



Mrs Haf Barlow
Town Clerk
Poynton Town Council
Civic Hall
Off Park Lane
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SK12 1RB

Our Ref: JRB\2022s1424-S-L001-1

27th November 2022

By e-mail only: Haf.Barlow@poyntontowncouncil.gov.uk

Dear Mrs Barlow,

Re: Poynton Pool – Proposed Works to the dam

Thank you for the instructions from the Town Council for the provision of advice on the proposals for works to the dam at Poynton Pool.

I visited the site on 23rd November 2022 accompanied by yourself, Nigel Fore (Flood Working Group), David Massingham (Friends of Poynton Pool, and Mike Sewart (Cheshire East Councillor and Poynton Town Councillor).

We had some discussion on site regarding residents' concerns. It was a clear day with intermittent showers, and I was able to walk along the dam crest and inspect the dam shoulders and overflow. The Pool was full and spilling (i.e. water was flowing over the outlet weir and into the pipe culvert).

In addition to the site visit, I have also reviewed the following documents:

- Planning Application reference 22/4001S by Cheshire East Council for EIA screening opinion for Poynton Pool Reservoir flood resilience improvement scheme.
- Response by Cheshire East Council to questions submitted by Poynton Town Council (undated).

Site description

Poynton Pool is an artificial water body created in the 1750s by Sir George Warren, who dammed a tributary of Poynton Brook as part of his landscaping of the parkland around Worth Hall. The Pool and the dam are now owned by Cheshire East Council.

The Pool is located in the north east of Poynton at OS grid reference SJ 922 844 (see Figure 1 below). Based on the OS 1:10,000 scale map, it has a surface area when full of approximately 68,000 square metres (16.8 acres). The registered volume when full is 130,000 cubic metres (28.6 million gallons).

The Pool has been formed by the construction of an earth embankment dam running parallel and to the east of the A523 London Road along a north-south axis for a distance of approximately 800 metres (see Figure 2). The dam varies in width and height but is highest in the location of the overflow (which probably coincides with the original watercourse 'valley').

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The dam has an informal crushed stone footpath along the crest and has trees of various maturity along its entire length, especially on the downstream slope between the Pool and the A523.

Water levels in the Pool are controlled by an outlet weir located approximately 145 metres from the northern end of the dam. The inlet weir has a security/debris screen to prevent unauthorised access and to collect larger debris. Flow from the weir cascades into a brick chamber before entering a pipe culvert which carries it through and under the dam and the A523 road to discharge into an open watercourse channel to the west.

I was informed that the Pool may have a low-level outlet comprising a 'plug' in the bottom of the lake which can be removed to allow emptying for maintenance. I could see no sign of this during my visit.

Is the Pool a 'reservoir' as defined by the Reservoirs Act?

The Pool is registered as a 'large raised reservoir' under Section 1 of the Reservoirs Act 1975 (RA1975). This is a legal requirement for any body of water in England above 25,000 cubic metres in volume which is retained by an engineered structure such as a dam. Although the registered volume of 130,000 cubic metres is probably only approximate and some of it may be silt, it is clear the Pool is well above the threshold for registration. There is also clearly an engineered structure impounding the water. Hence, there is no doubt that the Pool is a 'large raised reservoir' as defined by the RA1975.

Only the permanent modification to reduce its potential stored volume below 25,000 cubic metres - and certification by a qualified engineer - would remove it from the ambit of the Act. If the Pool water level was permanently lowered, it would reduce the size and depth of the lake (average depth would need to be less than 0.385 metres to be under the 25,000 cubic metre threshold). Dividing the Pool into separate lakes is unlikely to reduce the escapable volume below the threshold as they would still be considered 'linked'.¹

What potential risk does the Pool present?

The Pool has been designated as a 'High Risk' reservoir under Section 2A of the RA1975 by the Environment Agency as it is considered that in the event of an uncontrolled release of water from the reservoir, human life could be endangered. This designation will have been based on, amongst other things, the results from a computer simulation of the potential flood depths and velocities to land downstream in the event of a dam breach. An excerpt from the map showing the possible consequence is provided in Figure 3. This shows the A523 road and property in Bramhall Green and Cheadle Hume potentially at risk of flooding. While the modelling will have made some assumptions regarding dam height, location of a breach, etc., given the location of the Pool close to housing, I can see no reason to question the High Risk designation.

