

Emm Brook Pond: Drainage Statement and Flood Risk Assessment

Version 1.0

Background

The South East Rivers Trust (SERT) is a registered charity (no. 1091000) whose objectives include the improvement of the physical and natural environment of the South East of England. SERT aims to make rivers thrive again for local communities and nature.

At Riverside Park, Woosehill, Wokingham, SERT plan to reconnect a 340-metre length of historic river channel of the Emm Brook to bypass the existing weir (planning app. 203617). As part of this wider programme of works SERT propose creating a new wildlife pond at SU 79922 68966. This will act as mitigation for the loss of the existing pond at SU 79920 69100 that sits within the paleo channel that will be reconnected to the main flow of the Emm Brook.

Drainage Statement

The location for the new proposed pond sits within a depression that becomes temporarily waterlogged during times of high rainfall making it a favourable site to create a pond. This area is not currently connected to any surface water drainage networks or known subsurface land drains (*utilities check and site walkover check*).



Figure 1: Area of new proposed pond. Note exposed damp soil on the right of the picture. This is where small puddles form during periods of high rainfall.

The pond will measure 163m², have a maximum depth of 1.5m (mean maximum water depth expected to be lower than this), and involve the excavation of ~100m³ of material (figure 2). The pond will not be bunded, with all excavated material being removed from site, so there is no risk of the banks breaching. The pond will be naturally lined with the existing clay on site, and it will be predominantly fed by ground water infiltration and rainwater as it sits within a shallow low-lying natural depression. No new surface water or groundwater connections will be created.

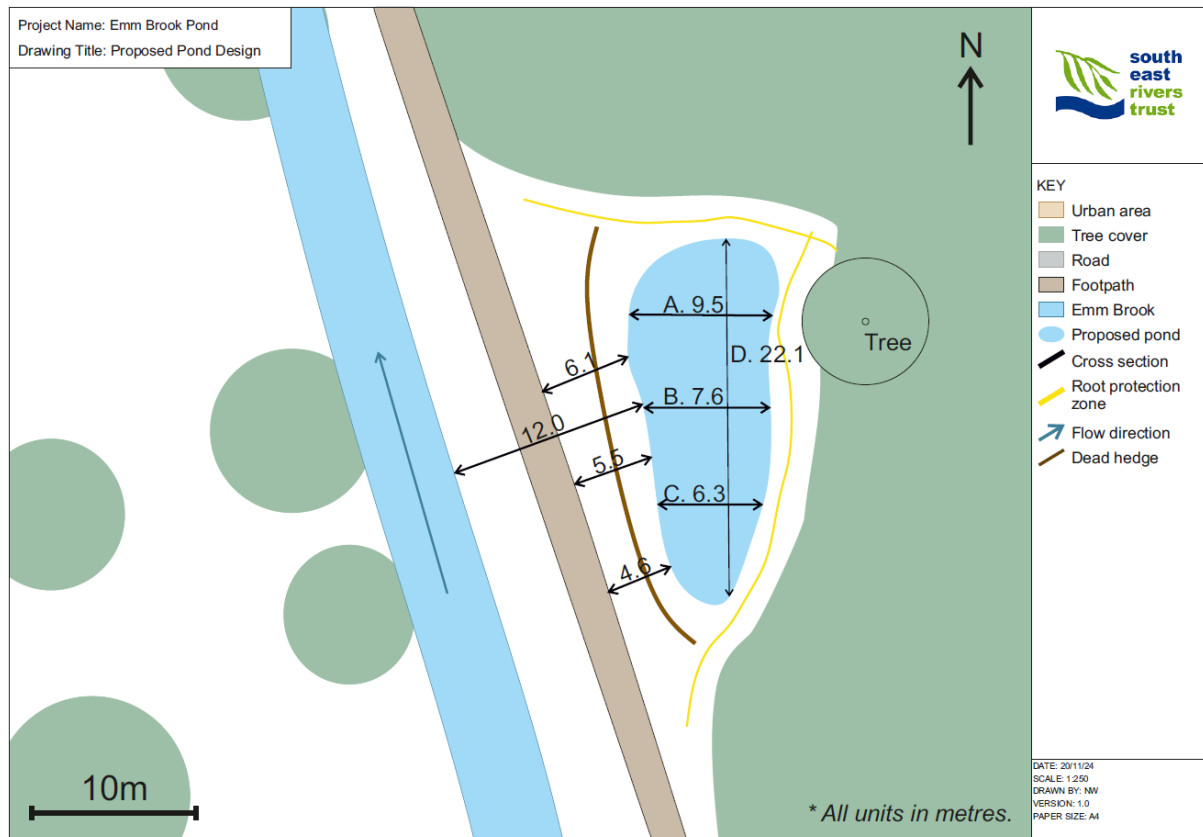


Figure 2: Dimensions of the proposed Emm Brook pond.

