ATKINS

CITY OF LONDON

Hampstead Heath Ponds Project

ENVIRONMENTAL STATEMENT

NON TECHNICAL SUMMARY (VOLUME 1)

July 2014

Notice

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Document History

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EIA Quality Mark

This Environmental Statement and the Environmental Impact Assessment (EIA) carried out to identify the significant environmental effects of the proposed development have been undertaken in line with our commitments as members of the EIA Quality Mark.

The EIA Quality Mark is a voluntary scheme operated by the Institute of Environmental Management and Assessment (IEMA) through our EIA activities are independently reviewed, on an annual basis, to ensure we continue to deliver excellence in the following areas:

EIA Management
EIA Team Capabilities
EIA Regulatory Compliance
EIA Context & Influence
EIA Content
EIA Presentation
Improving EIA practice

To find out more about the EIA Quality Mark and our registration to it please visit: www.iema.net/qmark

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1. Introduction

Background

1.1 The City of London Corporation (CoL) is seeking to secure full planning permission for the construction of improvements to the ponds on the Hampstead and Highgate chains of ponds within Hampstead Heath.

1.2 Recent studies have shown that dams holding back two chains of ponds on Hampstead Heath are at risk of overtopping (water flowing over the top of the dams) during flood events which could erode the dams and risk their collapse.

1.3 The objective of the Works is to ensure compliance with the Reservoirs Act 1975 and the Hampstead Heath Act of 1871 and, by consequence, the likely requirements of the Flood and Water Management Act 2010. The Hampstead Heath Act of 1871 includes clauses for the preservation of the natural aspect and state of the Heath. The works are also to improve the water quality of the ponds, reducing the current very occasional non-compliance with the EU New Bathing Water Directive of 2006.

1.4 The Proposed Development falls under the Environmental Impact Assessment (EIA) regulations and as such requires an Environmental Statement (ES) to support the planning application. The ES comprises three volumes as shown below. This document constitutes Volume 1 of the ES.

- Volume 1 - Non Technical Summary
- Volume 2 - Main Report
- Volume 3 - Appendices

1.5 The Hampstead and Highgate chains of ponds are both located on Hampstead Heath in the London Borough of Camden as shown on Figure 1.1 below

The site and surrounding environment

Hampstead Heath

1.6 Hampstead Heath is a large public open space covering approximately 300 hectares in the north of London as shown on Figure 1.1. Hampstead Heath is divided in two by Spaniards Road (B519) into the main body of the Heath and the West Heath. The project site is located within the main body of the Heath.

