

Miles Water Engineering

Flood Risk Assessment



Project: Proposed Conservation Lake,
Wetland & Associated Earthworks

Address: Ham Cross Farm, Lower Chicksgrove,
Tisbury, Wiltshire SP3 6ND

LPA: Wiltshire Council

Project No: 24194

Planning Reference: **PL/2026/00044**

Rev	Date	Issue / Purpose / Comment	Prepared	Checked
~	24.03.26	Planning Application	AN	MWE

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1 Notes

This document to be read in conjunction with the Site Location Plan and Design & Access Statement MWE_24194_HCF_PROP-PLAN_SECTIONS-02-03.26-P02. These documents have been prepared by Miles Water Engineering and submitted as part of this planning application. They can also be seen in the appendix.

2 Site Description

This Flood Risk Assessment has been prepared in support of a planning application for a Proposed Conservation Lake, Wetland & Associated Earthworks at Ham Cross Farm, Lower Chicks Grove, Tisbury, Wiltshire SP3 6ND



Fig.1 – OS Site Location Plan

The proposed conservation lake, bio-swale and reedbed will be situated within a 6.6 ha site and located within a rural/agricultural landscape with agricultural and residential buildings set intermittently across the wider landscape. The site is bounded by Ham Cross Farm to the West, access/driveway to Ham Cross Farm to the North, the Gillingham (Dorset) to Salisbury railway line to the South and Chicks Grove Road to the East. A bridleway runs from Chicks Grove Road in the NE to the SW, dividing the site area in two. Ground levels fall from NW to SE by approximately six metres.

