

<b>Committee(s):</b>	<b>Date(s):</b>
Hampstead Heath, Highgate Wood and Queen's Park Management Committee	9th May 2013
<b>Subject:</b> Hampstead Heath Ponds Project – Assessment of the Design Flood	<b>Public</b>
<b>Report of:</b> <b>Superintendent of Hampstead Heath</b>	<b>For Approval</b>

### Summary

This report sets out the results on the first major task undertaken by the Design Team in relation to the Hampstead Heath Ponds Project. The City of London agreed that before any work commenced on preparing options and detailed design solutions the Design Team would undertake a Fundamental Review of the basis for the whole project. This work was deemed necessary by the City Corporation following the independent peer review of the original feasibility study and was also requested by the members of the Hampstead Heath Ponds Project Stakeholder Group.

The review utilises industry standards and software, ensuring that the work is in line with current industry best practice to determine “extreme rainfall events” and their impact on the earth dams across the Hampstead and Highgate chains of ponds. The work undertaken by Atkins follows the methodology set out in their Design Review Method Statement approved in December 2012.

The results show that, in adopting industry best practice and nationally derived data-sets, there remains an unacceptable risk from overtopping the dams. This could potentially result in their failure thereby releasing the stored water to inundate communities south of the Heath, with potential loss of life.

The new study has revealed that flood peaks are between 30-50% lower than those that were modelled by previous hydrologists, which used locally derived data-sets, as the basis to determine the maximum floods.

At this stage Atkins believes these results could reduce the overall impact on the Heath but that storage is still necessary, to help hold back water in major rainfall events, mitigating impacts on other ponds.

The results of this study have been considered by the Hampstead Heath Ponds Project Stakeholder Group and the Hampstead Heath Consultative Committee. Over the next few months utilising these results the Design Team, with support from the Stakeholder Group, will refine the long list of potential design solutions to arrive at two or three preferred schemes. These will then be subject to wide public consultation.

### Recommendation

It is recommended that the Committee receive Design Flood Assessment Report and endorse it as the basis for the continuation of the Hampstead Heath Ponds Project and development of the preferred design options that will be subject to wide public consultation later in the year.

## Main Report

### **Background**

1. Approval was given by the Court of Common Council on 14 July 2011 for the project to upgrade the pond embankments on the Hampstead and Highgate chains. The aims of the project are to reduce the current risk of pond overtopping, embankment erosion, failure and potential loss of life downstream; ensure compliance with the existing requirements of the Reservoirs Act 1975 together with the additional expected requirements under the Flood and Water Management Act 2010 while meeting the obligations of the Hampstead Heath Act 1871; and improving water quality. At the same time it seeks to achieve other environmental gains through, for example, habitat creation.
2. In October 2012 the City of London Corporation appointed a Design Team to undertake the task of preparing designs, achieving planning permission and implementing works to meet its duty of care and mitigate its liabilities.

### **Current Position**

3. The first major task undertaken by the Design Team in relation to the Hampstead Heath Ponds Project was to undertake a Fundamental Review of the basis for the whole project. This work was considered necessary by the City Corporation following the independent peer review of the original feasibility study that identified some concerns about deviation of methods from industry standards and also concerns from the Hampstead Heath Ponds Stakeholder Group. It was agreed that this work be undertaken before any proposals on design options and detailed solutions commenced.
4. The review utilises industry methods and software, ensuring that the work is in line with current industry best practice to determine “extreme rainfall events” and their impact on the earth dams across the Hampstead and Highgate chains of ponds.
5. The work undertaken by Atkins follows the methodology set out in their Design Review Method Statement approved in December 2012. The results of this study have shown there remains an unacceptable risk that in extreme rainfall events the Heath ponds will fill with water and overtop the dams, potentially resulting in their failure and thereby releasing the stored water in the ponds to inundate communities south of the Heath, putting people and property at risk.
6. The results, utilising nationally derived data-sets for rainfall estimation, percentage of run-off of water across the Heath and estimation of the size of a range of floods was then passed through a mathematical model (considered to be one of the most reliable packages in the reservoir industry). The results have shown that flood peaks are between 30-50% lower than the levels that

were modelled by previous hydrologists, who used locally derived data-sets as the basis to determine the maximum floods.

