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St Nicholas Primary School

Flood Consequence Assessment

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P01

DOCUMENT CONTROL SHEET

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CONTENTS

Appendices

1.0 INTRODUCTION

- RVW Consulting Limited has been commissioned by ISG to undertake a Flood Consequence Assessment (FCA) for the development of existing St Nicholas School in St Nicholas.

Figure 1. Site Location Map.

- The Development Advice Map, presented on the NRW website, shows that the entire site is located within DAM Sone A. Areas located in DAM Sona A are classified as being at little or not risk of fluvial or coastal/tidal flooding. As the risk flooding from rivers or seas is classified as low, the principal consideration of this FCA is surface water management.

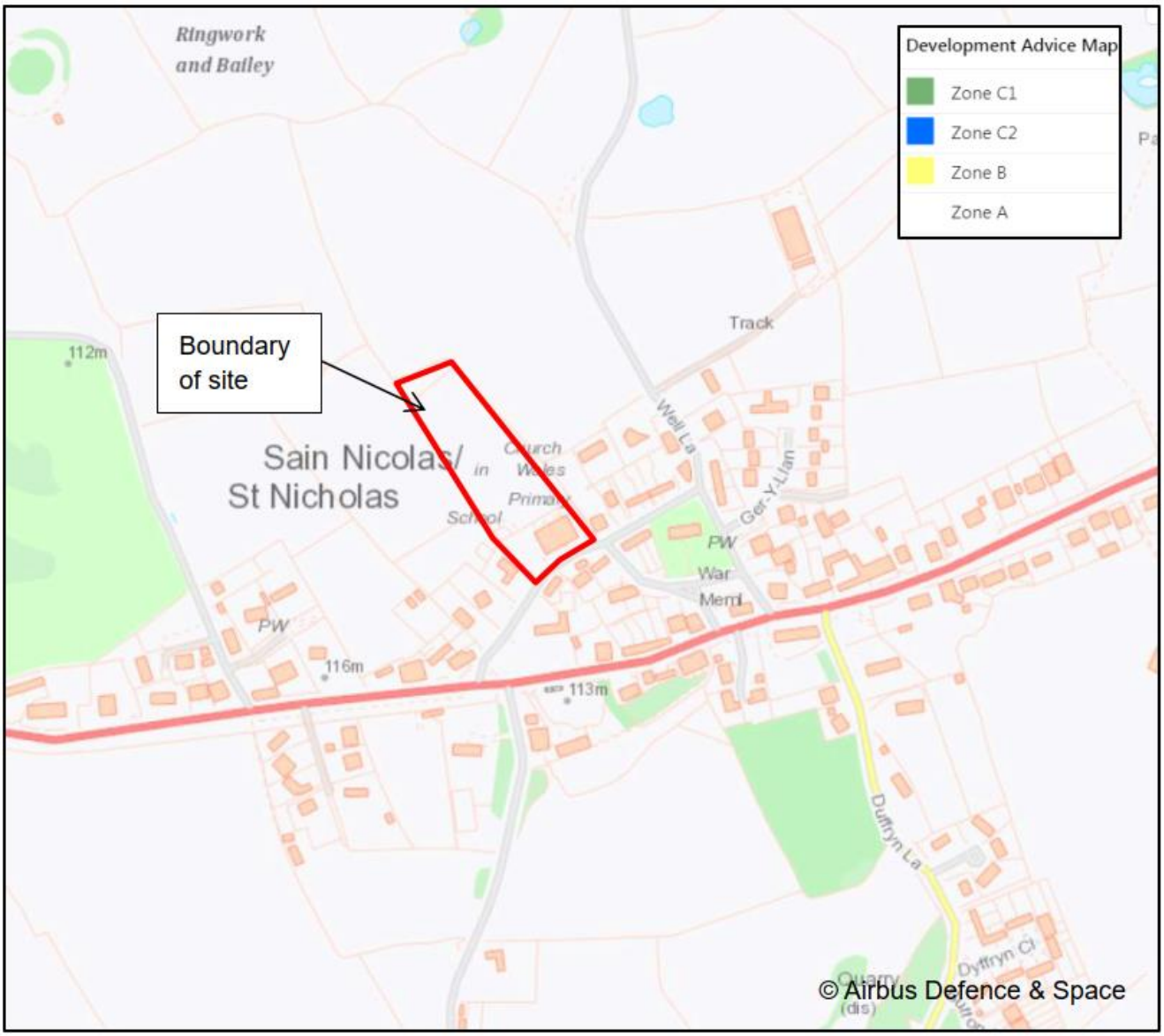

Figure 2. Natural Resources Wales Flood Map.