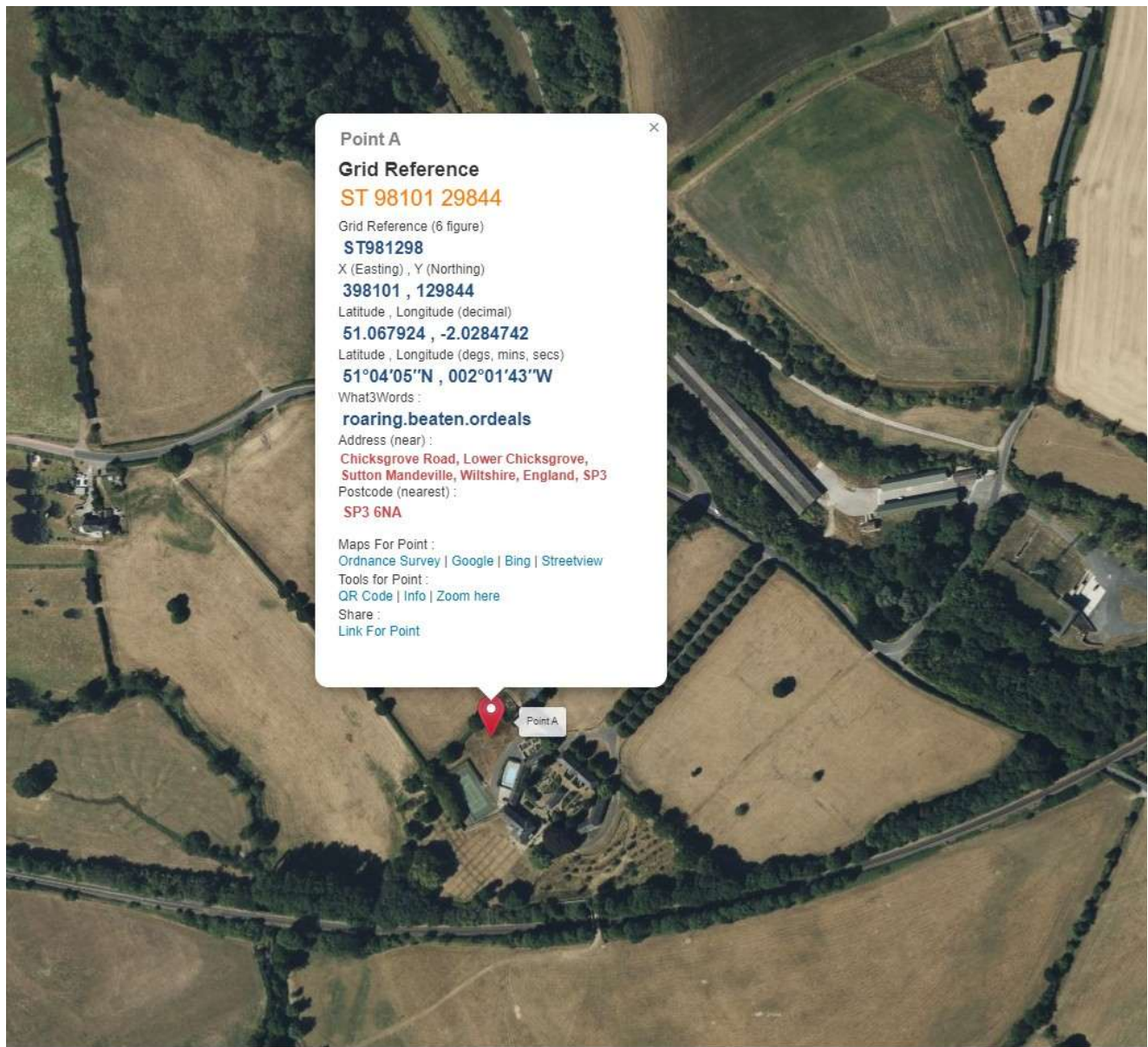


Fig.2 – Aerial Image of the Proposed Site (gridreferencefinder.com)

3 Local Watercourses

At its nearest point, the proposed new conservation lake will be located approximately 300m East of the River Nadder.



Fig.3 – The River Nadder (EA - Statutory Main River Map/arcgis.com)

4 **Geology**

The online British Geological Survey (BGS) mapping shows the site to be located above Durlston Formation-interbedded Sandstone and (subequal/subordinate) Limestone. Superficial deposits are not available within the site area however Alluvium-Clay, sand and gravel is recorded around the River Nadder. Member recorded with Breydon Formation – Peat to the north

4.1 **Bedrock Geology**

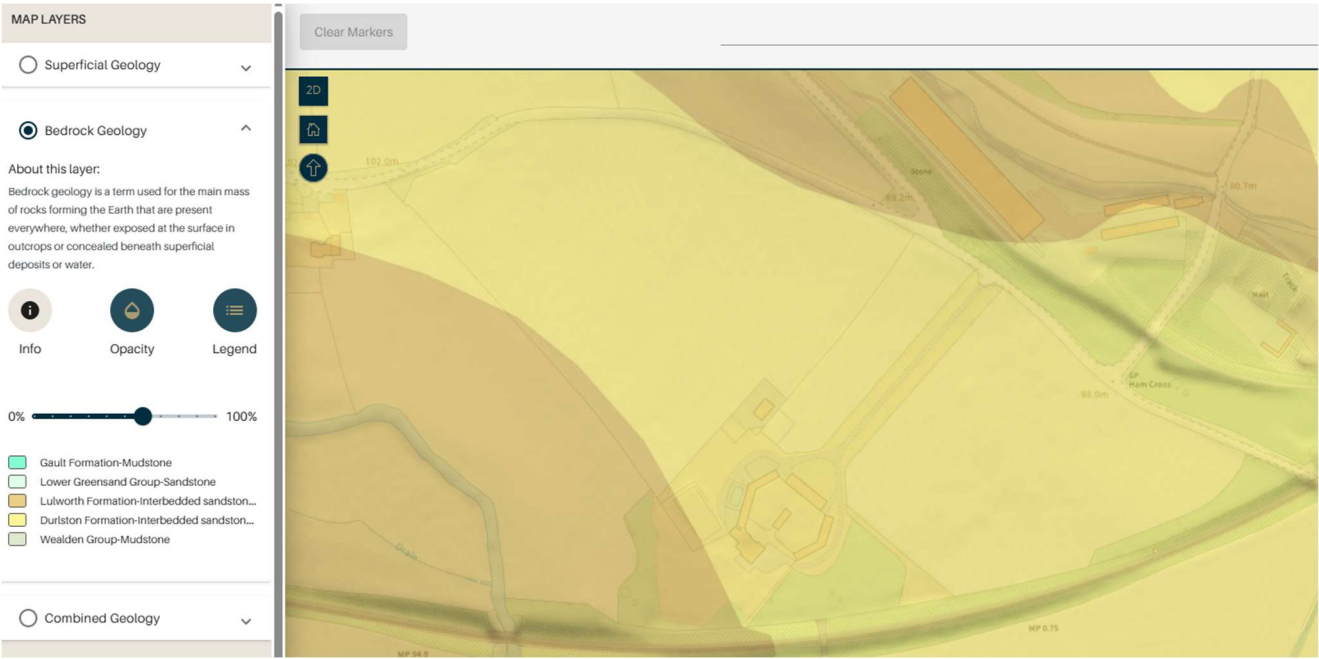


Fig.4 – Bedrock Geology (British Geological Society - geologyviewer.bgs.ac.uk)