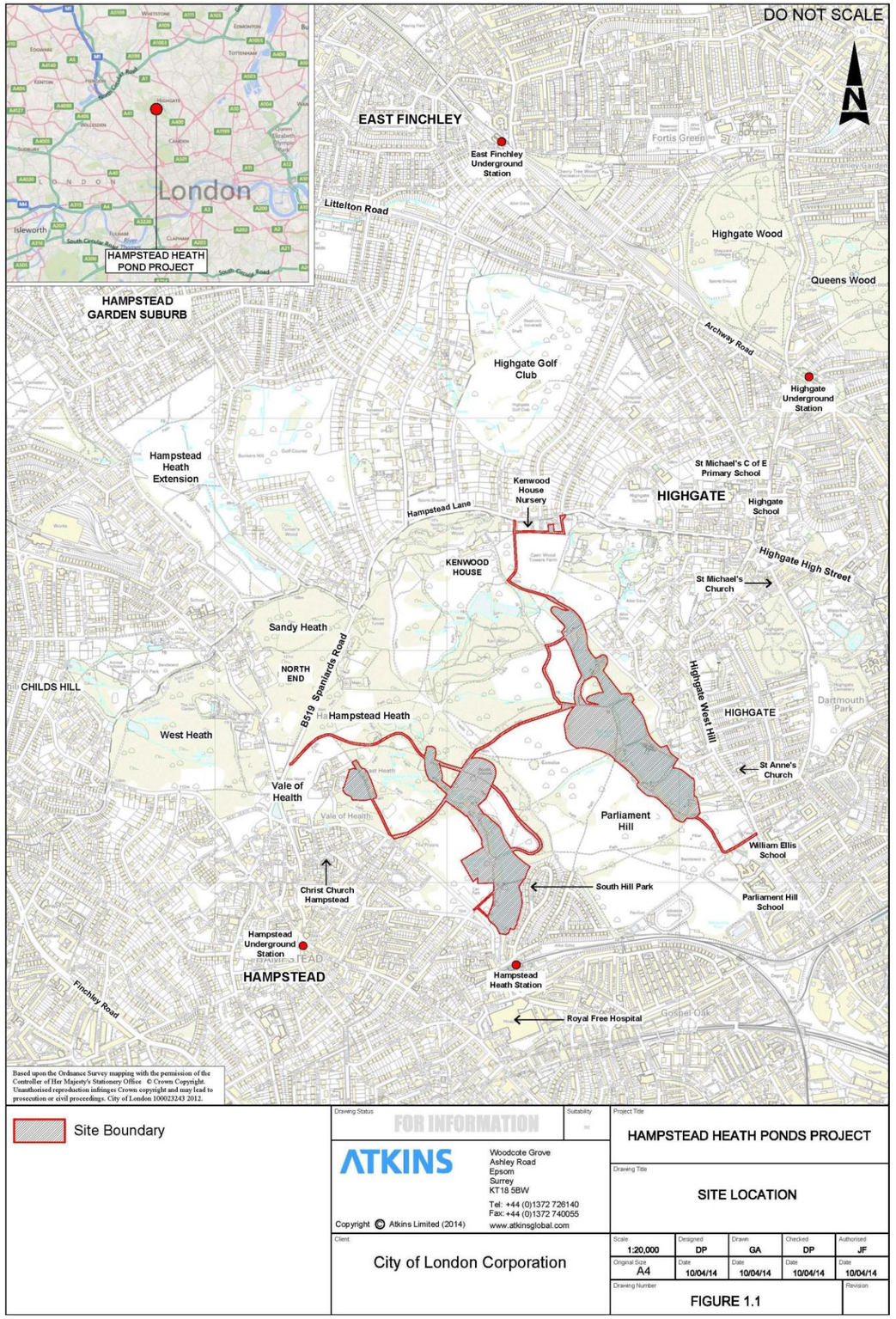

Figure 1.1 Location of the Hampstead Heath Ponds

1.7 Hampstead Heath lies across the Hampstead-Highgate ridge of permeable Bagshot Sands which forms a high ridge running approximately north-east to south-west through the centre of the Heath. Spaniards Road broadly follows the axis of the ridge and is the high point of Hampstead Heath. The main body of the Heath falls away from Spaniards Road fairly steeply in a south easterly direction and there are two shallow valleys that broadly run in the same direction. The northernmost of the two valleys has the Highgate chain of ponds situated along the valley floor and the southernmost valley has the Hampstead chain of ponds situated along the valley floor. Separating the two valleys is a ridge culminating at the southern end in Parliament Hill.

1.8 In addition to the ponds, Hampstead Heath broadly comprises a mix of wooded areas and grassland areas and is intersected by multiple formal and informal footpaths. Two areas of woodland situated in the northern half of the main body of the Heath called the Hampstead Heath Woods (managed by English Heritage) are designated as a Site of Special Scientific Interest and cover an area of approximately 16.6 hectares.

1.9 The grade I listed Kenwood House and Kenwood Estate are located in the north of the main body of the Heath and are currently managed by English Heritage. There are a number of structures and buildings associated with Kenwood House that are designated as grade II and II* listed buildings. In the centre of the main body of the Heath on the ridge separating the two chains of ponds is Bell Barrow designated as a Scheduled Monument.

1.10 Hampstead Heath is bound entirely by built development. To the south and west are the Hampstead suburbs of Gospel Oak and Childs Hill respectively. To the north and east are Highgate and Dartmouth Park respectively. The small hamlet of Vale of Health comprising approximately fifty residential dwelling is located within the main body of the Heath in the south west corner and immediately west of the Vale of Health Pond.

1.11 Most of the built development backing onto the main body of the Heath comprises residential properties, but other notable land uses that could be sensitive to the Proposed Development include the Heath Life Education Centre and Lido located in the southeast corner of the main body of the Heath. To the north of the Lido are a number of formal sports facilities including an athletics track and field, and cricket pitches. The William Ellis secondary school is located adjacent to the cricket pitches. There are a number of additional schools located a short distance from the main body of the Heath in the surrounding suburbs. Figure 2.1 below shows the location of the key environmental features and receptors surrounding the Site. There are two chains of ponds on Hampstead Heath; the Highgate chain of ponds and the Hampstead chain of ponds.

The Highgate chain of ponds

1.12 The Highgate chain of ponds was constructed in the 17th Century as a secure water source for the expanding city of London. The ponds are no longer used as a water source and now primarily valued for their historic, aesthetic and amenity value. The Highgate chain of ponds is the north easterly of the two pond chains and comprises eight ponds. The upper two ponds; Wood Pond and Thousand Pound pond, are located within the SSSI and are not part of the Proposed Development. The six ponds in the Highgate chain of ponds that comprise the Proposed Development are as follows:

- Stock Pond – 0.44 hectares;
- Kenwood Ladies Bathing Pond – 0.68 hectares and is one of the three swimming ponds open year round;
- Bird Sanctuary Pond – 0.75 hectares;
- Model Boating Pond – 1.62 hectares;
- Highgate Men's Bathing Pond – 1.83 hectares and is one of the three swimming ponds open year round;
- Highgate No.1 Pond – 1.36 hectares.