- This FCA report has been prepared broadly in line with the recommendations set out in Technical Advice Note 15 (TAN 15): Development and Flood Risk. The Welsh Government's accompanying TAN15 DAMs, alongside the NRW flood maps have also been used to inform this assessment. As the development is situated within DAM Zone A, a justification test is not applicable.

2.0 OVERVIEW

- The proposed development is to replace the existing Primary School. The new school will be for 126 pupils and 12 nursery places and will include play and sports areas in the existing site.
  Where possible surface water will be designed to replicate natural ground. Excess surface water will be attenuated and connected to the highway surface water drains.

3.0 TIDAL/FLUVIAL

As discussed in Section 1, the Proposed Development is located within DAM Zone A, which are areas classified as having little or no risk of tidal/ fluvial flooding. Given the DAM Zone designation, the level of the site and distance from the coast, tidal and fluvial flood risk are considered to be very low.

4.0 SURFACE WATER

Overland flow routes can form from rainfall that fails to infiltrate the surface and travels over ground; this is exacerbated where the permeability of the ground is low due to the type of soil/ geology (such as clayey soils) or urban development. Surface water is also promoted in areas of steep topography which can rapidly convey water that has failed to penetrate the surface.
Figure 3 below shows NRW's Surface Water Flood Risk Map. The dark orange shading (high risk) shows areas that have a chance of flooding of greater than 3.33% Annual Exceedance Probability (AEP).
The light orange shading (medium risk) shows areas that have a chance of flooding between 1% AEP and 3.33% AEP. The yellow shading (low risk) shows areas that have a chance of flooding between 0.1% AEP and 1% AEP.
According to NRW's Surface Water Flood Risk Map, the majority of the site is not considered to be at risk from surface water flooding. A small section of the site at the north east end is shown to be at low risk (existing pond).
Overall it is considered that the flood risk from surface water is low at the Proposed Development site.

