

# **Ravenswick Hall: Boating Lake Extension: Flood Risk Assessment**

**May 2021**

**[www.jbaconsulting.com](http://www.jbaconsulting.com)**



# Flood Risk Assessment

## Ravenswick Hall – Boating Lake Extension

Report reference: 2021s0242-RavenswickHall-FRA  
 Revision: 0002  
 Client: Ravenswick Hall  
 Date: May 2021  
 Authors: Ryan Jennings  
 Reviewer / Sign-off: David Mould

## 1 Introduction

### 1.1 Project background

JBA have been commissioned to undertake a Flood Risk Assessment to be submitted as part of the planning application for the extension of a new boating lake on the left-hand bank of the River Dove near Kirkbymoorside. The lake has an area of 13,879 m<sup>2</sup> or approximately 1.4 Ha which has been covered by the previous flood risk assessment. The emodification proposed to this lake is a 30m extension to the western boundary along with the creation of a privacy embankment to the East.

The location of the proposed lake is shown in Figure 1-1. A more detailed plan based upon the current landscape masterplan for the site (dated March 2021), which has accompanied the planning application, is provided as an Appendix.

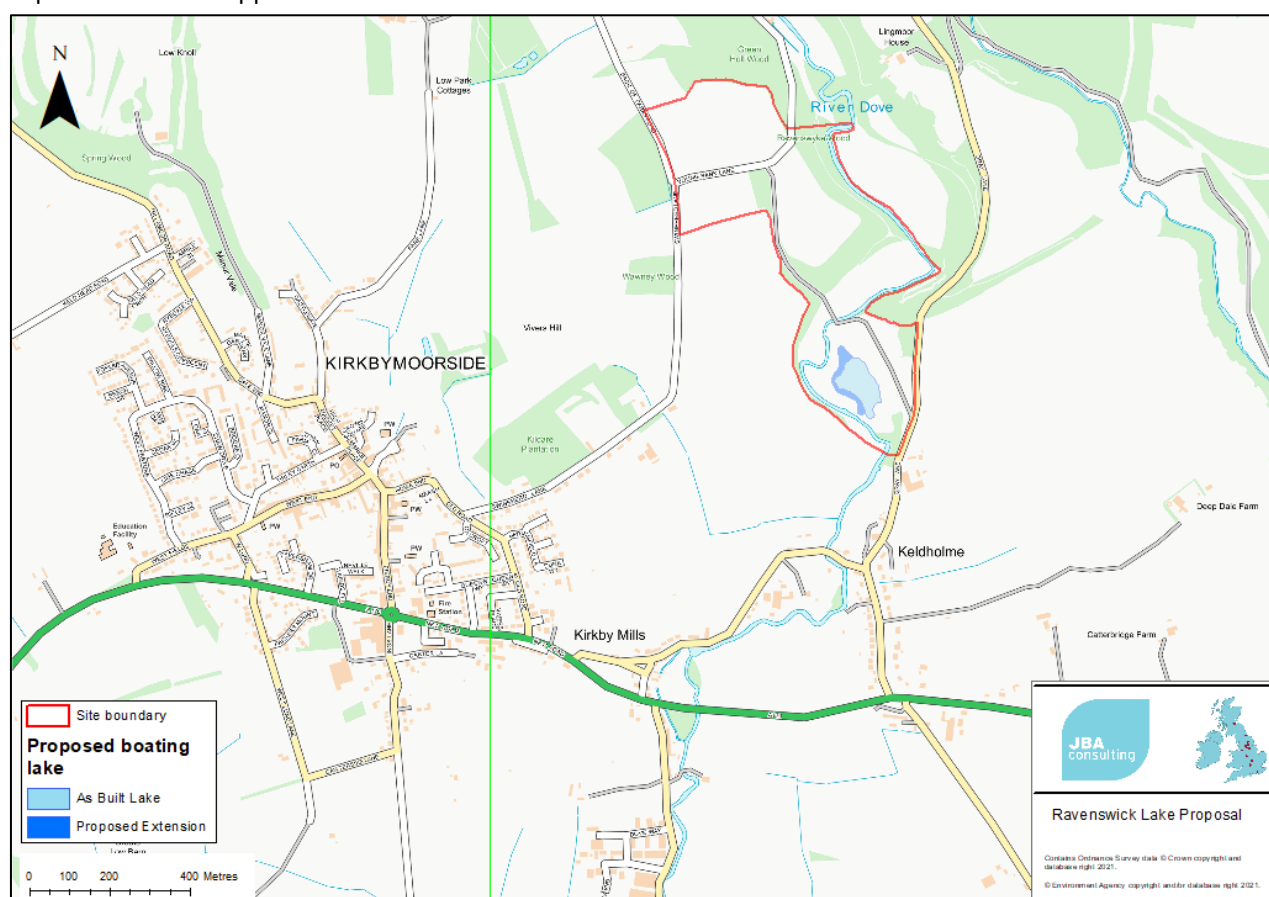


Figure 1-1: Proposed Boating Lake Location

### 1.2 Aims and Objectives

This report aims to identify the current flood risk associated within the local area surrounding the site. The proposed design will then be assessed to identify if this flood risk will be altered due to the planned extension.

