	
Internal flooding of one property (domestic or business) has been experienced on more than one occasion?	
Internal flooding of five properties has been experienced during one single flood incident	
Where a major transport route was closed for more than 10 hours because of flooding	✓
Critical infrastructure was affected by flooding	
There is ambiguity surrounding the source or responsibility of a flood incident	✓

Flood Incidences

1. Location of Flooding –

The location of the flooding is a 200m stretch of Compiegne Way, Bury St Edmunds (major transport route) between locations A and B, see Figure 1.

Both sides of the carriageway are significantly impacted by floodwater, with the slightly lower western carriageway experiencing greater flood depths than the eastern carriageway (see dates in Table 1). This section of highway is a significant route for HGVs accessing the British Sugar factory immediately to the west of the highway, particularly during the sugar beet 'campaign' season (October to March), with resultant high traffic flows and silt loading associated with this ongoing use. This section of highway is also relied upon by vehicular traffic approaching Bury St Edmunds from the north-east.

Figure 1 - Investigation Area Map

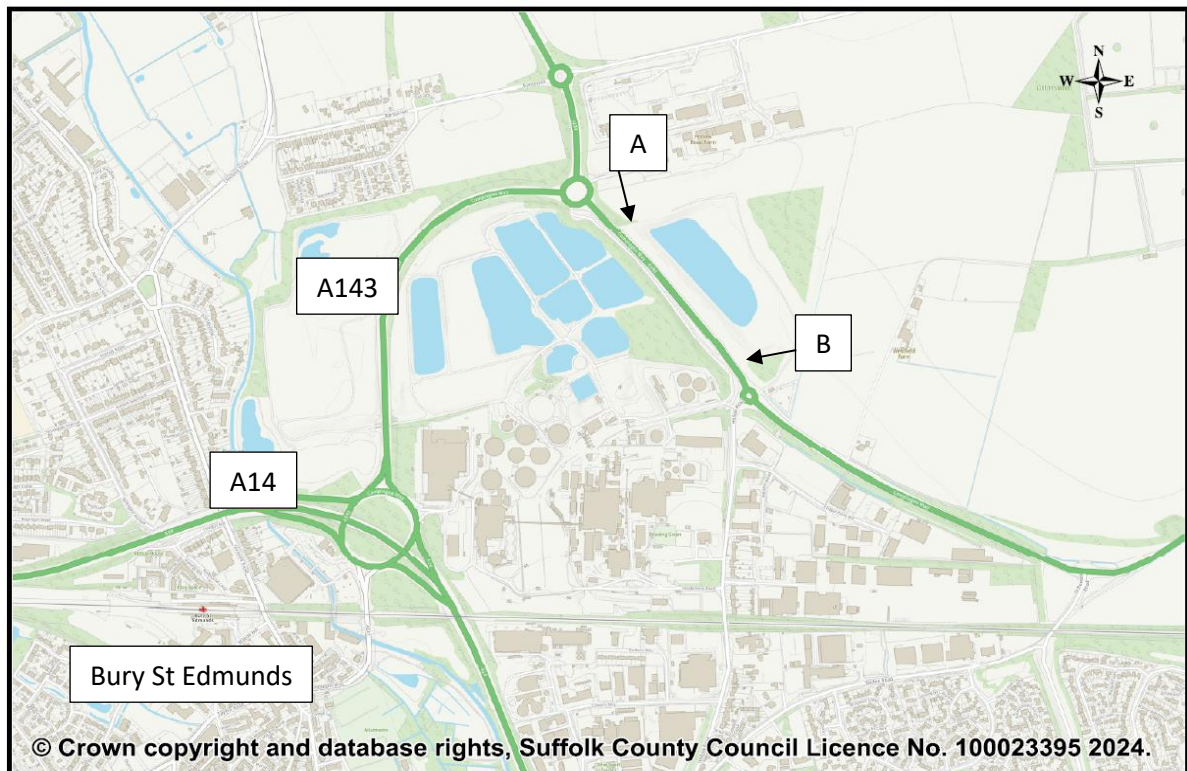


Table 1 – Flood incidents to be investigated

Date of incident	Incident as reported	Response
January 2024*	Flooding on the highway resulting in the highway being formally closed for approximately 1 month while investigations and remedial works ongoing	Road cleared of water/ice, silt and debris, both pumps replaced, repaired damage to road surface. Repairs delayed by continuous inflow of water onto road from unknown source.
February 2024*	Flooding on the highway resulting in the road being closed for 12-24 hours	Drainage pumps and river level inspected, river levels found to be too high for pumps to discharge with excess water being removed. Water dissipated once river levels reduced.