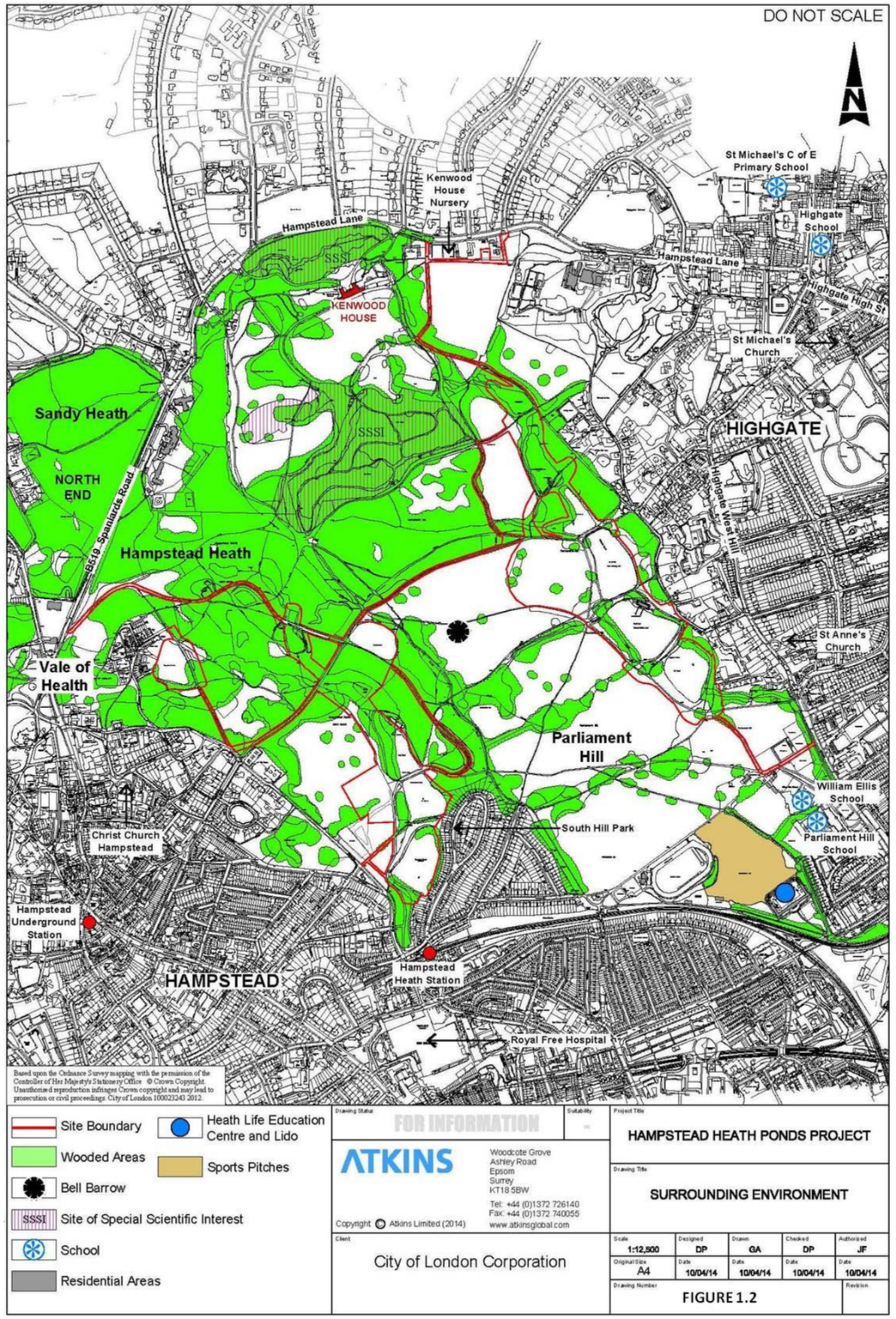

Figure 1.2 Surrounding environment

The Hampstead chain of ponds

1.13 The Hampstead chain of ponds is the earlier of the two chains, dating back to the 16th Century when an Act of Parliament established the chain to facilitate a controlled supply of water via the River Fleet to London. The Hampstead chain comprises five ponds with the upper two ponds being significantly separated from the lower three. The five ponds in the Hampstead chain of ponds that comprise the Proposed Development are listed below. There is also a wooded area that is not currently a pond which is part of the Proposed Development:

- Vale of Health Pond – 0.85 hectares;
- Viaduct Pond – 0.30 hectares;
- Catchpit area – woodland area not currently a pond;
- Mixed Bathing Pond – 0.70 hectares, and is one of the three swimming ponds open year round to bathers;
- Hampstead No. 2 Pond – 1.08 hectares; and
- Hampstead No. 1 Pond – 1.51 hectares.

The Proposed Development

Proposal outline and design

1.14 The purpose of the project is to virtually eliminate the risk of dam failure at any of the ponds in the Highgate and Hampstead chains of ponds that could result from severe flooding and the consequential risk of loss of life and damage to property. In broad terms the key elements of the Proposed Development are as follows:

- Increase flood storage capacity by raising some of the dams and constructing a new dam in the catchpit area;
- Reinforce dams where required;
- Construct spillways to prevent any overtopping which could erode the dams;
- Mitigate ecological and landscape impacts by softening pond edges and improving marginal habitat; and
- Improve the water quality of the ponds.

1.15 Each chain of ponds is considered as a whole system so that significant works are located in the least sensitive locations, limiting tree loss around ponds and reducing works required elsewhere.

1.16 The sensitivity of the Site has been recognised throughout the design process and environmental masterplans have been developed for each pond which illustrate the proposals and mitigation.

1.17 Details of the proposals at each of the ponds are shown in Table 1.1 below.

Construction phase

1.18 Construction would commence in January 2015 and would continue until October 2016. Each pond would operate as a discrete worksite and works would be scheduled so that only a few ponds at any one time are being worked on. The main construction tasks are as follows:

- Vegetation clearance;
- Site set up;
- Pond de-silting;
- Earthworks;
- Spillway construction;
- Demolition and reconstruction of the Kenwood Ladies Bathing Pond changing facilities; and
- Environmental measures and site reinstatement.

Vegetation clearance

1.19 Vegetation clearance would commence in January 2015 and would last for two months. This would avoid the bird nesting season and minimise impacts to other species present on the Heath and sensitive to the works such as reptiles.

Site set up

1.20 The construction works would commence in earnest in April 2015 with the establishment of the construction compound at the Heath maintenance area at Kenwood House Nursery. The first worksite adjacent to the viaduct pond would also be established. The remaining worksites would be established at different intervals throughout the construction programme and just before works start at the particular pond. They would be dismantled as soon as works at the ponds are complete. Figure 1.3 below shows the location of worksites and access to them.

Pond de-silting

1.21 Over the years the ponds have silted up which is adversely affecting their water quality. The silt would be removed from the ponds using a suction pump which would help to improve the water quality.

Earthworks

1.22 The works to the dams would require clay to be excavated from large holes called borrow pits. There would be four borrow pits in total; two for each pond chain. The location of the borrow pits is shown on Figure 1.3 below. After use, the borrow pits would be backfilled with the silt removed from the ponds, covered in topsoil and grassed.

Spillway construction

1.23 At most of the ponds new spillways would be constructed. These are shallow wide channels that direct storm water that spills over from the ponds around the dams to the next pond downstream in a controlled manner. This would prevent uncontrolled storm flows from overtopping the dam potentially eroding them and risking collapse. The spillways would be concrete lined and covered in topsoil and grass to give them a more natural appearance.

Demolition and reconstruction of the Kenwood Ladies Bathing Pond changing facilities

1.24 The existing changing room at the Kenwood Ladies changing room would be demolished and replaced with a new facility in the same location. The new facility would have the same capacity as the existing facility.

Environmental measures and site reinstatement

1.25 The proposals have been designed to have as small an environmental footprint as possible, whilst achieving the project objectives. The works would be focused in the least sensitive areas to minimise impacts and a range of environmental mitigation measures have been incorporated in to the design.