4.1.1

Bedrock geology

Durlston Formation-Interbedded sandstone and [subequal/subordinate] limestone. These sedimentary rocks are fluvial, palustrine and shallow-marine in origin. They are detrital, forming deposits reflecting the channels, floodplains and deltas of a river in a coastal setting (with periodic inundation from the sea).

Minimum Age (Years):	139,400,000
Minimum Period:	Cretaceous
Maximum Age (Years):	145,000,000
Maximum Period:	Cretaceous

4.2 Superficial deposits

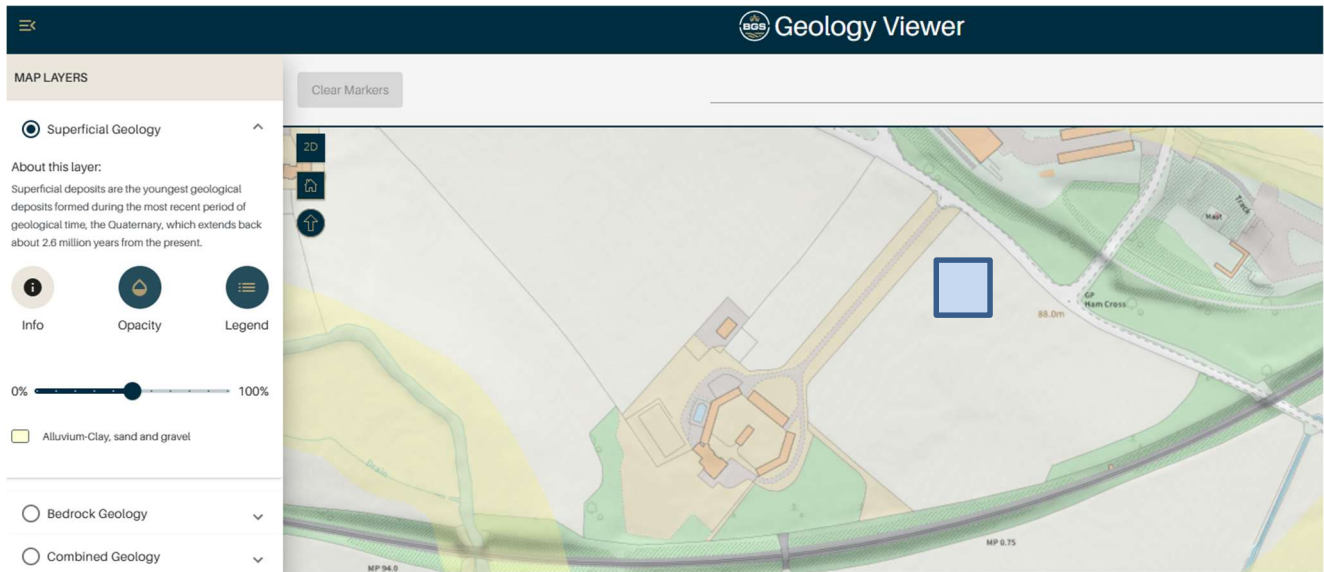


Fig.5 – Superficial Deposit (British Geological Society - geologyviewer.bgs.ac.uk)

4.2.1 Superficial deposits are not available within the site area however Alluvium-Clay, sand and gravel is recorded around the River Nadder.

5 Site Levels

A topographic survey (Fig.6) of the site shows the levels fall from high of 90.0m in the west to a low of 83.50m in the east.