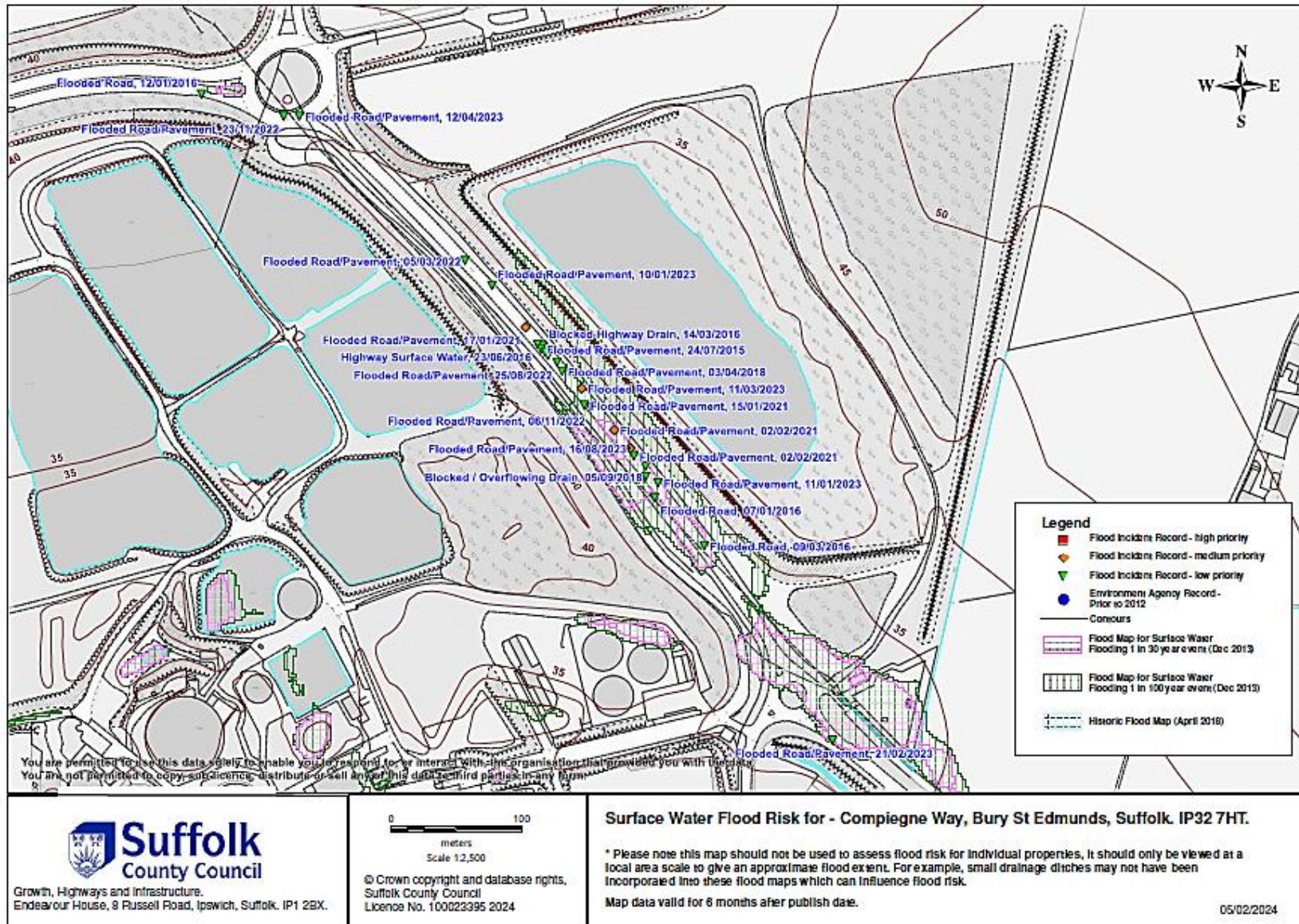
2. Records of any historical flooding

Having reviewed Suffolk County Council’s highways reporting tool, local media reports and local social media sources, the road has been impacted by floodwaters regularly during the late winter/early spring period over recent years. The dates are listed in Table 2 below and shown on plan in Figure 2 overleaf.

Table 2 – Historic Flood Incidents

Date(s) of incident(s)	Impact	Rainfall Intensity (if known)
December 2023*	Ongoing flooding issues, road closed for period of time ranging from hours to weeks (limiting access to the British Sugar factory and preventing residents/visitors accessing Bury St Edmunds from the north-east), damage to road surface, cars stranded, insurance claims etc...	