7. Given the complex and critical nature of this threshold stage of the design process, in addition to the detailed Technical Report, Atkins have also produced a Summary of their findings. Both papers are appended to this report (Appendix 1 Summary and Appendix 2 Technical Report).

## **Proposals**

8. It is important to recognise that these results do not necessarily mean a 30 to 50% reduction in the mitigation requirements on site compared to the original feasibility ideas and concepts. Atkins have however stated that they believe these results could reduce the overall impact on the Heath, but that storage capacity is still necessary to help hold back water in major rainfall events and assist with mitigating impacts on other ponds across the Heath.
9. The next stage of the design process is for the Design Team to compile a list of all potential options. These will then be refined to those that are technically feasible. The Design Team have indicated that coarse modelling of one or two options for each chain of ponds where additional storage capacity could be considered would greatly assist in helping understand the impacts on other dams.
10. Continued involvement of the Ponds Project Stakeholder Group supported by the Strategic Landscape Architect at this stage of the project is essential. Time spent now in engaging this Group in the various iterations in refining the long list of options to those that are technically feasible and then in selecting the two or three preferred options will provide reassurance to the community that all possible measures are being taken to protect the Heath landscape.

## **Consultation**

11. The Heath Ponds Project Stakeholder Group received a presentation from Dr Andy Hughes Panel Engineer on the Design Flood Assessment at its meeting on the 18<sup>th</sup> March 2013 (see notes of meeting appended to this report Appendix 3). The Group were able to seek clarification on a number of detailed technical issues arising from the study. Members were asked to submit in writing any further clarifications on the technical aspects of the report; these and the responses from Atkins and the City of London Corporation are included at Appendix 4.
12. The Hampstead Heath Consultative Committee held a special meeting on the 8<sup>th</sup> April 2013 to specifically consider this technical report, a copy of the draft minutes of that meeting are also appended to this report (Appendix 5).
13. Members of the Hampstead Heath Consultative Committee were also given an opportunity to seek further clarification on technical issues within the report and these have been included with the Stakeholder at Appendix 4.
14. Members of the Stakeholder Group at their next meeting on the 15<sup>th</sup> April 2013 requested further clarification on a number of the responses provided by Atkins. A specially convened meeting was held at Atkins Epsom offices on

Friday 19<sup>th</sup> April 2013, where three members representing the Heath & Hampstead Society, Fitzroy Farm Residents' Association and Elaine Grove & Oak Village Residents' Association were able to clarify a number of outstanding queries with members of Atkins design team. A copy of the notes of the meeting are also appended to this report (Appendix 6) to provide Members with the full picture of issues raised and responses from Atkins.

## **Corporate & Strategic Implications**

15. The works support the strategic aim 'To provide valued services to London and the nation'. The scheme will improve community facilities, conserve/enhance landscape and biodiversity and contribute to a reduction in water pollution whilst meeting the City Corporation's legal obligations. The risk of any dam breach and serious downstream flooding of communities (and consequent harm to the City's reputation) is mitigated.

## **Implications**

16. The risk of embankment failure at Hampstead Heath is assessed as a high risk on the City of London Corporations strategic risk register. In addition to the current measures to mitigate risks, there are other risks that also need to be considered, including the resources needed for on-going consultation and the potential threat of legal challenge that could still potentially delay the project.

## **Conclusion**

17. Utilising industry based standards and adopting best practice, Atkins have undertaken a Fundamental Review of the basis for the project and have determined that whilst works are still essential to reduce the City of London's liability and meet its duty of care to communities south of the Heath, the size of potential floods in "extreme rainfall events" is less than those derived by previous hydrology consultants.

## **Appendices**

- Appendix 1 and 2 – Hampstead Heath Ponds Project - Flood Design Assessment Summary & Detailed Technical Reports
- Appendix 3 – Notes of the Hampstead Heath Ponds Project Stakeholder meeting 18<sup>th</sup> March 2013.
- Appendix 4 Queries and Responses to Hampstead Heath Ponds Project Stakeholder Group and Consultative Committee from Atkins
- Appendix 5 – Draft Minutes of the Hampstead Heath Consultative Committee 8<sup>th</sup> April 2013

- Appendix 6 – Notes of Meeting held on the 19<sup>th</sup> April 2013 attended by Representatives of the Hampstead Heath Ponds Stakeholder Group and Atkins design Team

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