

<b>Committee(s):</b> Epping Forest Consultative Committee	<b>Date(s):</b> 21/10/2020
<b>Subject:</b> Wanstead Park Ponds Project – Initial Engineering Assessment	<b>Public</b>
<b>Report of:</b> Director of Open Spaces	<b>For Information</b>
<b>Report author:</b> Tim Munday	

### Summary

The initial engineering assessment of the chain of ponds at Wanstead Park has now been concluded. The aim of the study was to establish if the dam structures were sufficient to meet the requirements for High Risk 'Large Raised Reservoirs' and determine what work, if any, may need to be undertaken. The report by the Panel Engineer (Appendix 1) has made recommendations regarding each of the ponds. The recommended works are not as extensive as was initially perceived to be the case at the start of the project. This is due in part due to the categorisation of the ponds which has meant that the requirements for the dam structures are less than anticipated.

It is proposed to carry out the recommended works in full. One recommendation is to conduct a further study into the interaction of the River Roding and Ornamental Water, which presents the opportunity to seriously consider the future water supply to the lakes. So that this can be fully taken account of and to inform the future project options, it is being proposed that this is done ahead of moving to the next project gateway. To enable this an Issues Report will be required to amend the scope and budget for the project.

### Recommendation(s)

Members are asked to:

- Note this report.
- Note the Panel Engineer's recommendations

### Main Report

#### Background

1. Wanstead Park is East London's oldest public park and considered to be London's greatest surviving designed waterscape. At its most extensive (circa

1800) there were nine artificial lakes within the Park. Five lakes remain today and form a cascade with the lower four lakes the responsibility of the City of London Corporation. A substantial proportion of the Park and Out Park were added to Epping Forest by the City Corporation between 1876 and 1880. In 2001 the Park was designated a Grade II\* – ‘a garden of special interest’ - Registered Park and Garden (RPG) by English Heritage (now Historic England), following an earlier Grade II designation in 1987. Since 2009 Wanstead Park has been on Historic England’s Heritage at Risk Register (HARR).

2. Wanstead Park faces four key challenges to its continued integrity.  
**Heritage** - The Park was placed on the Heritage at Risk Register in 2009 due to differences in management by the four owners and the deteriorating condition of the Park’s heritage features.  
**Water Supply** - The largely City-owned lake cascade at the heart of the listed landscape has a long-term negative water budget with insufficient inflow and widespread leakage which is currently augmented by aquifer pumping and is likely to see future reductions in abstraction permissions if the water holding capacity of the lakes is not stabilised.  
**Local Flooding** - The Park is also at risk of occasional flooding from the River Roding and the City Corporation has been identified since 2012 as a private riparian owner expected to match fund in partnership upstream flood alleviation works grant-aided by DEFRA  
**Reservoir Safety** – In 2018, The Environment Agency designated three of the cascade’s lakes, for which the City Corporation is the reservoir owner, as ‘High Risk’ in a risk assessment of dam safety during Probable Maximum Floods.
3. The Wanstead Park Ponds Project was initiated in July 2019 as a Gateway 2 project to fulfil the City Corporation’s statutory duties as the reservoir owner of the ponds at Wanstead Park and to identify the solutions to achieving this and other works in the Wanstead Parkland Plan, contributing to the removal of the Heritage at Risk status of the listed landscape. This was required following the Environment Agency’s designation of the Large Raised Reservoirs as being ‘High Risk’.
4. Dams and Reservoirs Limited, and their Panel Engineer were contracted to undertake an initial engineering assessment of the four ponds (Shoulder of Mutton, Heronry, Perch and Ornamental Water). This was to establish the requirement for each of the pond structures and if they were currently able to safely overtop. It was expected that the requirement would be assessed against the Probable Maximum Flood, as had been the case for the Hampstead Heath Ponds Project.
5. In November 2019 a survey of the four ponds and their structures was undertaken to provide data for the initial engineering assessment and flood routing calculations.

## **Current Position**

6. The final report (Appendix 1) from the Panel Engineer was received in August 2020. In this report the reason for the Category allocated to each of the dams is

explained. The dams of Shoulder of Mutton, Heronry and Perch are Category C, as the consequence of failure would post negligible risk to life and cause limited damage. Ornamental Water, the lowest pond in the cascade, has a Category D dam, as the consequence of failure is where no loss of life can be foreseen as a result of breach and very limited additional damage would be caused. The cascading nature of the dams has been considered in the assessment and report.

7. The Safety Check Flood and Design Flood for Category C and D dams is lower intensity flood event than the Probable Maximum Flood previously anticipated to be required. As such the requirements for the dams is to pass less extreme design and safety check flood events than was the case at Hampstead Heath.
8. The report also notes that some owners of dams decide to provide a higher degree of protection for a number of reasons; this could include an understanding that the marginal cost of providing higher protection is not very much, or the organisation does not want to suffer any reputational loss should a dam fail. This is not considered to be necessary in this case and the categories assigned and the level of protection required are considered by Dams and Reservoirs Ltd to be appropriate.
9. The report notes that Shoulder of Mutton and Ornamental Water both overtop in their design floods and that further works are required to ensure this occurs safely. Work is also recommended at Heronry and Perch to support ongoing and future good maintenance of the dams. The works recommended are summarised in Table 1.