Often following heavy or prolonged rain (eg. after Storm Babet in October 2023) but not always with some flooding occurring even after short and relatively light rainfall events. 75% of the flooding events occur during the winter or early spring seasons (see dates with asterisk* in tables 1 and 2).
October 2023*		
August 2023		
April 2023*		
March 2023*		
January 2023*		
November 2022*		
August 2022		
March 2022*		
February 2021*		
January 2021*		
September 2018		
April 2018*		
June 2016		
March 2016*		
January 2016*		
July 2015		

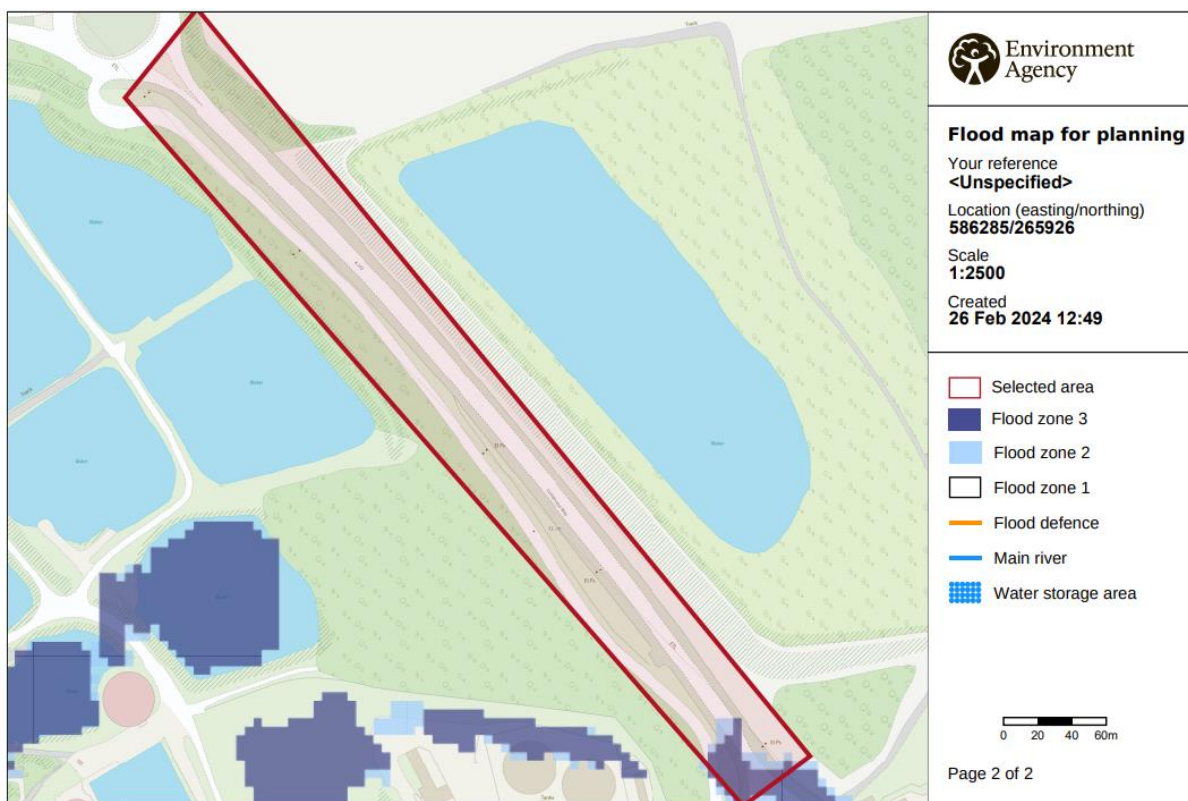
Figure 2 - Historic Flood Incident Records