Pond	Dam proposal	Spillway proposal	Tree loss*	Environmental mitigation
Stock Pond	Crest restoration by up to 500mm.	New grass lined spillway at the western end of the dam, 21m wide at the base, with side slopes of 1:12. Two new 900mm overflow pipes to run parallel with the existing overflow pipe.	A: 0 B: 8 C: 15 U: 0	Pond to be de-silted. New marginal planting on eastern bank. Japanese Knotweed to be managed. New tree and shrub planting – extent and location to be agreed.
Kenwood Ladies' Bathing Pond	Crest restoration by up to 300mm.	New grass lined spillway at the western end, 19.4m wide at the base, with side slopes of 1:3. New 600mm diameter overflow pipe alongside the new spillway.	A: 0 B: 3 C: 15 U: 0	Pond to be de-silted. Woody debris check dams and scrapes (3 No.) to be installed along inflow streams upstream to control sediment ingress and improve water quality of discharge to Kenwood Ladies' Bathing Pond. A number of trees will need to be removed within the spillway footprint. Potential to enhance screening of the pond along the western perimeter with new tree and under planting of native shrubs. New tree and shrub planting – extent and location to be agreed.
Bird Sanctuary Pond	Crest restoration by up to 80mm.	No spillway but the slope downstream to the Model Boating Pond is to be smoothed and lined with a turf reinforcement mat. Relocation of the two overflow pipes.	None	Additional channel (46m) to be dug to enhance wetland area. Development and extension of existing reed bed. New wetland scrapes (4 No.) constructed along existing inflow stream to south-west arm to control sediment ingress and improve water quality of discharge to pond.
Model Boating Pond	Dam raised by 2.5m with a new earth embankment upstream of the existing dam. West bank excavated to win material to raise dam and to extend pond. Island created to preserve existing mature trees. A second borrow pit is required to provide material for the raised dam. This borrow pit is proposed for the top of the hill west of the Model Boating Pond. It is intended to partly fill the 2nd borrow pit with silt from the Highgate ponds. Model Boating Pond is the main focus of works on the Highgate Chain.	New upper grass lined spillway over the raised dam and lower grass lined spillway over the existing at the western end to retain existing mature trees on existing dam.	A: 0 B: 2 C: 6 U: 0	Partial de-silting. New island to be formed around the preserved group of existing mature lime trees, London plane and English Oak, and linked to west bank with causeway. New marginal planting on west bank, upstream edge of raised dam and around new island. New footpath on upstream face of the raised dam and along realigned west bank providing continuous access to pond edge. New tree and shrub planting – extent and location to be agreed.
Men's Bathing Pond	Raising of the dam by 1m, using sheet piling, clad according to Heath stakeholder preference.	New grass lined spillway at existing ground level at the western end of dam, 25m wide.	A: 0 B: 0 C: 15 U: 0	Check dams (2 No.) and a small reed bed created on existing inflow to north west corner to control sediment ingress and improve water quality of discharge to pond. New marginal planting along upstream edge of dam with gaps to allow access for anglers. New tree and shrub planting – extent and location to be agreed.
Highgate No.1 Pond	Raising of the dam with a 1.25m high wall, using sheet piling, clad according to Heath stakeholder preference.	New grass lined spillway at the western end of the dam, 64m wide. Return wall along east side of spillway.	A: 0 B: 4 C: 12 U: 1	Trees removed due to construction (1 B and 11C) will be coppiced to facilitate piling rig access and where possible allowed to re-grow from ground level. Extension of the existing reed beds along the north bank and new marginal planting on east bank. New tree and shrub planting – extent and location to be agreed.
Vale of Health Pond	Crest restoration up to 560mm achieved by 300mm of fill and 260mm kerb	New grass lined spillway at the western end where the dam is currently lower, 5m wide. Additional new overflow pipe, 500mm, to run parallel to the existing pipe.	A: 0 B: 1 C: 0 U: 0	Marginal planting on south-east bank. New tree and shrub planting – extent and location to be agreed.
Viaduct Pond	Crest restoration up to 190mm	New grass lined spillway at the eastern end, 4m wide, 1:12 slide slope. New overflow pipe 500mm diameter.	A: 0 B: 0 C: 5 U: 1	Pond to be de-silted. Marginal planting on the east bank and north of the Viaduct. New tree and shrub planting – extent and location to be agreed.

Pond	Dam proposal	Spillway proposal	Tree loss*	Environmental mitigation
Catchpit	New flood storage provided by earth embankment dam, 5.6m high at the lowest point in the valley and 40m wide at the widest point. Crest of the dam approximately 100m long. Slopes 1:3 upstream and 1:4 downstream. Catchpit is the main focus of works on the Hampstead Chain.	Reinforced turf spillway along the whole crest of the dam. 750mm pipe under the dam to pass normal flows. Repair or replace existing pipe between Catchpit and Mixed Bathing Pond. This could be omitted in favour of establishing an overland flow (stream) and the creation of a wetland area.	A: 0 B: 12 C: 49 U:10	Two new silt collection ponds incorporating reed bed filter systems upstream of the dam. Wetland scrapes and informal flow channels downstream of dam to control sediment ingress to Mixed Bathing. Tree removal within footprint of the dam – approximately 60 relatively young predominantly hedgerow tree species and occasional over mature willows, majority of trees have generated from self sown seed stock from adjacent more mature trees. A number of the U trees have been blown over during storm events. Scrub to be planted on upstream face. New tree and shrub planting – extent and location to be agreed.
Mixed Bathing Pond	Dam raised by 1m within footprint of existing dam achieved by raising pond edge by 500mm with 500mm low bund along upstream face. 4m wide path reinstated on crest surface. Downstream slope of raised fill to be 1:3 and lined with reinforced turf to match existing slope, which will be lined with reinforced turf also.	Spillway over the majority of the crest of the dam with 1:20 ramp either side of spillway to preserve existing mature trees. Existing overflow pipe extended further in to the pond.	A: 0 B: 0 C: 7 U: 0	Pond to be de-silted. New marginal planting on the north bank and along the upstream face of the dam. New tree and shrub planting – extent and location to be agreed.
Hampstead No. 2 Pond	Crest restoration with a 0.2m high edging (this is a change since the preferred options and was introduced to allow a reduction in the width of the box culvert, reducing risk to trees)	A new overflow at the western end formed with a precast concrete box culvert, 2.1m wide, with a drop inlet within the pond.	A: 2 B: 0 C: 0 U: 0	Marginal planting on the west bank. Culvert route and width redesigned so that the London Plane trees on the dam, visible from Mixed Bathing Pond are preserved. Platform designed to screen drop inlet – to provide potential area for disabled fishing access. New tree and shrub planting – extent and location to be agreed.
Hampstead No. 1 Pond	No raising or restoration proposed.	New box culvert overflow through and over the embankment at eastern end of dam, Culvert to be buried with topsoil and located to retain existing mature London plane trees.	A: 0 B: 0 C: 5 U: 1	Marginal planting along south and east bank. New tree and shrub planting – extent and location to be agreed.