The report structure is as follows:

- Description of the proposed development;
- Identification of existing flood risk at the site;
- The potential impact of the proposed lake;
- Access to the boating lake; and
- Provision of Flood Defences.

# Flood Risk Assessment

## Ravenswick Hall – Boating Lake Extension

Report reference: 2021s0242-RavenswickHall-FRA  
 Revision: 0002  
 Client: Ravenswick Hall  
 Date: May 2021  
 Authors: Ryan Jennings  
 Reviewer / Sign-off: David Mould

## 2 The Proposed Development

The proposed site construction is shown in Appendix 0 (A: SK-002 Lake Spoil Deposition). The proposed boating lake location is shown on Figure 1-1.

The proposed work is to extend the lake by 15m on the South/South Western edge and a 30m extension to the north. These extensions are towards the River Dove. In addition, an privacy embankment has been created to the East of the lake away from the flood zone using the spoil from the lake construction.



Figure 2-1: Work in progress, showing the lowered floodplain levels of the new lake (May 2021)

Under the previous planning application (APPN NO: 18/00622/MFUL) for the construction of the boating lake in 2018, a number of planning conditions were assigned. The Landscape Contractors that completed these works have confirmed the lake has been constructed to these conditions:

- The profile of the lake is as per the previous plan, as provided by Robinson Landscape Design Ltd 2018, with the 43 m above ordnance datum (AOD) contour representing the outline of the planned lake profile;
- The lake has been excavated down into the floodplain, with the base not extending through the entire thickness of superficial deposits which have been identified during site investigations as being present to depths of between 2.45 m and 3.45 m below ground level;
- The arising spoil generated during construction of the lake has been used in the landscaping of the house and main gardens (out of the flood zone) i.e. spoil generated during construction of the lake has not be deposited on the surrounding floodplain. It is also understood that there has been no importation of soil-based materials onto the floodplain to form the lake profile;

# Flood Risk Assessment

## Ravenswick Hall – Boating Lake Extension

Report reference: 2021s0242-RavenswickHall-FRA  
 Revision: 0002  
 Client: Ravenswick Hall  
 Date: May 2021  
 Authors: Ryan Jennings  
 Reviewer / Sign-off: David Mould

- It is assumed that lake water levels will be maintained at approximately 0.5 m below the level of the surrounding floodplain i.e. there will in effect be an increase in storage provided by the lake; and
- The proposed boating lake has been lined with clay.

The following assumptions have been made for the new proposed extension:

- The new extension to the lake will not be excavated any deeper than the current bed level of the lake and therefore will not extending through the entire thickness of superficial deposits.
- The privacy embankment will not raise any levels of the floodplain within flood zone 2 and 3.

It should be noted that the “floodplain” has been defined by the Environment Agency’s flood zone 2 outline. This does not include the lake as constructed. Areas deemed to be in flood zone 2 have been shown to have between 0.1% – 1% chance of flooding from rivers in any year (between 1:1000 and 1:100 chance). In the case of the River Dove at Ravenswick Lake, the flood zone 2 outline has been specified by a broad scale modelling. The identified flood zones therefore should be taken as indicative only due to the low-resolution data available. The actual active “floodplain” may be different. From the available LiDAR data, the flood zone 2 outline extends to between 44.8 and 45.0mAOD, whereas the flood zone 3 extends to between 44.1 and 44.5mAOD.

The current planned location of the privacy embankment is currently outside of these elevations, as per the plan shown in Appendix 0 (A: SK-002 Lake Spoil Deposition).

### 3 Existing Flood Risk

The table below summarises the existing flood risk for the site.