3. Predicted Flood Risk

3.1 Fluvial (main river) flooding presents a high risk to the southern end of this stretch of Compiegne Way, see Figure 3. However, the rest of the highway is not predicted to be impacted by fluvial flooding. Therefore, this has been discounted as a contributor to flooding in this location. It should be noted however, that the outfall for the drainage from Compiegne Way (see section 3.3) sits below the predicted annual peak river level, so when river levels are particularly high, the highway drainage cannot discharge at full volume, which can indirectly cause flooding of the highway.

Figure 3 – Fluvial flood map - <https://flood-map-for-planning.service.gov.uk/>



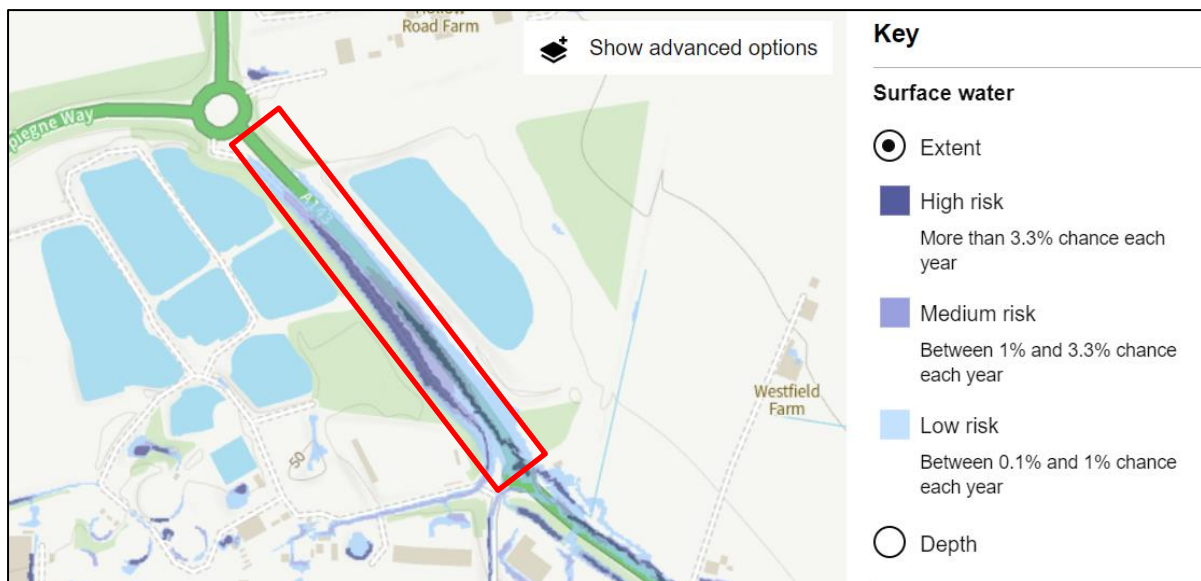
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3.2 Coastal flooding is not considered to be a contributor to flood risk at this location due to the site's inland location.