Flood Risk Assessment

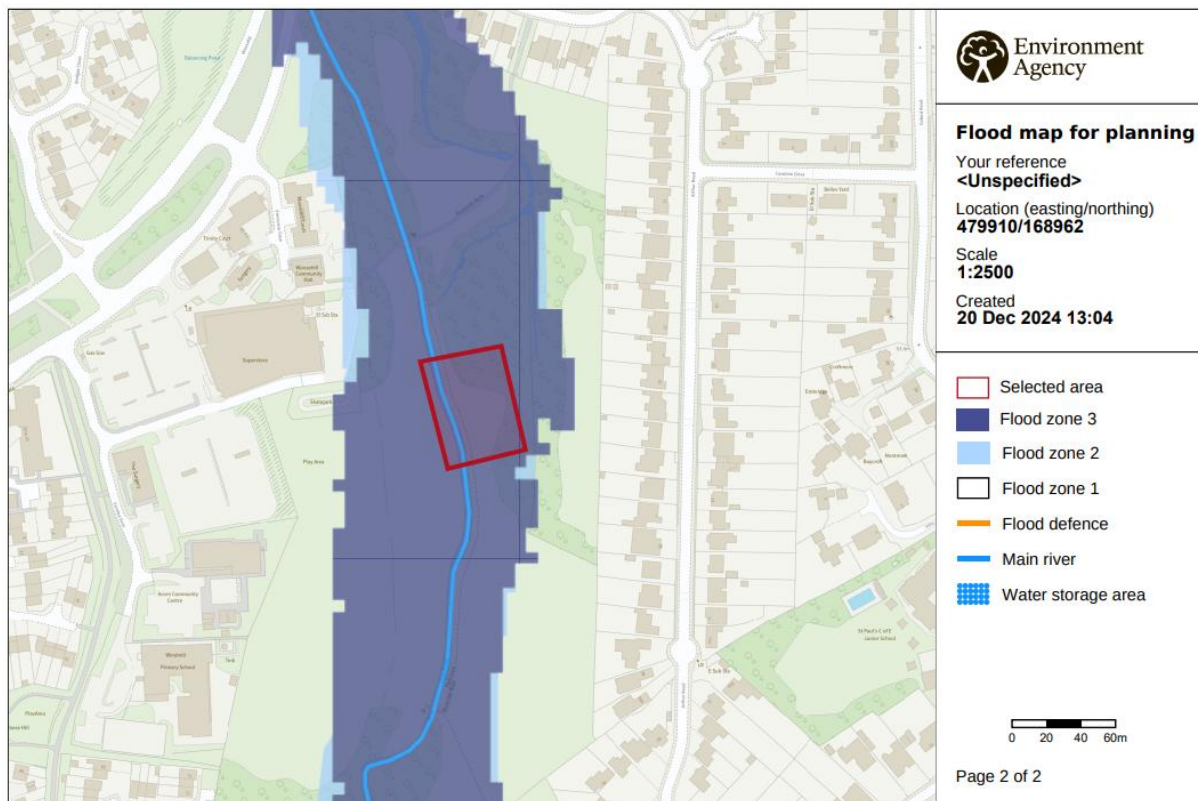
This Flood Risk Assessment forms part of the proposed plans to create a new wildlife pond at SU 79922 68966. This will act as mitigation for the loss of the existing pond at SU 79920 69100.

In this document, we provide evidence that our proposed intervention does not increase flood risk for properties and infrastructure in the wider area. Potential receptors will be identified and any risks to these receptors will be determined, based on the information provided through the Environment Agency's flood risk mapping service. Mitigation against these determined risks will then be explained, in addition to the actions to be taken during and after construction to ensure that these risks are managed appropriately.

Fluvial & Tidal Flooding

1. Within the site boundary there are no properties currently situated within either Flood Zone 3 or 2. The nearest properties situated within Flood Zone 3 are ~650m upstream and ~300m downstream of the project area.