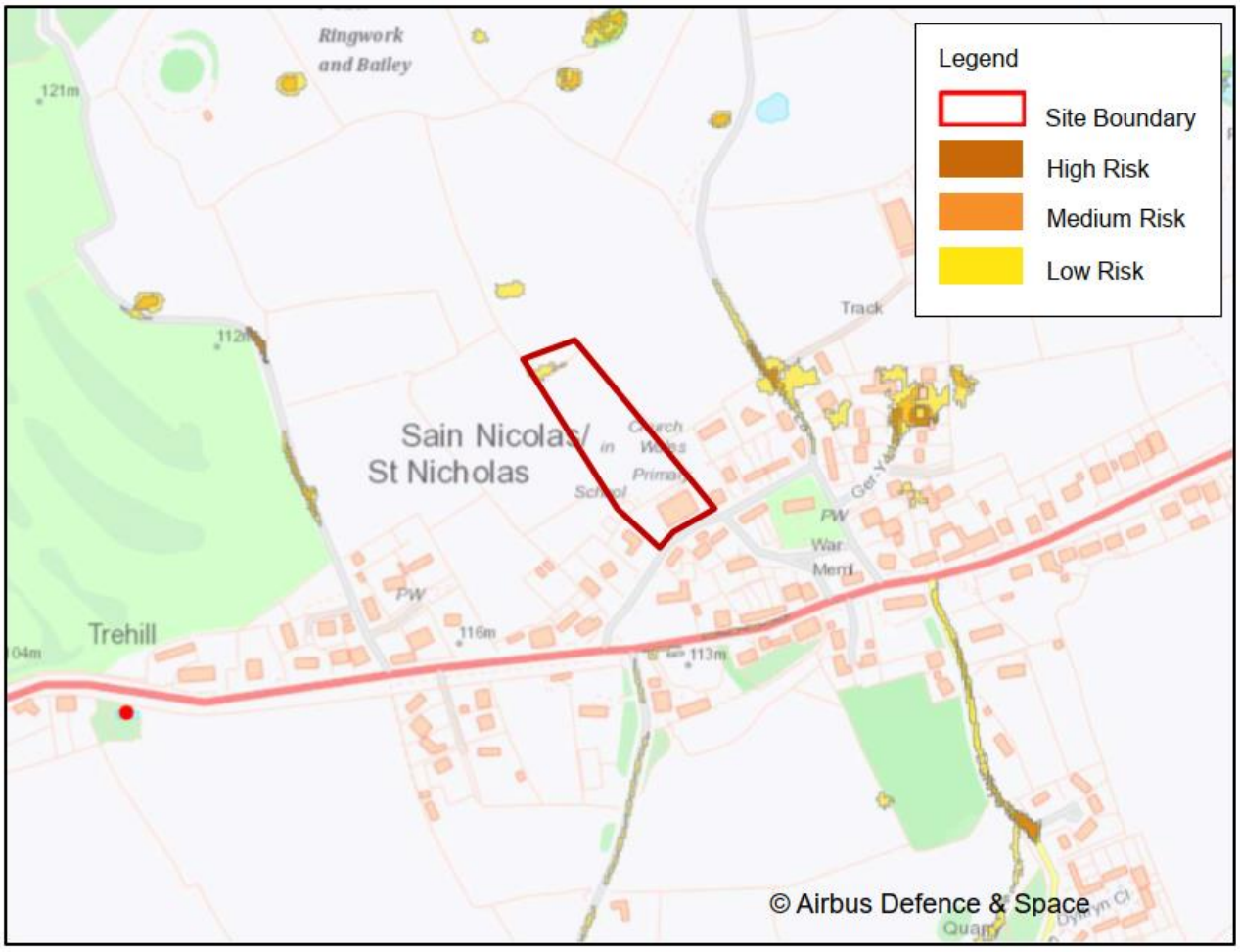

Figure 3. Flood Map for Surface Water.

5.0 GROUNDWATER

Groundwater flooding occurs where groundwater levels rise above ground surface levels. The geology has a major influence on where this type of flooding takes place; it is most likely to occur in low-lying areas underlain by permeable rocks.

The bedrock is Limestone and the superficial deposits are Till. Limestone has a low infiltration rate, however depending on its formation it can be quite permeable if it is caustic or has fissures. In addition, artesian springs may occur however these are more likely to occur in lower lying areas.

The site is on an area of high ground, the ground slopes away to the north and west of the site. If any groundwater flooding was to occur there are flow paths to take the water away from the site.

DEFRA's Magic Map shows that the site is within a Principal Aquifer. These are considered to be "layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. This may support water supply and/or river base flow on a strategic scale."