3.3 Pluvial (surface water/rainfall runoff) flooding is shown on the long term risk of flooding mapping (see Figure 4) to present a high to medium risk to the site and is thus considered to be a contributor to flood risk locally. As this section of Compiegne Way sits lower than the surrounding landscape, surface water is likely to flow through and accumulate in this area after heavy or prolonged rainfall.

The current drainage arrangement comprises water runoff from approximately 1.5km of road network towards this section of Compiegne Way as it is the lowest spot locally(see plan in Appendix A). The water then drains into a sump and pump system which pumps the water via approximately 1km of piped network into the River Lark. Most drainage networks operate by gravity rather than relying on a pumped system and so are not dependant on electrical or mechanical means to remain dry (which is not possible here due to the level of the road compared to surrounding land). This adds an element of risk to the resilience of the drainage network locally, which is an unavoidable consequence of the natural topography.

Figure 4 – Pluvial flood map - <https://check-long-term-flood-risk.service.gov.uk/>



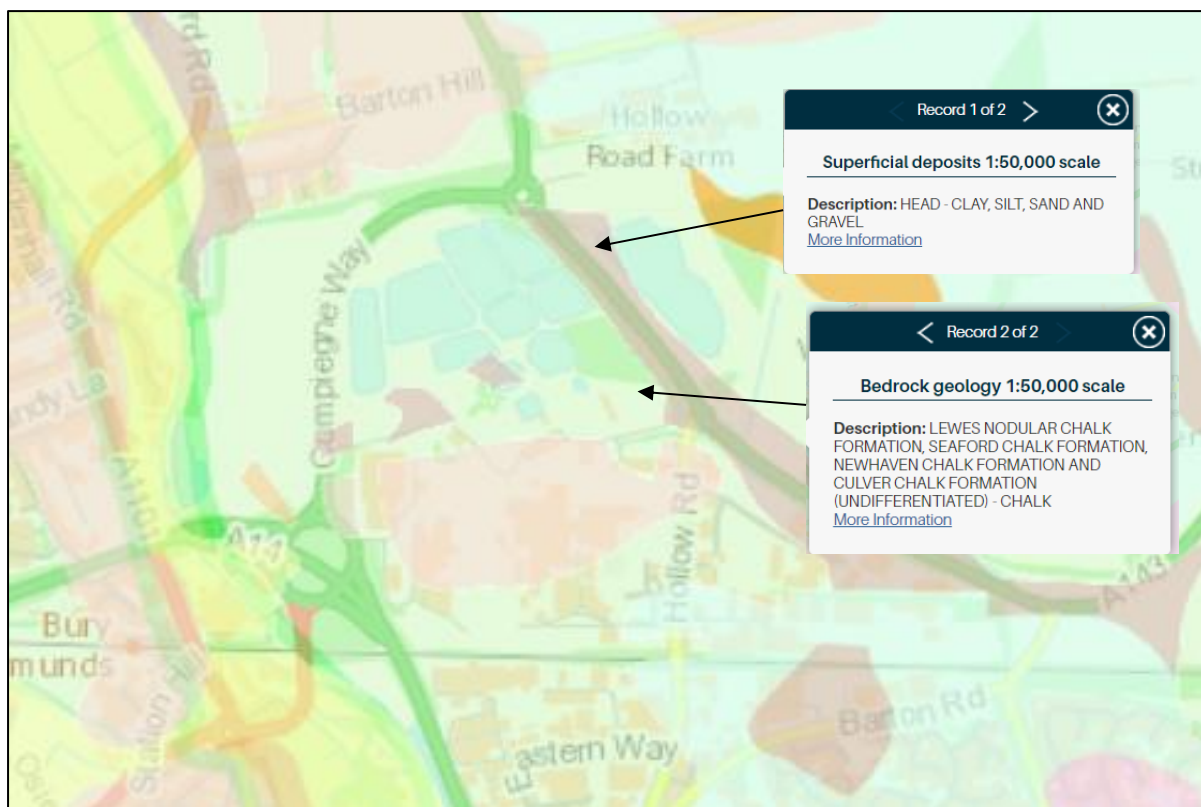
3.4 Groundwater flooding is known to present a significant risk to large parts of Bury St Edmunds, particularly low-lying areas. This is due to the location of a significant chalk aquifer underneath the town which has the potential to hold vast quantities of water. During the summer months, the groundwater resource supplies streams and springs locally which gradually reduces the volume of water in the aquifer. Lower rainfall and natural demands from vegetation alongside abstraction points (for irrigation and potable water supplies) also contribute to lower summer levels. During the winter however, the aquifer recharges with levels typically reaching a peak in March/April.