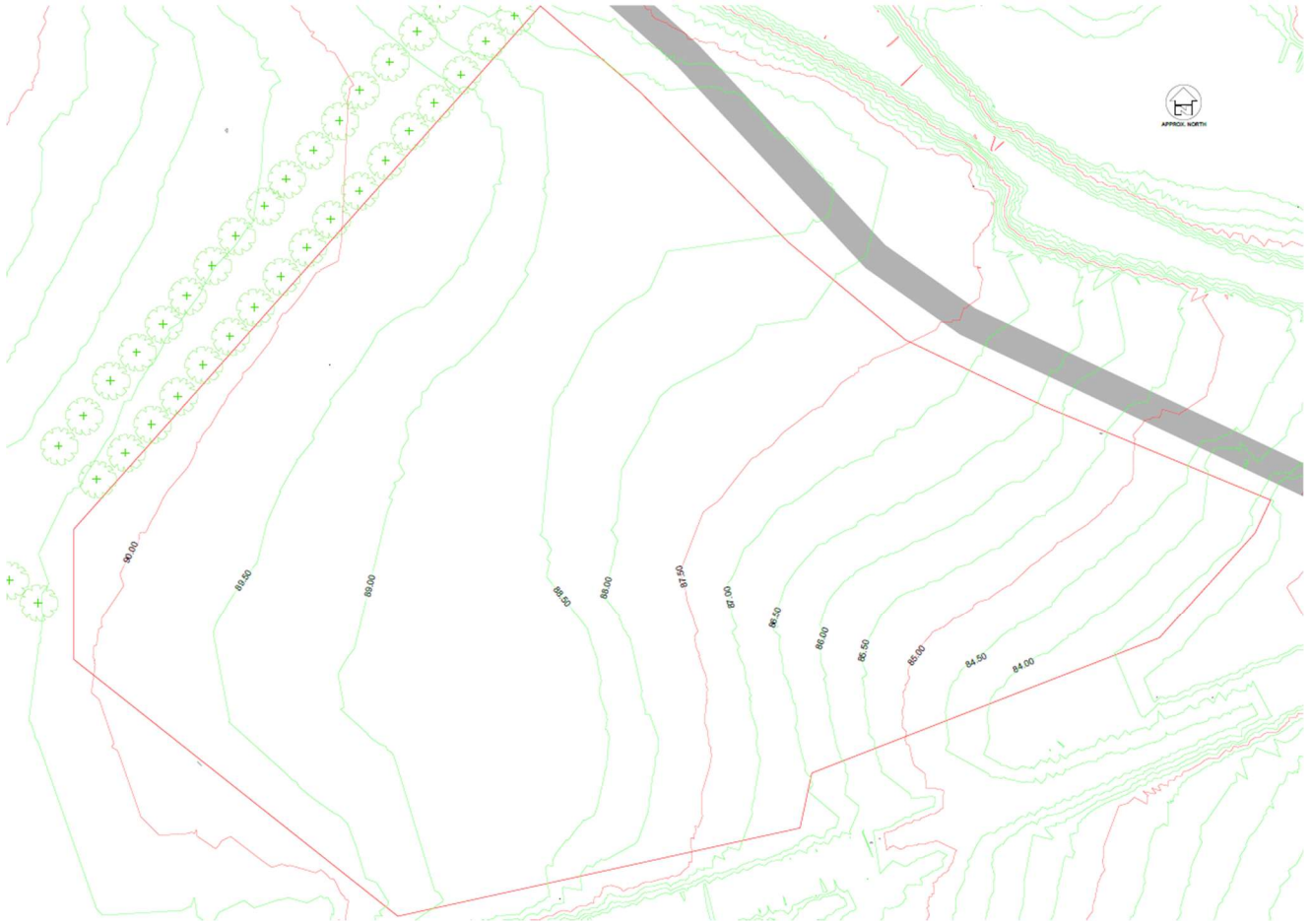


Fig.6 – Site Topography (Miles Water Engineering Drawing – See Appendix)

6 Main River Flooding

Surface water flooding refers to flooding caused when the intensity of rainfall, particularly in urban areas, can create run-off which temporarily overwhelms the capacity of the local drainage systems or does not infiltrate into the ground. The image below is an extract from the EA surface water flood map. It shows that the location of the proposed lake is outside the Flood Zones of the River Nadder.