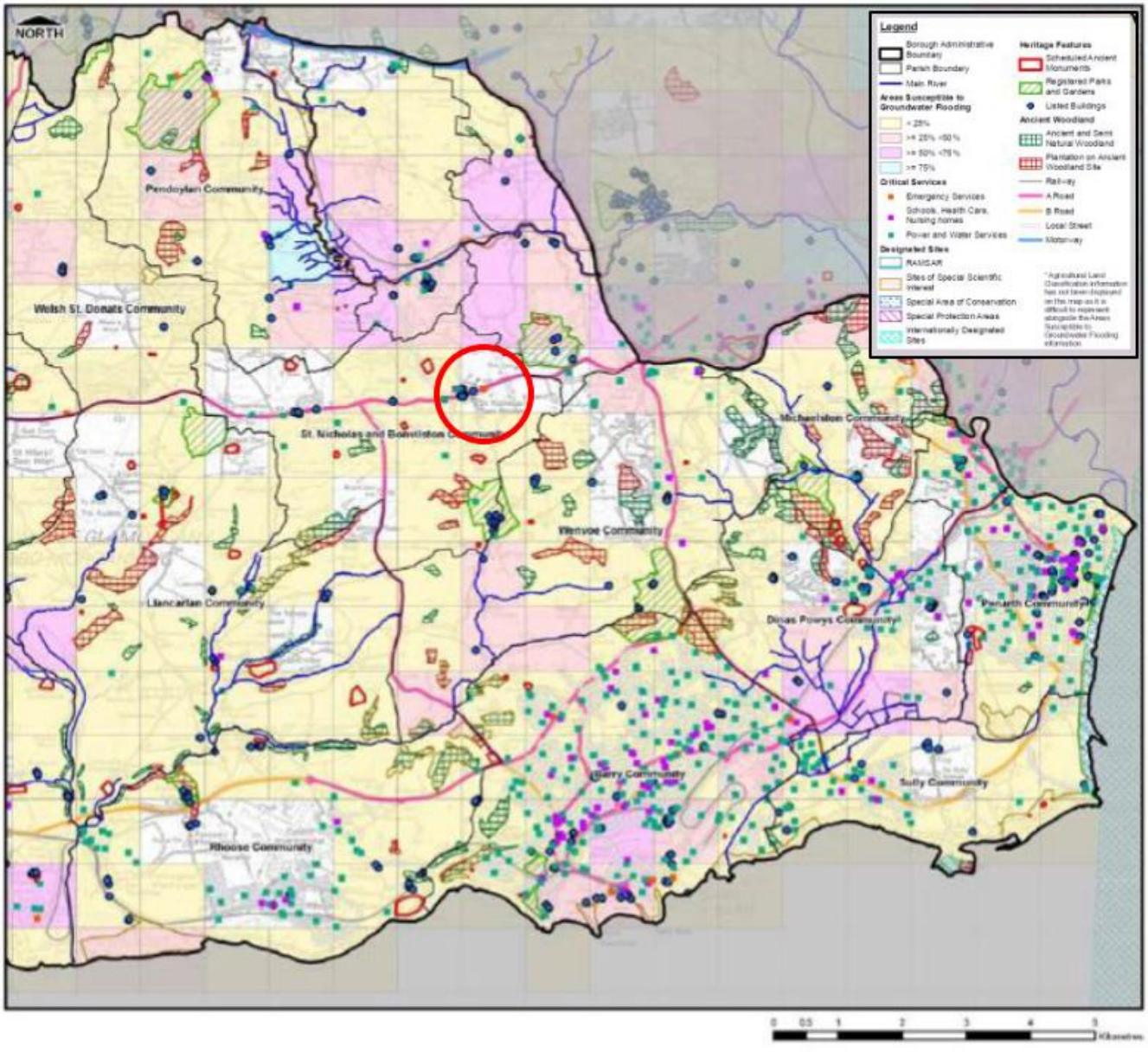

Figure 4. Area susceptible to groundwater flooding.

According to the Area Susceptible to Groundwater Flooding map (Figure 4), the school is in an area where there is no data available.
No ground water flooding incident data was made available at the time of writing the FCA.
Based on the topography of the site the risk from groundwater is considered to be low.

6.0 SEWERS

Flooding can occur as a result of infrastructure failure e.g. blocked sewers or failed pumping stations.
Sewer flooding can occur when the system surcharges due to the volume or intensity of rainfall exceeding the capacity of the sewer, or if the system becomes blocked by debris or sediment.
No sewer flooding records were made available at the time of writing this FCA.
The public sewer records (presented in Figure 5) show that there are two foul sewer manholes near the school. One north and one south but both between approximately 10 and 30m from the site. These are the upstream ends of the sewers, and the sewers flow away from the site. In addition, if sewer flooding did occur, the topography around the school indicates that sewage would flow away from the site not into it.
For these reasons the flood risk from sewers is considered to be low.