Groundwater data was sourced from the Hydrology team at the Environment Agency to support this investigation and current groundwater levels (February 2024) are recorded to be approximately 32m above ordnance datum (AOD) with this level stated to be 'notably high' compared to data over the last 40 years. As this section of Compiegne Way sits at approximately 32.6m AOD, groundwater levels are understood to currently be either at or just below the

surface of the road. This was initially reported by highway engineers reporting water ‘bubbling’ out of the verge and onto the road even during dry periods and observations were then confirmed by a panel engineer whilst undertaking an assessment of the adjacent reservoir. Periods of the year where groundwater levels are often ‘above normal’ or ‘notably high’ (winter/early spring) also correlate strongly with previous reports of flooding.

The geological mapping (shown in Figure 5) shows that the road surface is constructed on a narrow strip of impermeable clay, silt, sand and gravel over the deeper chalk deposits. The narrow strip of clayey material is likely to remain saturated longer than surrounding areas even when groundwater levels begin to drop. The deeper chalk aquifer deposits hold the groundwater and the groundwater observed emerging from the verge is likely to be at the edge of the narrow band of clay.

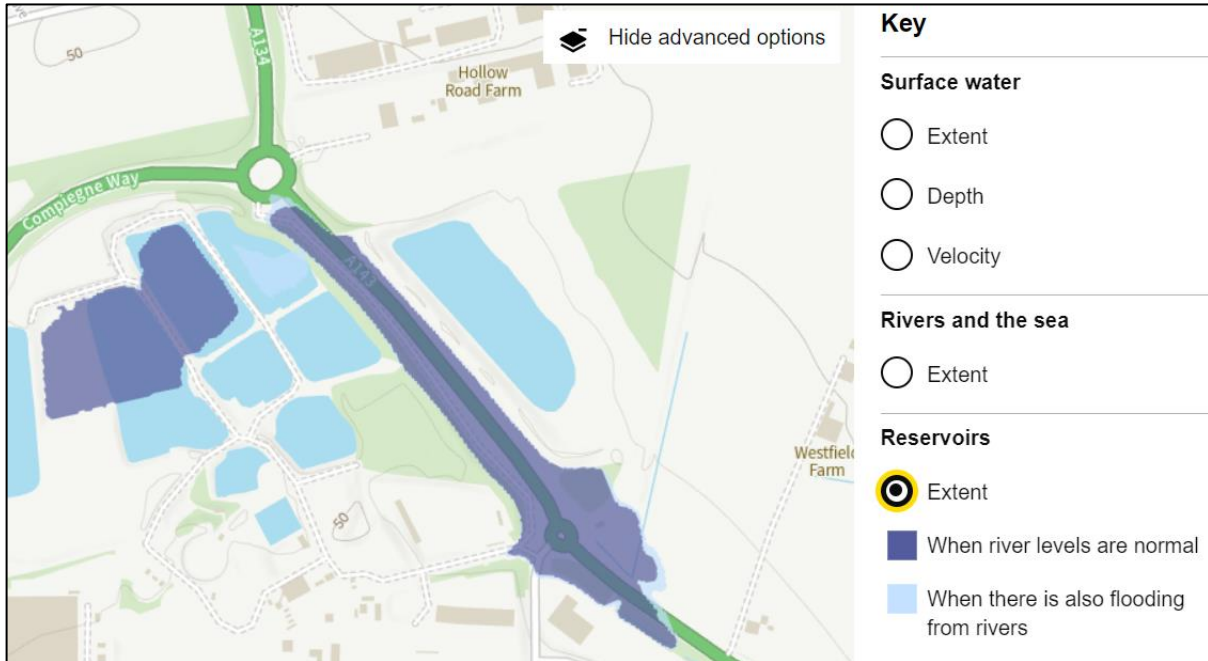
Figure 5 – Geological mapping - <https://www.bgs.ac.uk/>