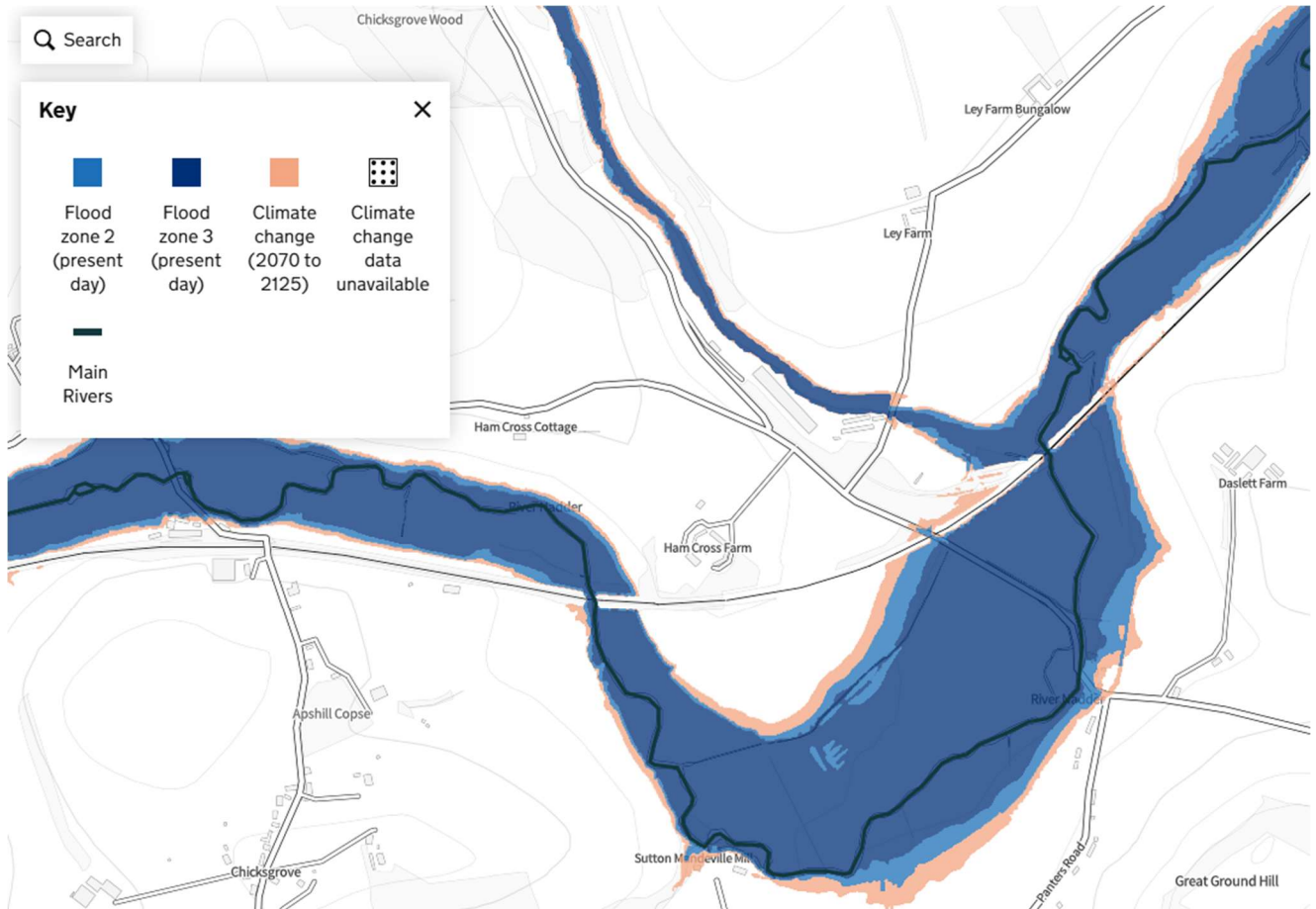


Fig.7 – EA – Flood Map - NTS

7 Groundwater

The DEFRA map (fig 11) shows the site is located in a high to medium-high groundwater vulnerability zone. The proposal for a new lake would not impact groundwater because:

- a) The lake has been positioned on the highest ground within the site boundary.
- b) The lake is lined and therefore there is no interaction or contamination between the water in the lake and the surrounding groundwater. The liner has a layer of geotextile underneath to prevent the liner from being punctured. The liner is typically a 1mm HDPE membrane or similar, and the geotextile is a 300gm/m², non-woven, needle-punched material or similar. A typical supplier of liner and geotextile is GSE Environmental. Their web site provides detailed specifications and appropriate usage for their materials.