*Trees are categorised as being A: prominent trees, high quality, veteran trees; B: trees downgraded because of impaired condition, moderate quality trees. However these trees still make a significant contribution to the environment and have relatively high life expectancy; C: young trees or those considered of low quality; they may have a limited life expectancy due to structural defects, may still contribute environmental and landscape benefits as groups; U: poor condition, limited life expectancy and risk of premature failure

DO NOT SCALE

Site Boundary
Worksites
Indicative Location of Borrow Pit
Compound Area
Site Access

Access to Stock Pond via Hampstead Lane
Bulk deliveries to Kenwood Yard
Highgate
Kenwood Yard Compound used for bulk material and fuel storage
Cohen's Fields
West Meadow
Construction area for Stock Pond Works
STOCK POND
LADIES BATHING POND
Construction area for Ladies Bathing Pond Works
BIRD SANCTUARY POND
Access to Ladies, Bird Sanctuary and Model Boating Ponds from Millfield Lane
North End
South Meadow
MODEL BOATING POND
Construction area for Mens Bathing Pond Works
HIGHGATE MENS' BATHING POND
HIGHGATE NO.1 POND
Construction area for Highgate No. 1 Works
VIADUCT POND
VIADUCT BRIDGE
VIADUCT POND
Construction area for Vale of Health Works
VALE OF HEALTH POND
Access to Viaduct Pond via Spaniard's Road
Construction area for Viaduct Pond Works
Construction area for Catchpit Works
Construction area for Model Boating Pond Works
Parliament Hill Fields
Dukes Field
MIXED BATHING POND
Construction area for Mixed Bathing Pond Works
Access to Vale of Health via East Heath Road
HAMPSTEAD No. 2 POND
Construction area for Hampstead No. 2 Works
HAMPSTEAD No. 1 POND
Access to Lower Hampstead Ponds and Catchpit via South End Road/East Heath Road
Construction area for Hampstead No. 1 Works
Hampstead

Drawing Status: FOR INFORMATION
Suitability: -

ATKINS
Woodcote Grove
Ashley Road
Epsom
Surrey
KT18 5BW
Tel: +44 (0)1372 726140
Fax: +44 (0)1372 740055
www.atkinsglobal.com

Client: City of London Corporation

Project Title: HAMPSTEAD HEATH PONDS PROJECT

Drawing Title: WORKSITES, BORROWPITS, COMPOUNDS AND SITE ACCESS

Scale	Designed	Drawn	Checked	Authorised
1:8000	DP	GA	DP	JF
Original Size	Date	Date	Date	Date
A3	10/04/14	10/04/14	10/04/14	10/04/14

Drawing Number: FIGURE 1.3
Revision:

\\WSAtkins.com\Project1\GBEMC\Water\Project\AK0098 Ogms\5117039 Hampstead Heath Flood and WQ Management\170 - Working Folders\176 PlanFIGURE 3.1.dwg
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Alternatives