The primary purpose of the Reservoirs Act is to ensure that 'High Risk' reservoirs are managed in such a way as to reduce the risk of flooding from a dam breach or other uncontrolled release of water to the lowest practicable level.

The key means of managing the risk is the requirement for reservoir undertakers (i.e. the owners) to appoint qualified independent engineers to inspect and examine the reservoir and to act on their recommendations. This includes at least every 10 years an Inspection under Section 10 of the Act. As part of such an Inspection the engineer will assess the reservoir and dam against the current safety standards and guidelines. Even if the reservoir is many years old it must still meet the current standards. These change with time in light of improved techniques such as flood estimation and learning from dam incidents (such as that from Toddbrook in Derbyshire in August 2019). An analogy is an historic hotel. Even if there has

¹ It is worth noting that there is an on-going consultation by Defra regarding lowering the threshold for a large raised reservoir to 10,000 cubic metres.

never been a fire, it must still comply with modern standards even if to do is costly and may require alterations to the building.

An important part of the assessment following an Inspection is whether the dam can safely pass a 'design' and 'safety check flood'. This is to ensure that the dam would not be breached and release water which would make a natural flood worse. I understand that Poynton Brook has been assessed as being in Category 'A' of the flood standard for reservoirs. This is the highest category and is used for a reservoir where, should the dam fail, there is a risk to life in a community. I have seen no evidence to question the appropriateness of a Category 'A' category.

The last Inspector (in c. 2013-14) recommended an updated flood safety study to assess the capacity of the existing spillway and the adequacy of 'freeboard'. Freeboard is the vertical distance between the normal full reservoir water level and the lowest part of the dam crest. For a High Risk Category 'A' reservoir such as Poynton Pool, this is currently for a minimum of 0.6 metres plus an allowance for flood rise – although this can be reduced if a quantitative risk analysis shows that a lower freeboard would be acceptable.

While I have not seen a copy of the flood safety study, the current low freeboard on the dam and the relatively small overflow size mean that in my judgement it is unlikely they meet the current requirements for a High Risk Category A reservoir. While the flood study could be independently reviewed and could even result in slightly different flow estimates, my experience suggests that they it would result in no change to the conclusion that work is needed to the dam to meet the current safety standard.

Comments on the outline design of the safety works

The planning application envisages works to a 460 metre length of the dam including some dam raising, reconstruction of the footpath and provision of a kerb. The purpose of the work is to formalise this section of the dam crest as an 'auxiliary' spillway. Any dam spillway has to be engineered to be able to resist the erosive forces from water flowing over them. This can be done in a variety of ways, and for Poynton Pool the low dam height has allowed the use of a 'softer option' which keeps some of the trees. It is important that flow is evenly distributed over the length of the spillway (hence the proposal for the kerb) and that there are no significant obstructions (such as trees and tree roots) which could disturb any overtopping flow and cause local erosion. It would appear the proposed design has looked at a compromise from removing all the trees by creating two 40 metre wide clear sections while leaving the option for some of the trees to remain elsewhere on the dam.

There are of course possible alternatives, and I would be surprised if the Council's engineering consultants have not already explored these. An alternative to making the dam crest overtoppable is to raise it (and to combine this with an increase to the flow capacity of the existing spillway). Although I have not undertaken any calculations, I would estimate that raising on its own would be of the order of a metre and perhaps more and would need to extend the full 800 metres of the dam crest if not more. This would have a significant impact - as most of the trees along the entire length of the dam would need to be felled and removed. A larger spillway would be very expensive, involve partial closure of the London Road during the works, and would still require some raising of the dam and removal of trees. The option proposed therefore does appear to be a reasonable compromise between maintaining reservoir safety and minimising impact. There are also potential opportunities to incorporate the works into a tree and open space management plan.

I attach some photographs (Photos 1 and 2) to illustrate how the proposed work may look when completed. I also include a photograph from Tabley Mere (Photo 3) showing works undertaken earlier this year to create a new crest path and to even out the dam crest. These may help in visualising what the work may be involve.