<b>Pond</b>	<b>Recommendations</b>
Shoulder of Mutton	<ul style="list-style-type: none"> <li>- Regulation of the dam's crest.</li> <li>- Maintenance of short grass cover to dam's embankment.</li> </ul>
Heronry	<ul style="list-style-type: none"> <li>- Regulation of the dam's crest.</li> <li>- Installation of a concrete edging beam.</li> <li>- Grass improvement to the dam's embankment.</li> <li>- Regrading of the dam's embankment.</li> </ul>
Perch	<ul style="list-style-type: none"> <li>- Regulation of the dam's crest.</li> <li>- Installation of a concrete edging beam.</li> </ul>
Ornamental Water	<ul style="list-style-type: none"> <li>- Ensuring the overtopping occurs only at overflow embankment.</li> <li>- Regulation of the dam's crest.</li> <li>- An 'engineered' reinforced grass system to the overflow embankment's downstream face.</li> <li>- A further study to understand the effects of the interaction with the River Roding.</li> </ul>

**Table 1: Summary of Panel Engineer's Recommendations**

10. The Panel Engineer has highlighted that in the case of the Ornamental Water the interaction with the adjacent River Roding maybe a governing factor, and that erosion from flooding from the Roding may be a greater risk to the dam then from overtopping. The Ornamental Water sits in the flood zone of the River Roding. The Panel Engineer has recommended a further study to understand this interaction.
11. This study would also be an opportunity to consider the water supply to the ponds including the possibility and implications on reservoir safety of re-establishing the pumping house to the River Roding. The lakes have long term issues with water supply and this issue has been noted as a major factor in the park's Heritage at Risk status.
12. It is preferable to undertake this study ahead of proceeding to the next gateway as it will have a material impact on determining the options considered at that stage. To enable this, an Issues Report extending this stage of the project will be considered by Corporate Projects Board, Projects Sub and the Epping Forest and Commons Committee. This will require the reallocation of unspent budget and a possible request for further funding. At the time of writing the exact cost of the study is still to be confirmed. It will also result in a delay to the project's timeline, with the expectation that project will now move to the next gateway in early 2021.
13. The process of appointing a Communications Officer for the Project is underway and when this person is in post they will assist stakeholders with understanding the Panel Engineer's report and its implications for the project.
14. The Panel Engineer has estimated the costs for the recommended works on site to be approximately £500 000. The estimated total cost of the project is now likely to be up to £1 million. This is significantly less than was anticipated for the project initially which was £8-12 million, this will be noted in the Issues Report.

## **Options**

15. It would be possible to proceed to the next gateway and delay the recommended study. But it is likely that the study outcomes will have a significant impact on the options considered at Gateway 3 and would include a significant risk that the options proposed for work to improve the Ornamental Water would be ineffective and that further work would then be required. This is not being proposed.
16. Other options include undertaking the study but without considering implications to the future water supply, incorporating water supply options into study or considering the possibility of treating the dams as a higher category. Each option would require an Issues Report to change the current project.

## **Proposals**

17. It proposed that a study is undertaken as recommended by the Panel Engineer, and that this should include reviewing possible options for future water supply. This should be done ahead of progressing to Gateway 3.

## **Corporate & Strategic Implications**

18. This would, under the guidance of the Panel Engineer, continue to progress the fulfilment of the City Corporation's statutory duties as a reservoir owner.
19. This will continue to contribute to the Corporate Plans outcomes that people are safe and feel safe, that our spaces are secure, resilient and well-maintained and that our physical spaces have clean air, land and water and support a thriving and sustainable natural environment.
20. This will ensure that the project continues to deliver the Open Spaces business plan objectives that our open spaces, heritage and cultural assets are protected, conserved and enhanced, that London has clean air and mitigates flood risk and climate change and that our spaces are accessible, inclusive and safe.

## **Implications**

21. The further study will need to be funded by the reallocation of £40 000 worth of currently unallocated underspend from the initial engineering assessment fees and may require additional funding.
22. The further study will also delay the progression to the next gateway by approximately 3-6 months. But will enable a higher level of confidence in the options presented at that stage.
23. Continued action is required to give the Environment Agency confidence that the City Corporation are addressing the concerns related to the 'High Risk' status of the Large Raised Reservoirs. If the City Corporation fails to comply with a recommendation of the Inspecting Engineer, the Environment Agency have statutory enforcement powers.

## **Conclusion**

24. The Initial Engineering Assessment has identified works required to ensure that the cascade of ponds at Wanstead Park safely fulfil the requirements for their category of dams. This is to pass a less extreme design/safety flood than anticipated. It has also led to the recommendation that a further study should be undertaken to understand the interaction between the Ornamental Water and the River Roding.
25. It is proposed that this study is undertaken before the project progresses to the next gateway and that it should be used as an opportunity to investigate the feasibility and implications for possibly options to the lakes long-term water supply issues.
26. To enable this an Issues Report will need to be considered by the appropriate committees. This report will address the recommendations of the Panel Engineer, request the reallocation of funding and additional funding and notify the committees to the implications to the project timeline and overall project budget.

## **Appendices**

- Appendix 1 – Wanstead Park Ponds Flood Study

## **Background Papers**

Wanstead Park Ponds Project – Project Briefing

Wanstead Park Ponds Project – Gateway 2 Report

## **Tim Munday**

Department of the Built Environment

T: 020 7332 1949

E: [tim.munday@cityoflondon.gov.uk](mailto:tim.munday@cityoflondon.gov.uk)