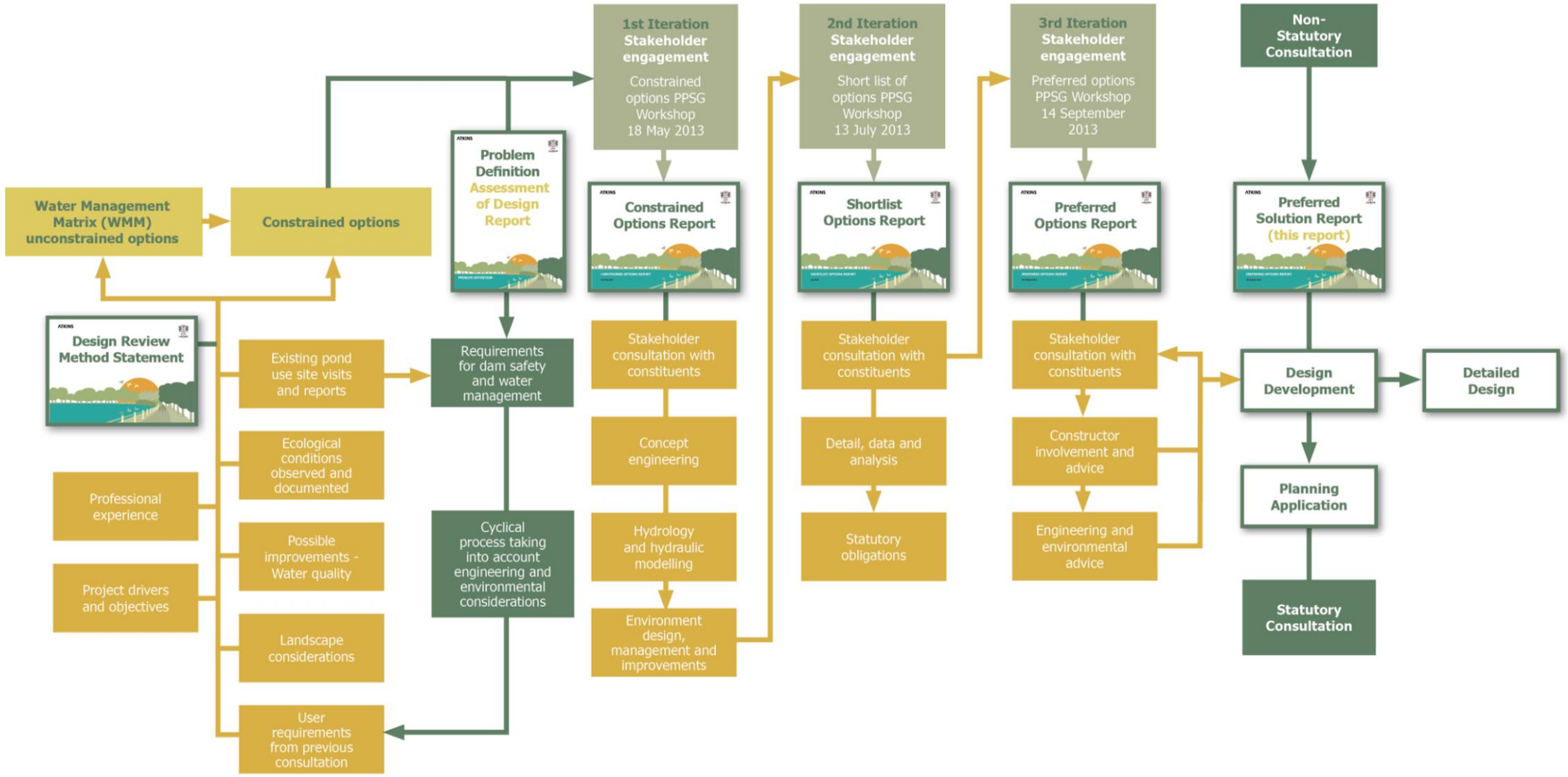

Figure 1.4 Flow chart showing the main stages in the iterative design process

1.26 The design has been developed in an iterative manner with a number of options being discounted at different stages of the process. The starting point for the design process was the City of London's legal duties as custodian of Hampstead Heath and the ponds with regards to the Reservoirs Act 1975, Flood and Water Management Act 2010, and the Hampstead Heath Act 1871. These legal duties require the City of London to strengthen the dams and increase flood storage capacity, whilst maintaining the natural aspect and state of Hampstead Heath.

1.27 Figure 1.4 above shows the different design stages where options were considered and discounted leading to the preferred option described in Chapter 3 above. The initial stage was to define the project which included a high level consideration of all potential options.

1.28 At the initial stage a number of alternatives to the Proposed Development were considered and discounted either because they would not achieve the objectives of the project or fulfil the statutory duties of the City of London, or because they would result in unacceptable and adverse impacts to Hampstead Heath and members of the surrounding community. These discounted alternatives are shown in Table 1.1.

Table 1.1 Main alternatives considered and the reason for their discounting

Alternative	Description	Reason for discounting
Do nothing	The 'do nothing' option consists of no intervention to any of the ponds.	Assuming that the Environment Agency do not intervene, the 'do nothing' option mean that the existing risk of dam overtopping and potential collapse and the corresponding risk to human life and property downstream remains.
Remove the dams	Draining the ponds and removing the dams would mean that there would be no water bodies on the Heath that need to comply with the Reservoirs Act 1975 or the Water Management Act 2010 which remove the City of London's liabilities under these Acts.	This option would result in a negative change to the ecology and landscape of the Heath and would likely result in an increased flood risk downstream.

Alternative	Description	Reason for discounting
Improvement works at the three ponds currently designated as large raised reservoirs	Works to strengthen the dams holding back Hampstead No.1 Pond, Highgate Men's Bathing Pond, and Model Boating Pond would satisfy the City of London's liabilities under the Reservoirs Act 1975.	This option would not satisfy the Flood and Water Management Act 2010 and there would still be a risk of dam overtopping and failure at the remaining ponds. This option would require substantially larger works at the three ponds than is being proposed under the Proposed Development and would result in greater adverse landscape and visual effects.
Lower pond water levels	Pond water levels could be reduced by lowering the overflow pipes connecting the ponds. This would effectively increase the amount of flood storage capacity at each pond.	This option would result in a loss of aquatic and marginal habitat, deterioration to the views across the ponds, a reduction in bathing pond water levels reducing their amenity value, and a reduction in water quality.
Raise pond water levels	Pond water levels could be increased by raising the overflow pipes connecting the ponds. This would effectively reduce the amount of flood storage capacity at each pond.	The increase height in the head waters would put increased pressure on the dams, increasing the possibility of dam failure and consequential downstream flooding. The dams would be overtopped in more frequent storm events than at present further increasing the risk of dam failure.
Re-pile existing dam cores	This option seeks to reinforce the existing dams by adding new sheet piles to the dam core reducing the risk of dam collapse.	Neither of these options would protect the downstream dam slope if the dam is overtopped. This means there would still be a risk of dam failure in storm events.
Re-pile existing upstream dam face	This option seeks to reinforce the existing dams by adding new sheet piles to the upstream face of the dams.	
Installation of new sustainable drainage on the Heath (two options considered)	The first option is the creation of a new offline storage pond just downstream of the Model Boating Pond which would intercept flood water that has overtopped the dam. The new pond would need to be 400m long and 50m wide and would follow the 60m contour around Parliament Hill. This option would still require the raising of Model Boating Pond dam by 0.6m	This option would still require the proposed works at the other ponds and dams but would result in landscape and ecological impacts to a much larger area of the Heath.
	The second option is to attenuate storm runoff in the upper part of the Heath by constructing a series of low embankments up to 0.5m high which would create shallow basins. These would need to be located over permeable geology to allow infiltration of the attenuated water.	The volume of water required to be attenuated would be 236,500m^3. It is not possible to attenuate this volume of water using sustainable drainage on Hampstead Heath.
Creation of additional flood storage area;	Construction of a new underground surface water storage tank to the west of Highgate No.1 Pond; or additional flood storage next to the Ladies Bathing Pond; or next to the Men's Bathing Pond. The tank would store excess flood water that could not be stored in the Highgate chain of ponds and slowly release the water to the sewer network. The tank would have to measure 250m long by 200m wide by 2m high.	This option would not achieve the core aim of the project, namely minimising the risk of failure to the dams. The construction works for this project would be disruptive to Heath users and would have large adverse landscape and visual effects.
Increase the capacity of the Thames Water sewer network;	Increase the capacity of the Thames Water sewer network downstream of the ponds and bring sections of the River Fleet back to life.	This option would not reduce surface water flows across the Heath, would not increase the overflow capacity at any of the ponds, and would not increase flood storage volumes at any of the ponds.
Managed option.	A sophisticated managed response to the pond over topping through the use of technology; an early warning water level rise system and pumping equipment which will not change the landscape of the ponds.	It is not technically possible to provide such a system and if it was it would be extremely difficult and disruptive to evacuate thousands of people with a few hours notice. The City of London has already appointed an emergency contractor, and installed a telemetry system to give early warning of weather or water level changes which could lead to a breach of the dams. This option has already been implemented as far as possible, but it does not change the City of London's liability for the loss of life and any damage to infrastructure and buildings as a result of dam failure, nor does it reduce the risk of dam failure.