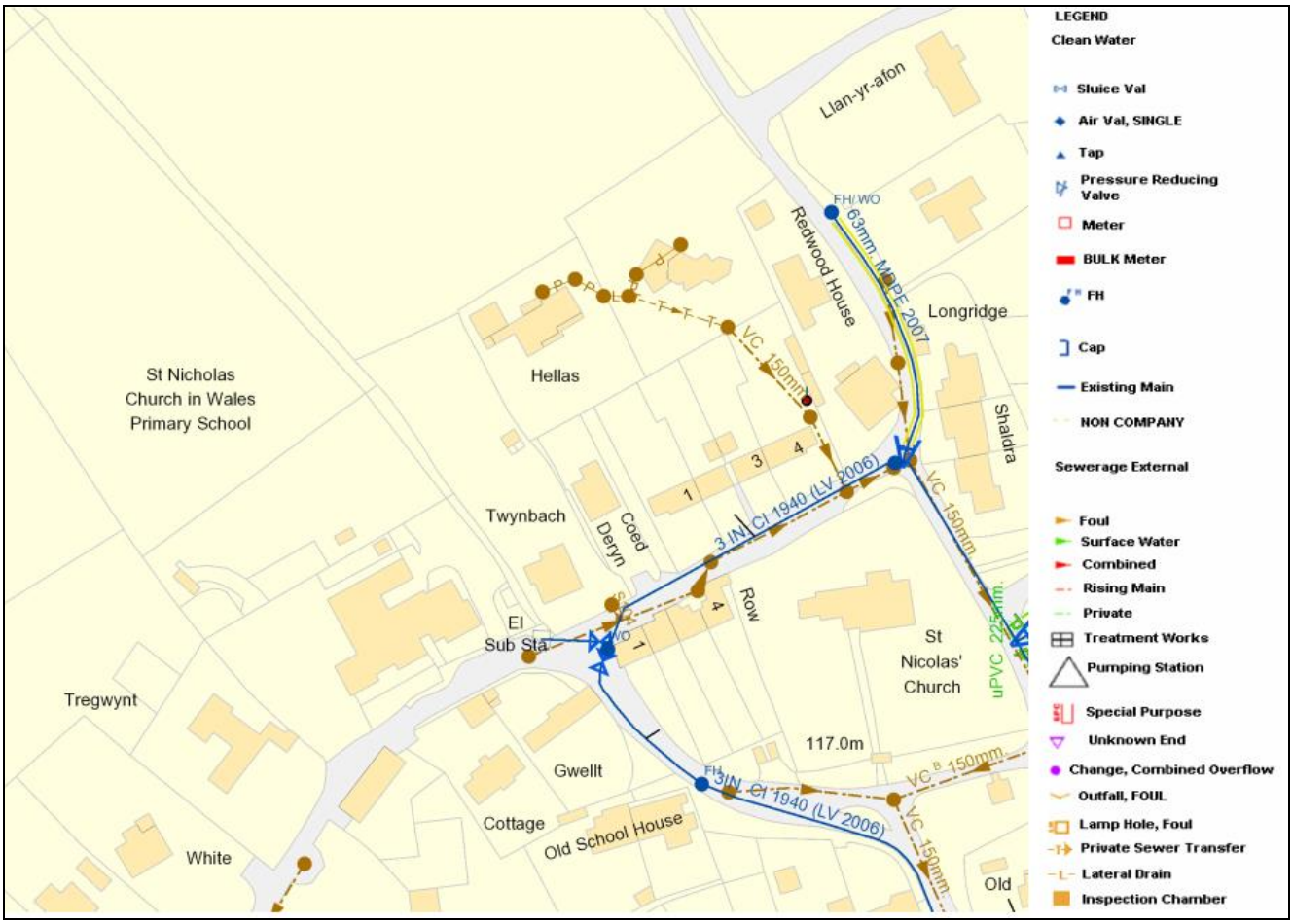

Figure 5. Public sewer records.

7.0 ARTIFICIAL SOURCES

Artificial flood sources include raised channels such as canals or storage features such as ponds and reservoirs.