Table 3-1: Existing Flood Risk

Location	Description
Fluvial	<p>The EA flood map shows that much of the area where the proposed lake is to be located is at a Medium risk of flooding. This means that each year this area has a chance of flooding of between 1% and 3.3%. The site sits within Flood Zone 3. No properties are at risk in the immediate vicinity of the site.</p> <p>The river Dove at this location is dry for the majority of the summer months due to the local geology. After heavy rainfall the river flows as expected. This is captured in figure</p>



# Flood Risk Assessment

## Ravenswick Hall – Boating Lake Extension

Report reference: 2021s0242-RavenswickHall-FRA  
Revision: 0002  
Client: Ravenswick Hall  
Date: May 2021  
Authors: Ryan Jennings  
Reviewer / Sign-off: David Mould



Figure 3-1: River Dove at the lake site (April 2021)



Figure 3-2: River Dove at the lake site, after heavy rainfall (May 2021)

# Flood Risk Assessment

## Ravenswick Hall – Boating Lake Extension

Report reference: 2021s0242-RavenswickHall-FRA  
Revision: 0002  
Client: Ravenswick Hall  
Date: May 2021  
Authors: Ryan Jennings  
Reviewer / Sign-off: David Mould

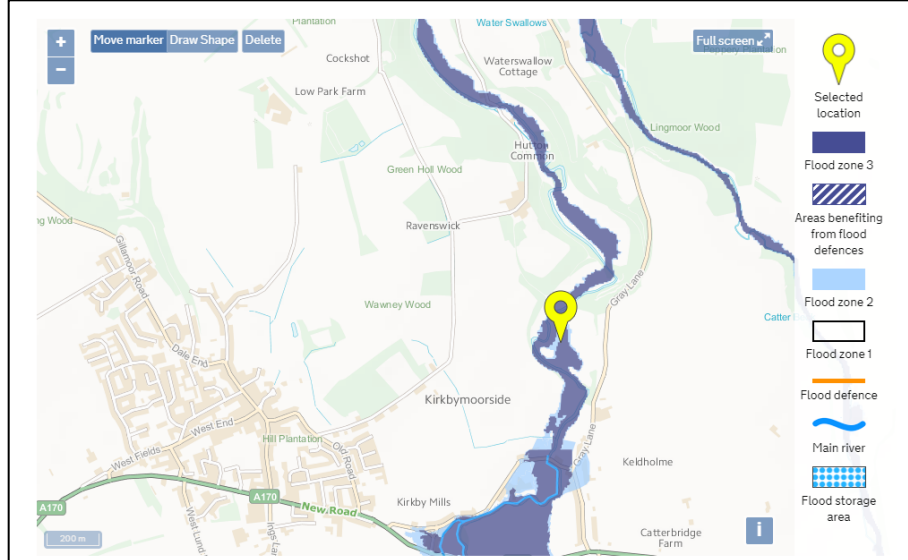


Figure 3-3: EA fluvial flood risk map

### Surface water

The EA surface water flood map shows that the area is largely free of surface water flood risk, apart from a small accumulation of water in the south east of the boating lake site. This area is at a High risk of flooding, meaning that each year this area has a chance of flooding of greater than 3.3%.

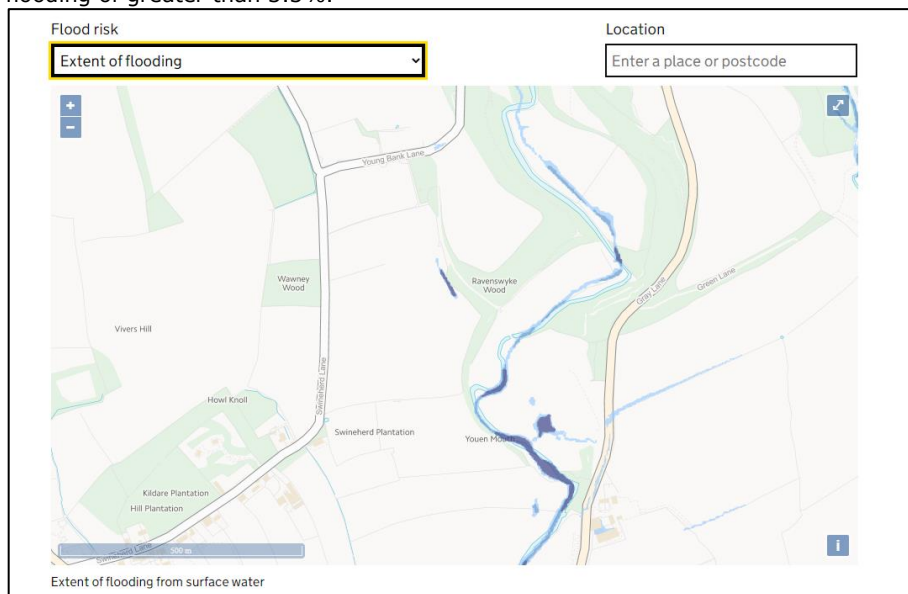


Figure 3-4: EA pluvial flood risk map

### Groundwater

Previous site investigations indicate that the area of the proposed lake is underlain by alluvial soils overlying limestone bedrock (Malton Oolite) at depths of between 2.5 m to 3.45 m. Local groundwater levels are anticipated to be within the limestone bedrock and controlled by (and evidenced by) a spring discharge known as Bog Hall Rising just to the south of the site. It is therefore unlikely that groundwater flooding represents a plausible flooding mechanism at the site.