<http://www.gseworld.com/products/geomembranes>

<http://www.gseworld.com/products/geotextiles>

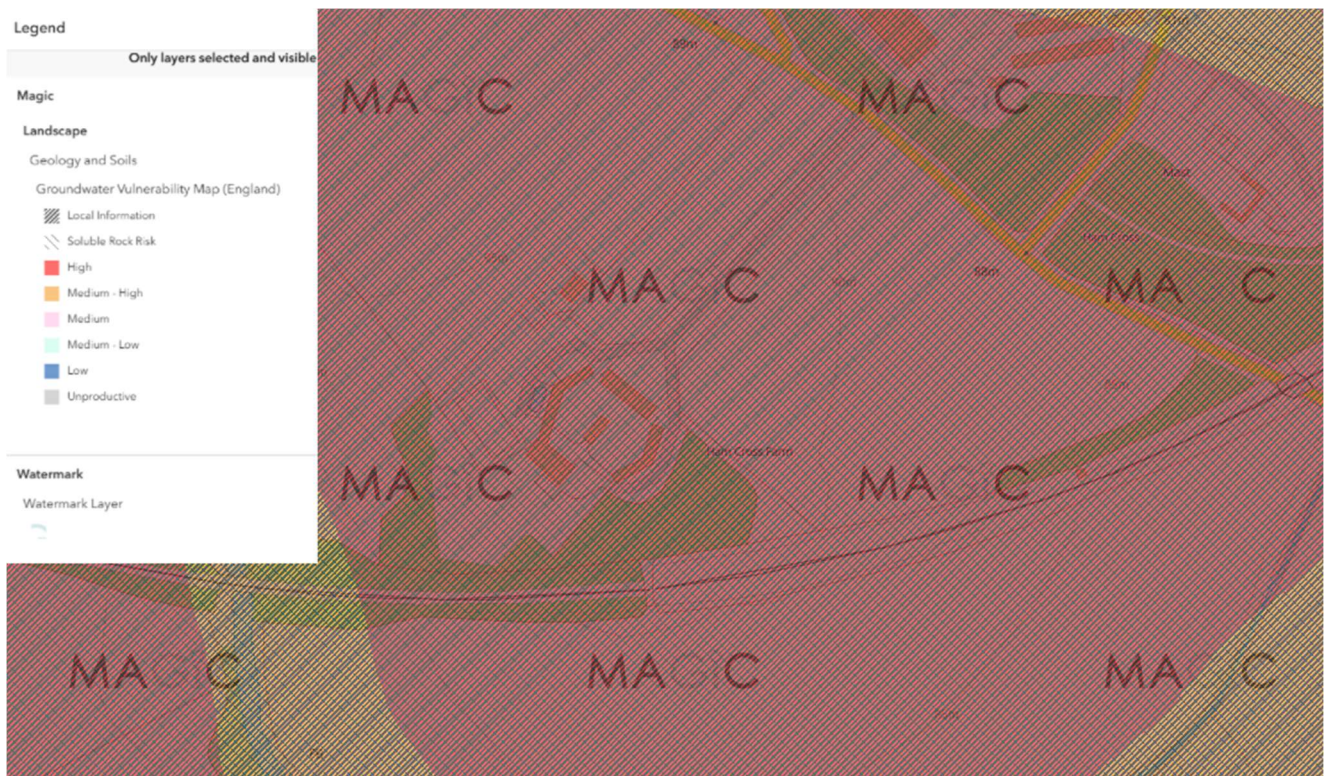


Fig.8 – The Groundwater Vulnerable Map (magic.defra.gov.uk)

8 Pumped Lake Design

The new conservation lake has been designed by Miles Water Engineering primarily to enhance biodiversity and landscape character. The lake has a footprint of approximately 2,035 Sq.m, a water surface area of approx.1080 Sq.m and with a maximum depth of 2.5m. The full design including reedbed/wetland has been included within the appendix.