2. The location of the proposed new pond is 12m away from the Emm Brook. No work will take place within the Emm Brook channel, but the main work area sits within Flood Zone 3.
3. Within the site boundary there are no roads currently situated within either Flood Zone 3 or 2. The Whoosehill Spine Road is in Flood Zone 3 250m away from the proposed pond location.
4. The Greenway is located in the project area in Flood Zone 3 and is 5m away from the proposed pond location.



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Figure 3: Floodmap for planning for the proposed pond location.

Ground Water Flood Risk

Groundwater flooding is caused by groundwater rising through permeable geology and escaping due to sustained periods of higher than average rainfall or a reduction in abstraction for water supply.

The presence of shallow groundwater may be as a result of a permeable superficial geology over an impermeable bedrock geology.

Groundwater flooding can result in a prolonged period of flooding, especially where the topography prevents floodwater from flowing over the surface.

The bedrock covering the site consists of “rocks with essentially no groundwater” with a “clayey sequence up to 140m deep” as shown by the BGS Hydrogeology dataset. The clay is slowly permeable and seasonally wet and therefore is able to hold surface water at surface over long durations.

Groundwater flooding is not expected to pose a risk on the site, however due to the geology and the topography, it is likely that depressions within the clay would hold onto surface water.

Surface Water Flood Risk

The extent of flooding shown within the 'Risk of Flooding from Surface Water' mapping has been reviewed, as shown in Figure 4.

The mapping shows the area of the proposed pond to be situated within an area deemed to be at 'high risk' from surface water flooding. This indicates a probability of surface water flooding greater than 3.3% in any given year.



Figure 4: Risk of flooding from surface water.

Reservoir Flood Risk

The site is not shown to be situated in an area affected by reservoir flooding (<https://check-long-term-flood-risk.service.gov.uk/risk#>).

Sewage Flood Risk

A utilities search carried out for the site in March 2019 identifies the presence of a Foul sewer 60m north (downstream) of the site. This is in the ownership of Thames Water. No other sewers have been identified immediately upstream of the site or within the study area.

Due to the lack of sewer infrastructure upstream of the proposed pond area, it is deemed that there is a very low risk of flooding from sewers.

Risks

Reduction of floodplain capacity: Any groundworks taking place within the floodplain have the potential to reduce floodplain capacity and increase flood risk.

Breach of pond banks: If a pond bank collapses, or breaches there is the potential for any water held within the pond to create localised flooding.

Sediment ingress into the Emm Brook during and immediately post construction: Due to the proximity of the project to the Emm Brook the recently exposed bare earth could increase sediment ingress into the Emm Brook in times of flood, reducing channel capacity during peak flows.

Catastrophic blockages – (rapid) increase of water levels at peak flows: Any logs or other parts of the dead hedge that could become dislodged during floods. There is the potential dislodged material could cause a blockage on bridges and weirs further downstream and dramatically increase water levels at high flows.

Mitigation actions

Reduction of floodplain capacity: All excavated material will be removed from site. This means there will be no net loss of floodplain capacity long term. In fact, there will be a minimal increase when the pond is not at full capacity.

Breach of pond banks: The pond will not be bunded, with all won material removed from site. The current ground level will determine bank height and theoretical maximum depth. This eliminates the risk of the pond banks breaching.

Sediment ingress into the Emm Brook during and immediately post construction: The proposed pond location is not connected to the Emm Brook with any surface water flow pathways or ground water drainage systems reducing the risk for any loose sediment to be transported into the Emm Brook. The pond will be plug planted to speed up the colonisation of the pond by plants, that will quickly cover and bind any exposed earth. Groundworks will also not take place during periods of high rainfall or increased flood risk.

Catastrophic blockages – (rapid) increase of water levels at peak flows: All structures will be secured in place with chesnut stakes, jute rope and fencing staples. These methods have proven successful on several other projects in the SERT area. Annual checks will be carried out to ensure the continued structural integrity of all structures.

Conclusions

Due to the nature of the interventions and our mitigation measures, we can confidently state that our proposed construction works will not have any negative effect on flood risk, both during construction and post construction.

Flood Response

During construction the Site Manager will register to the EA Floodline and the Flood Warnings Direct service.

Weather conditions and river levels will be monitored before and during the works. In the event of sustained heavy rainfall, the works will be suspended until river levels are deemed safe to resume by the Site Manager.

No unsecured materials will be left within the channel or floodplain overnight during periods of high flow when they are likely to be mobilised.