An internet search revealed no flood history for the immediate site. However, there is a history of flood risk in the town of Kirkbymoorside and Kirkby Mills. The River Dove does not pass through the town of



# Flood Risk Assessment

## Ravenswick Hall – Boating Lake Extension

Report reference: 2021s0242-RavenswickHall-FRA  
 Revision: 0002  
 Client: Ravenswick Hall  
 Date: May 2021  
 Authors: Ryan Jennings  
 Reviewer / Sign-off: David Mould

Kirkbymoorside itself but does pass through Kirkby Mills. Waterproof boards were fitted to a number of properties in Kirkby Mills in 2011 following flash flooding from the Dove in 2010<sup>1</sup>. In addition, there was additional flooding to properties in Kirkby Mills during February 2021.

#### 4 Flood Risk Assessment

The potential impact of the proposed lake on each of the three flood risk mechanisms is explored in the table below.

Location	Description
Fluvial	<p>The western extension into the floodplain may encourage a greater quantity of flows into the lake during a flood (see Appendix), this should aid the lake/river interaction and encourage floodplain storage within a flood event. If anything, this should marginally decrease fluvial flood risk downstream of the works.</p> <p>The plans also include a privacy embankment made from the spoil deposition of the lake. All of the spoil is to be deposited outside of flood zone 2 and therefore should not increase fluvial flood risk either upstream or downstream of the site.</p> <p>The definition of the flood zone 2 outline has been outlined in Section 2 (The Proposed Development) and should be used as reference.</p>
Surface water	<p>Whilst the pond will be lined with an impermeable lining of Clay, a proposed (0.5 m) freeboard between the water level and the floodplain will provide ample storage for rainfall and surface water storage. It is assumed this will be maintained within this new proposal. The area is largely free of surface water flood risk.</p>
Groundwater	<p>Groundwater beneath the site flows through the Malton Oolite and discharges from Bogg Hall Spring Head (NGR 470900 486500), downstream of the study site. Recent investigations have not identified a water table within the superficial deposits beneath the footprint of the proposed lake and it is not planned to extend the base of the lake through the entire thickness of superficial deposits.</p> <p>For significant portions of the year the channel of the River Dove near the lake is dry, as flow is lost in a series of sinks (where water is lost to the underlying limestone) beneath the River Dove near Yoadwath Sinks (NGR 470800 487500), just downstream from Yoadwath Mill trout farm. It is therefore unlikely that groundwater flooding represents a plausible flooding mechanism at the site.</p>

In summary, the westerly extension to the boating lake should not impact on fluvial flood risk even within the flood zone 3 boundary. It is likely to encourage the lake/river interaction and encourage floodplain storage within a flood.

The construction of the privacy embankment to the east of the feature is outside of the flood zone 2 boundary. The Landscape contractor has confirmed that the construction lead too any raising of land within the flood zone elevation and therefore will not increase flood risk.

There is a negligible risk from either surface water or groundwater flooding from the development.

<sup>1</sup> <http://www.bbc.co.uk/news/uk-england-york-north-yorkshire-18071286>

<sup>2</sup> [http://www.gazetteherald.co.uk/news/8799527.Kirkbymoorside\\_residents\\_demand\\_action\\_on\\_flooding/](http://www.gazetteherald.co.uk/news/8799527.Kirkbymoorside_residents_demand_action_on_flooding/)

# Flood Risk Assessment

## Ravenswick Hall – Boating Lake Extension

Report reference: 2021s0242-RavenswickHall-FRA  
 Revision: 0002  
 Client: Ravenswick Hall  
 Date: May 2021  
 Authors: Ryan Jennings  
 Reviewer / Sign-off: David Mould

### 4.1 Mitigation: Access and Egress

As the proposed boating lake is located within Flood Zone 3, the safety of users of the lake is of importance. An evacuation plan should be put in place and the lake should not be used if flood warnings are in force for the watercourse. This should be clearly displayed on a sign on the lakeside. The owner of the property should sign up to the Environment Agency flood warning service as part of that evacuation plan.

### 4.2 Flood Defence Consent / EPR

In the area of the proposed development, the River Dove is not main river and so a Flood Defence Consent will be required from the North Yorkshire County Council (NYCC) (who are the Lead Drainage Authority for ordinary watercourses within their district) for any works within 8 m of the watercourse. NYCC will have a statutory 8-week period to approve or withhold consent and the cost will be in line with their current charging scheme. Separate consents may be required for both temporary and permanent works.





## Appendices

### A: SK-002 Lake Spoil Deposition (Also supplied as separate PDF)