3.5 Reservoir flooding is predicted to present a source of flood risk at this location (Figure 6). As part of this flood investigation, we have been provided with a recent assessment of the reservoir owned by British Sugar to the north-east of Compiegne Way (dated February 2024). The panel engineer responsible for the reservoir assessment has stated that it is functioning normally with no evidence of leaks. The reservoir functions as a storage lagoon into which treated wastewater from beet processing is pumped so it can naturally dissipate to ground. Although this will recharge groundwater levels locally (given the large

surface area over which this occurs and limited depth of water in the lagoon at any point), this is considered to have a minor impact at most on the flooding and far outweighed by the shallow groundwater issues. The reservoir can therefore be discounted from the list of significant contributors to the flooding experienced.

Figure 6 – Reservoir flood map - <https://check-long-term-flood-risk.service.gov.uk/>



Flooding Sources & Likely Causes:

Having considered all the above sources of flood risk (fluvial, coastal, pluvial, groundwater and reservoir flooding), I consider that the main sources of flood risk at this location are a combination of surface water/pluvial and groundwater flooding.

The following causes of the repeated flooding incidents are thus related to surface water and groundwater sources:

- Seasonally high groundwater table, with groundwater sitting at or just below the road surface with water emerging from chalk aquifer in the verges and flowing into the highway drainage network during particularly high groundwater periods (including winter 2023/2024), with water reported in the drainage network even after no rainfall.
- No natural point of discharge for water, with a capping layer of impermeable deposits directly beneath the highway preventing fast infiltration of water to ground (even when groundwater levels are low). No gravity connection to the river, with the highway drainage relying on a pumped discharge which is susceptible to failure.

- High silt loading from HGV traffic carrying the beet to the adjacent factory, combined with a change to highway maintenance schedule (move from proactive to reactive maintenance at this location) resulting in very frequent pump burnout. Whilst the lack of maintenance has been considered by many to be the main cause of the flooding, given that the system was cleansed and pumps replaced in January 2024, and the road closed again due to flooding less than a month later in February 2024, it is clear there are other more significant factors at play.
- Outfall of the pumped system being at or below predicted peak river levels in the River Lark so during high river flows the pump cannot operate at full capacity.
- A large catchment area (1.6km of highway) relying exclusively on pumped drainage, any pump failure therefore results in significant impacts.

Flooding Pathway

Surface water from the large highway catchment naturally flows to the low point in Compiegne Way where the pumped system is located. Groundwater also emerges at this point as it is the lowest point in the topography locally. Thus, this section of the highway is particularly vulnerable to significant and prolonged periods of flooding.

Flooding Receptors

When flooding occurs, Compiegne Way is either partially blocked by floodwaters, or is flooded to a depth where an emergency road closure has to be implemented. Due to the nature of the flooding and the involvement of groundwater it does not drain away quickly and the closures have to remain in place for extended periods of time while the water dissipates/is removed, and the drainage network and/or road surface can be remediated at great cost to the county and district councils.

Not only does this have a significant impact on vehicular traffic in the form of cars and HGVs that cannot use the road and have to take alternative routes, but also on local residents and businesses who rely on this road for access into and out of Bury St Edmunds. This road is part of Suffolk's resilient network and also forms part of the diversion route for closures of the nearby A14 trunk road and is thus a critical part of local highway infrastructure.