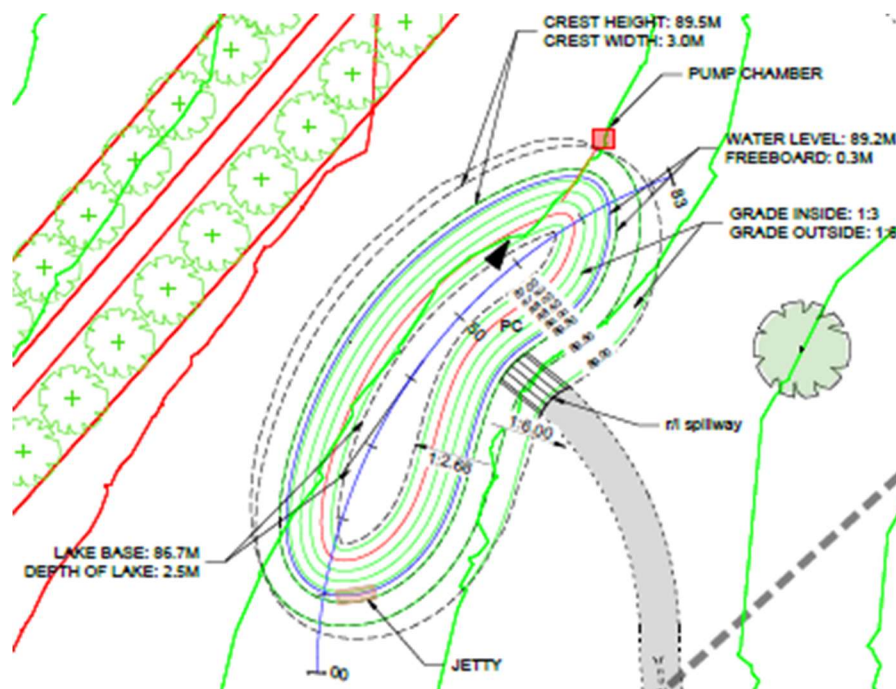


Fig.9 – Design Proposal (Miles Water Engineering Drawing – See Appendix)

8.1 Specification

The banks of the lake will be constructed to a high specification and no steeper than a 1:2.5 gradient providing bank safety and stability. Lake banks are to be constructed in 300mm lifts where applicable and compacted to 250mm, as required by the 1975 Reservoir Act. The majority of material cut is to form shallow sloped bunds, approx. 1.1m high along the North-East boundary running parallel with Chicks Grove Road. All excavated material is to be utilised in the construction of the lake banks or bunds and therefore no material is to be removed from site.

The lake has a total water volume of 1,622m³, below the 25,000m³ threshold and therefore falls outside the Reservoir Act.

Lake Description	Level / Quantity
Crest Level	89.50m
Crest Width	3.00m
Freeboard	0.30m
Max Water Level	89.20m
Base Of Lake	86.70m
Grade Inside	1:3
Grade Outside	1:6
Water Depth	2.50m

Water Volume Description	Level / Quantity
Total Water Volume	1,622m ³
Water volume above lowest ground Level	396m ³
Water volume below lowest ground Level	1226m ³
Lowest Ground Level	88.81m
Freeboard Water volume (between maximum water level and the crest level)	345m ³

8.2 Freeboard

In a storm event, there is additional water storage capacity held within the freeboard of the lake, this is the storage between the Water Level of 89.20m and the Crest Level of 89.50m. This 300mm freeboard will provide an additional 345m³ emergency water storage capacity.

8.3 Breach

The risk of an uncontrolled loss of water from the proposed lake is zero as there has never been a pumped reservoir breach in the UK.

Water Filling Strategy

8.4 Inflow

The lake is to be filled and the water level maintained via an on-site borehole and through surface water run-off and naturally occurring hydrological processes.

8.5 Overflow

If there is a surplus of water after heavy rainfall, and the water level in the lake rises above the max water level of 89.2m, it is to flow from the lake via a reinforced spillway into the bio-swale which terminates in the wetland approximately 150 metres to the South-East.

9 Maintenance

The maintenance of the lake and all the associated pipework and pumping mechanisms will be the responsibility of the landowner and will be cleared as and when required. It is within the interest of the owner to keep it clean and clear as a build-up of silt and debris etc will only reduce the capacity of the lake and the quality of the irrigation water.

10 Conclusion

1. The lake is not located within any of the flood zones of the River Nadder.
2. The water in the proposed lake does not interact with the existing groundwater because it is separated from the groundwater by a HDPE liner.
3. A pumped lake will not breach because there has never been a recorded incident of pumped reservoir breach in the UK.
4. Any discharge of water from the lake would flow:
 - a) into the bioswale and terminate in the wetland
 - b) SE following the same route as existing run off.
5. The freeboard provides an emergency storage of water after a heavy rainfall event. This emergency storage capacity is of 345m³.
6. There would be an overflow of water into the bioswale and terminate in the wetland if the outflow pumping system broke down and there was a major rainfall event.
7. The proposed lake falls outside the reservoir act and responsibility of its maintenance lies with the site owner.

11 Appendix



- Site Location Plan