2. The EIA process and findings of the assessments

EIA process

2.1 EIA is a process with multiple stages that enables the developer to minimise the environmental effects of their project and informs the decision maker (London Borough of Camden for the Hampstead Heath Ponds project) what the environmental effects of the project are. The main steps in the EIA process are described in Figure 2.1 below.

Scoping

2.2 Through the scoping process described in Figure 2.1, it was determined that the environmental topic areas, where significant environmental effects could arise and warranted further investigation and assessment were as follows:

- Landscape and visual impacts;
- Ecology;
- Water environment (including flood risk and water quality);
- Historic environment (including buried archaeology and built heritage such as listed buildings);
- Community effect;
- Traffic and transport;
- Air quality;
- Noise and vibration; and
- Cumulative effects.

Findings of the environmental assessments

2.3 A summary of the baseline, impact assessment findings, and proposed mitigation is set out in Table 2.1 below.

Screening

The first stage of the EIA is to determine if the project qualifies as EIA development. Broadly if significant environmental effects are likely to arise then it is probable that the project would be considered EIA development.

Scoping

The second stage of the environmental assessment is to determine what are the likely environmental effects that need to be considered in detail. The scoping stage involves consultation with a variety of stakeholders to obtain their views on what would be assessed.

Identify existing conditions (baseline)

Once the scope of the environmental assessments has been agreed, the next stage is to identify and describe the existing environment. This is undertaken through a combination of desk based studies using existing information and field surveys.

Predict and assess likely environmental effects

The next stage is to determine what impacts would arise from the construction and operation of the proposed development, and whether any direct or indirect environmental effects from these impacts would be significant. In determining whether an environmental effect would be significant, published guidance has been used where available.

Develop mitigation measures

Once the environmental effects have been identified, mitigation measures are developed which would seek to minimise significant effects. This is done through either changing aspects of the proposed development design, or construction process, or by compensating for the loss of certain environmental receptors. The preference for mitigation is as follows:

- Preferably avoid the impact; or if not possible
- Reduce the magnitude or scale of the impact; or if not possible
- Compensate for any loss of environmental resources

Predict residual environmental effects

The environmental effects that would remain after the mitigation measures have been applied ,are called the residual effects. The predicted environmental effects that are reported in the Environmental Statement are the residual effects having taken into account the mitigation measures.