Photos of Flooding



Flooding in January 2024 © EADT



Flooding in January 2024 © Suffolk News



Flooding in March 2023 © EADT

Risk Management Authorities, Non-Risk Management Authorities and flood risk functions

Risk Management Authority	Relevant Flood Risk Function(s)
Suffolk County Council	Lead Local Flood Authority, Highways Authority & Asset Owner
West Suffolk District Council	Local Planning Authority & Asset Owner
Non-Risk Management Authority	Relevant Flood Risk Function(s)
British Sugar	Owner/operator of adjacent reservoir

Actions completed to date:

Action	Risk Management Authority	Progress
Clear highway of excess water and silt to access drainage network to carry out remedial works	Suffolk County Council Highways Authority	Completed
Cleansing of highway drainage network, replacement of pumps and repair of road surface	Suffolk County Council Highways Authority	Completed
Investigation of possible contribution of adjacent reservoir to the flooding incident	British Sugar	Completed

LLFA Recommended Actions:

Action	Risk Management Authority & Timescale for response	Latest Progress Update for Actions
Short Term Actions (Quick Wins)		
1. Extend pump design life and reduce pollution input to the River Lark by: <ul style="list-style-type: none"> - replace filter drains (to include lining to prevent groundwater ingress), - change maintenance regime to include proactive maintenance for the most heavily silt laden section of highway, - add proprietary treatment upstream of the pumps. 	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
2. Increase street cleansing frequency (during beet campaign) to capture silt before it enters the highways drainage network.	West Suffolk District Council, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
Medium Term Actions (Longer timescales but potential for greater impact)		
3. Commission ground investigation to confirm underlying geology and install boreholes to monitor	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs

groundwater levels in order to prepare for flooding.		
4. Reduce highway catchment relying on the pumped system, by diverting the most westerly section of Compiegne Way directly to the river via suitable pollution mitigation.	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
5. Add additional storage in the form of roadside ditches to accommodate water volumes during shorter/less intense rainfall events or minor groundwater flooding incidents. These would also serve to capture silt and protect the pumps/River Lark and would be more easily maintainable than below ground drainage networks.	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
6. Lift the level of the outfall to the River Lark to reduce times when pumps cannot discharge at full capacity and provide erosion protection to mitigate any adverse impact of the near constant flow into the river.	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
7. Consider the installation of signage on the road to highlight to road users to risk of flooding and prevent damage to vehicles by reducing attempts to drive through floodwaters.	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
8. Consider traffic regulation order (TRO) to restrict HGV traffic along local roads when Compiegne Way flooded	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
9. Investigate if traffic flows within factory could be rerouted to avoid HGVs using local roads to access A14 when Compiegne Way flooded	British Sugar, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
Long Term Actions (Significantly longer timescales and budget required but equally greater mitigation potential)		
10. Raise the level of the road above ground water level to prevent it being subject to groundwater flooding on such a frequent basis.	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs

11. Consider rerouting the traffic on Compiegne Way to prevent it being displaced onto local roads during a flood event	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs
12. Increase pump and network capacity. NB: this should only be considered as a last resort with the above options considered first (subject to cost benefit analysis) as pumping groundwater into the River Lark via a highways drainage network is not a sustainable long term solution.	Suffolk County Council Highways Authority, timescale to be determined after consultation with RMA	Viability of recommendation and timescale for action under review by RMAs

Approval

This report will be reviewed and updated every 6 months until actions are marked as complete.

Reviewer	Date of Review

Disclaimer

This report has been prepared and published as part of Suffolk County Council's responsibilities under Section 19 of the Flood and Water Management Act 2010. It is intended to provide context and information to support the delivery of the local flood risk management strategy and should not be used for any other purpose.

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore while all reasonable efforts have been made to gather and verify such information may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

The opinions, conclusions and recommendations in this Report are based on assumptions made by Suffolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.

Suffolk County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and Suffolk County Council

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The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to Suffolk County Council highlighting flooding to properties at a street level. Property owners and prospective purchasers or occupiers of property are advised to seek and rely on their own surveys and reports regarding any specific risk to any identified area of land.

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Appendices

Appendix A – Plan of contributing highway network

Appendix A – Plan of contributing highway network