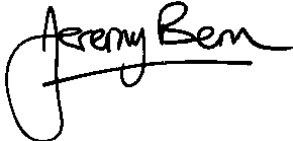
In summary, the works to the dam are a legal requirement on the Council. They either have to undertake them or permanently drain the Pool. The option proposed appears proportionate and has less impact in terms of tree loss than potential alternatives.

There may well be opportunities through careful landscaping to enhance the appearance of the Pool following the works. Cheshire East Council may well engage a specialist landscape architect to input into the detailed design. Equally that may be something the Town Council wish to consider.

I hope the above helps inform the Council officers and members in considering the proposals to the dam.

If you have any queries, please do not hesitate to get in contact. I would be happy to arrange a phone/video call with you to discuss the above.

Yours sincerely,



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Photograph 1: Hillsborough Castle, Northern Ireland



Photograph 2: National Trust Stowe (Buckinghamshire)



Photograph 3: Raising of dam crest - Tabley Mere, Cheshire (note this is for a relatively small raising of c. 0,2 metres), January 2022 during construction.

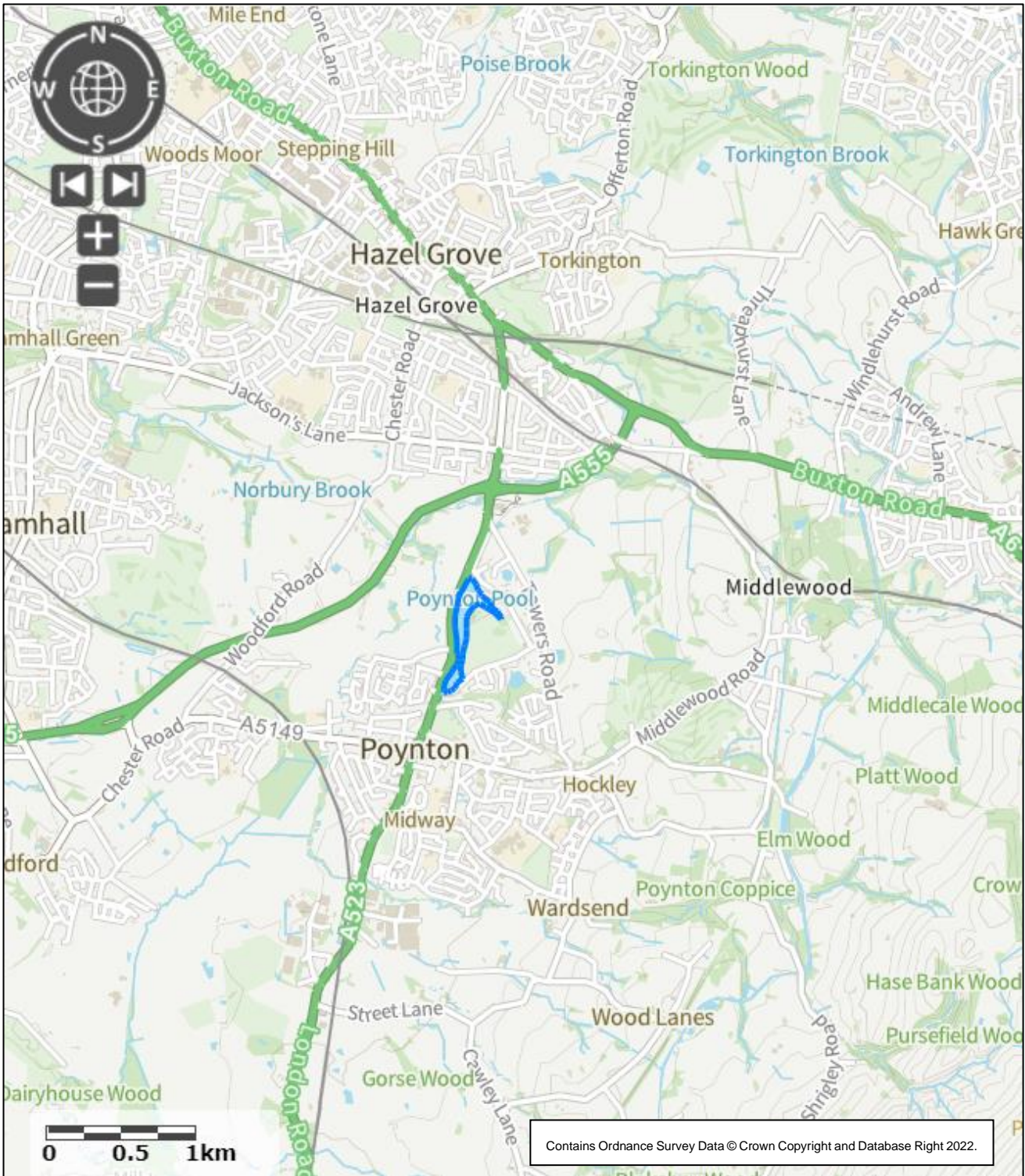


Figure 1: Location of Poynton Pool

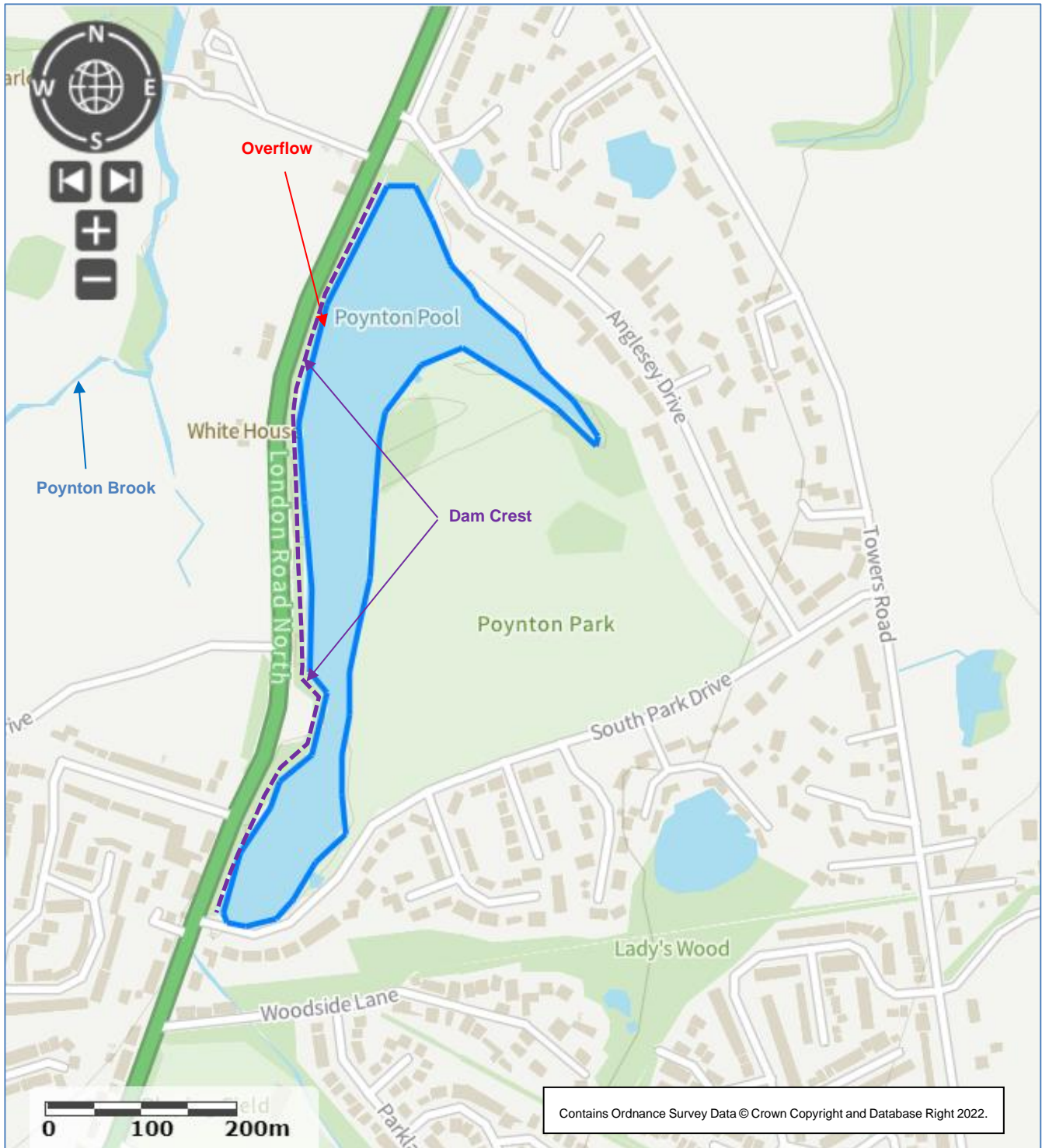


Figure 2: Key features of Poynton Pool

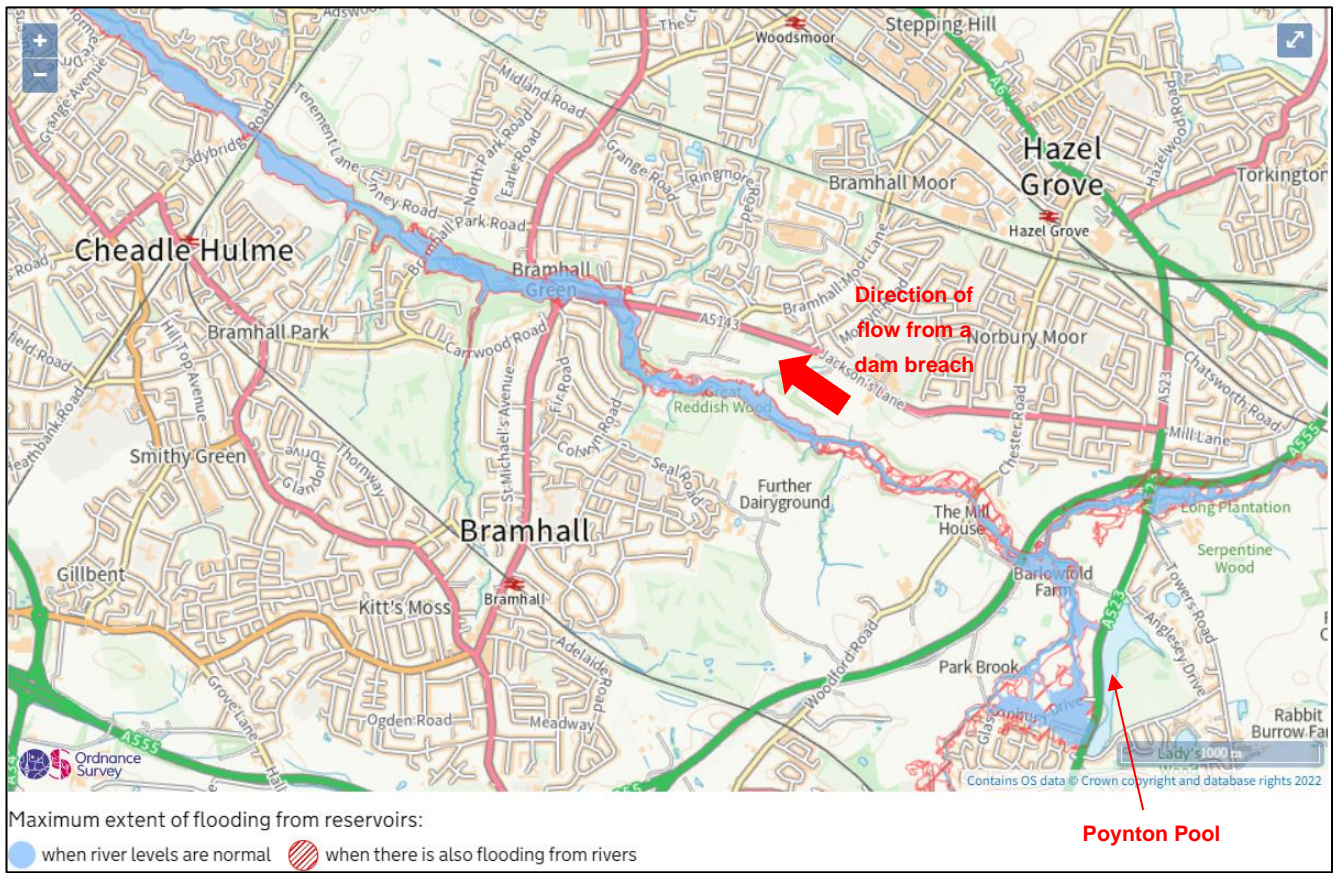


Figure 3: Estimated extent of flooding from a breach of the dam at Poynton Pool (source: The Environment Agency)