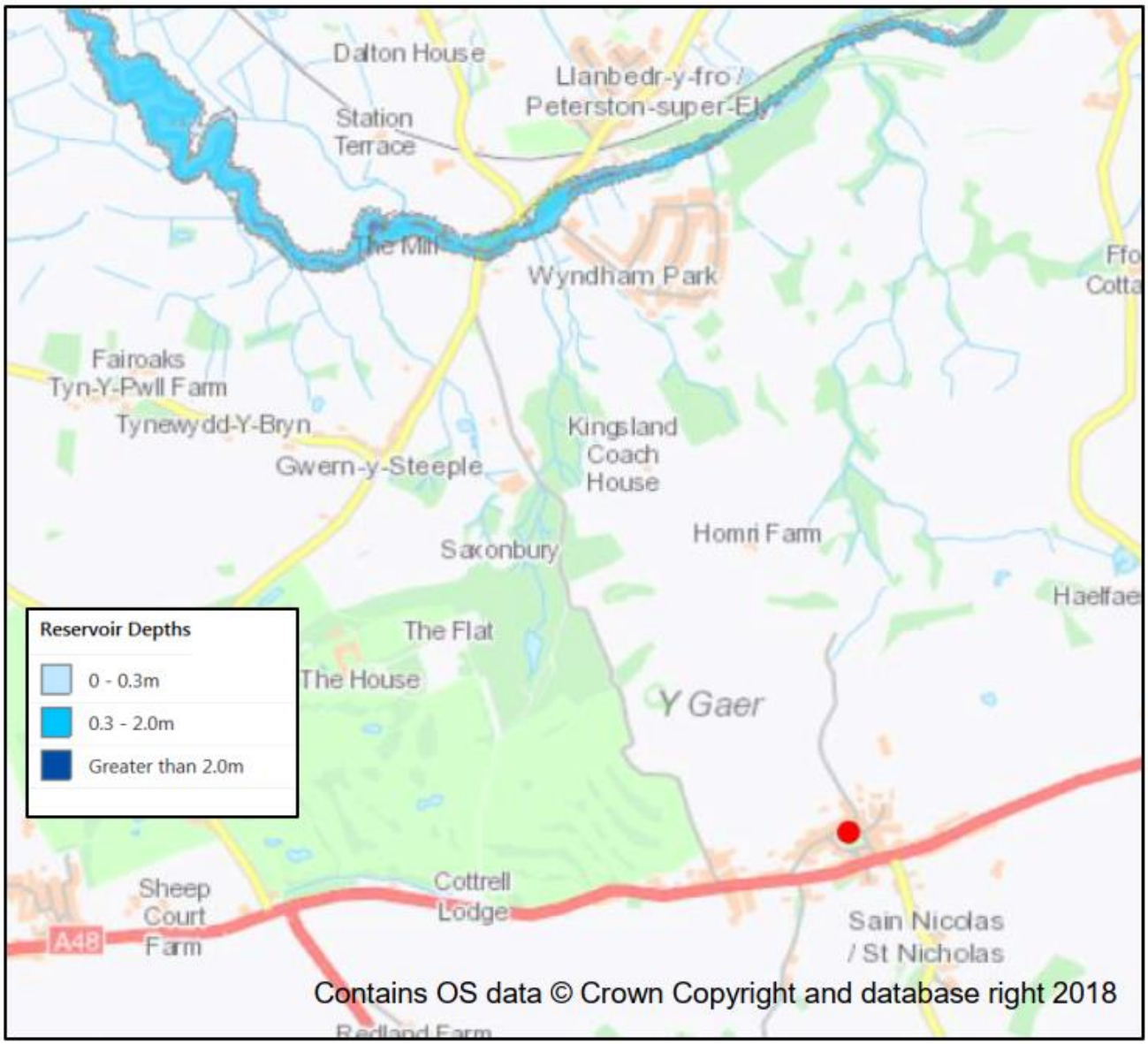

Figure 6. Reservoir Flood Risk Mapping.

There are a few small ponds within 2.5km of the development site; the largest is adjacent to the Nant Y Drope river about 2.3km away from the development site. The ponds are not considered to be of sufficient size to pose a risk to the site. In addition, in the event of a breach, water would flow away from the proposed site.

The NRW Flood Risk from Reservoirs Map (Figure 6) indicates that the nearest reservoir flooding extents are approximately 1.9km north west of the Proposed Development. The flooding stems from Hensol Lake approximately 6.3km north west of the Proposed Development.

Due to the distance from the reservoir flooding extents and flow path direction from the smaller ponds, the risk from artificial sources is considered to be very low.

8.0 SUMMARY OF FLOOD RISK TO THE DEVELOPMENT

The flood risk to the development is summarised in Table 1 below.

Type of Flooding	Source of Flooding	Existing Flood Risk
Fluvial and Tidal	None	Very Low
Surface Water	Runoff from surrounding land	Low
Sewers	Surrounding public drainage system	Low
Groundwater	Underlying geology and groundwater levels	Low
Artificial Sources	None	Very Low

Table 1. Summary of Existing Flood Risk.

Appendix A – Drainage Layout