Figure 2.1 Key stages of the EIA process

Table 2.1 Summary of the environmental assessments

Environmental topic	Baseline summary	Impact assessment summary	Mitigation summary	Significant effects
Landscape and visual impacts	There are four distinct landscape character areas which comprise the following • Hampstead Heath landscape character area • Hampstead landscape character area • Highgate landscape character area • Barnet landscape character area	The key landscape features that comprise the landscape character of Hampstead Heath are retained. There are no direct or indirect effects to the landscape features of the neighbouring landscape character areas from the Proposed Development.	To minimise landscape effects the core design principles were created to minimise the required works at the most sensitive and visible parts of the two pond chains. Vegetation clearance has been minimised and with few exceptions the mature and veteran trees which contribute to the landscape have been retained.	No significant effects to landscape character
	There are a large number of visual receptors on or neighbouring Hampstead Heath which broadly fall into two categories as follows: • Occupants of residential properties with views of Hampstead Heath • Users of Hampstead Heath, including swimmers, cyclists, walkers, horse riders, and other users.	Visual impacts are generally worse during the construction phase when large excavations and earthworks would occur. Operational visual effects are much reduced with small changes to landform relating to the dams and spillways. The most notable changes occur at Model Boating Pond and the new Catchpit dam	Good construction practices including keeping a tidy site, minimising the construction footprint and fencing off all worksite areas with solid hoarding would be implemented throughout construction. During operation new planting would help the Proposed Development to blend into Hampstead Heath.	Thirty three visual receptors would experience significant adverse effects during construction. Five visual receptors would experience significant adverse effects at the opening year of the Proposed Development. One visual receptor would experience significant adverse effects at year 15 after of the Proposed Development's operation.
Ecology	The ecology on Hampstead Heath has been extensively monitored and studied so there is a wealth of knowledge available. Notably a Site of Special Scientific Interest (SSSI) is present though outside the Proposed Development Site boundary. Notable habitats include areas of woodland, scrub, grassland, marshy areas, and the ponds themselves. Notable species present include, bats, grass snakes, amphibians (frogs, toads, and newts), nesting birds, fungi, insects and fish.	Impacts to ecology principally relate to the loss of habitat and disturbance of species during construction. This would be concentrated at the ponds themselves, the dams, and the areas where the new spillways would be constructed. There is also the potential for introducing invasive species to the ponds and Hampstead Heath. Once construction is complete the reinstated and new habitat would benefit wildlife on Hampstead Heath.	The design of the Proposed Development has taken account of the most sensitive ecological areas and sought to avoid them. During construction, the programme has been designed to avoid activities that could harm wildlife at critical times of year. This includes measures such as ensuring vegetation clearance occurs outside of the bird nesting season. Impacts to legally protected species such as bats would be undertaken in close consultation with Natural England and the necessary licences obtained.	Long term significant beneficial effects for Model Boating Pond and Bird Sanctuary Pond habitats due to improved water quality and pond habitat complexity.
Water environment	There is a high risk of surface water flooding on the low lying parts of Hampstead Heath. There is also a risk of flooding from the ponds over filling with excess water flowing to downstream residential areas. In extreme circumstances this could lead to the dams eroding which leading to a catastrophic failure of the dam.	The main flood risk impact would be the improved standard of protection for the dams which would virtually eliminate the risk of dam failure. There would also be a reduction in flood risk to downstream properties from an increase in flood storage capacity.	Non required	Significant beneficial effect to the Standard of Protection (SoP) for downstream urban areas due to a reduced risk of overtopping of the ponds. Significant beneficial effect for downstream urban areas due to a reduced risk of dam failure.
	The water quality of the ponds at Hampstead Heath is classified as 'moderate', 'poor', or 'bad'. The three swimming ponds meet the highest standards under the Bathing Water Directive.	There would be a deterioration in pond water quality during construction whilst the silt is being removed and works to the pond edges and dams occur. Once construction is complete, water quality would be improved due to the silt being removed and new marshy habitats being planted which would reduce silt being deposited into the ponds.	Standard construction control measures specified by the Environment Agency for works near water bodies would be implemented which would minimise the likelihood of construction impacts to water quality. Silt would be removed through suction pumping rather than mechanical dredging which would result in higher turbidity (cloudy water due to the silt being disturbed and re-suspended) and lower water quality.	Significant long term beneficial effect to the water quality of all ponds with the greatest benefit to the ponds where silt removal would occur.

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Historic environment	There are a large number of designated historic buildings and other assets close to the Proposed Development including a scheduled monument, grades I, II*, and II listed buildings, Kenwood registered park and garden, ancient woodland, historic hedgerows, and the Hampstead and Highgate conservation areas. The ponds themselves are considered heritage assets albeit non-designated.	Direct impacts include works to the ponds particularly the re-shaping of model boating pond and the removal of old water management features (old sheet piling, over flow pipes etc). Indirect impacts include the change of setting to heritage assets due to the appearance of the Proposed Development.	Historic water management features associated with the pond which would be removed would be recorded in accordance with English Heritage guidelines. Visually obtrusive elements of the Proposed Development such as new sheet piling would be minimised. Sheet piling for instance would be clad in timber.	No significant effects to built heritage or archaeology
	The western part of West Heath is located in an archaeological priority area defined by the LB of Barnet	There are no know archaeological remains under the site other than palaeoenvironmental remains (pollen and other natural indicators of past environments).	An archaeological watching brief would be implemented for major earthworks such as the excavation of the borrow pits.	
Community	Hampstead Heath is a popular and well used community asset. Notable community facilities include the three swimming ponds, sports pitches, foot paths, cycle paths, a horse riding path (permit holders only), and general amenity space. The ponds are also used for angling.	During construction a number of the community facilities on Hampstead Heath would be closed. This would typically be for a matter of months and closed facilities would re-open after construction.	Non proposed	Temporary significant adverse effects would arise due to the simultaneous closure of the swimming ponds for 2 months.
	Local residents living close to Hampstead Heath have been considered in terms of multiple impacts that could affect their amenity. There are residents living close to the Vale of Health Pond, Hampstead No.2 Pond, Hampstead No. 1 Pond, and Highgate No.1 Pond.	There would be individual impacts to residential receptors such as noise during construction and visual impacts, but these would not combine to impact on residential amenity. There would also be the permanent loss of residential land at Millfield Cottage due to the construction of the new wall at Highgate No.1 Pond.	Minimise construction footprint	Permanent significant adverse effects to Millfield cottage due to the permanent loss of land.
Traffic and transport	Most of the roads surrounding Hampstead Heath are quiet residential roads, with a few larger roads with higher capacity including Spaniards Road (B519), Highgate West Hill, Mansfield Road (B518). Hampstead Lane (B519), and East Heath Lane. There are numerous bus routes, cycle paths and foot paths close to or within Hampstead Heath.	There would be a slight increase in traffic volumes on the surrounding road network due to construction traffic but this would be barely noticeable. There would be no traffic and transport impacts once construction is complete.	Non required	No significant effects to road users, pedestrians, cyclists, or public transport users.
Air quality	The whole of the London Borough of Camden is within an Air Quality Management Area due to the persistently high levels of nitrous oxides and fine particulate matter. High levels of these pollutants are attributed to traffic emissions.	During construction and particularly excavation and earthworks activities, there is a risk that dust could be generated in long periods of dry and windy weather. This would most likely occur when handling topsoil. Most of the earthworks would be the handling of clay which is required to be kept damp to be suitable for construction. and would not likely generate significant quantities of dust. There would be no air quality impacts once construction is complete.	A range of good practice construction measures recommended by the Institute of Air Quality Management would be implemented.	No significant effects to air quality.

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Noise and vibration	The main noise that can be heard on Hampstead Heath comes from traffic on the surrounding road network, planes flying overhead, and noise from people using Hampstead Heath.	Noise impacts would occur during construction due to the mechanical noise from the equipment being used. The main impacts would be to residents living close to Highgate No.1 Pond and Hampstead No.1 Pond during the sheet piling. There would be no noise impacts once construction has finished.	Standard best practice construction methods would be employed to minimise noise. The noisiest activities would be timed for the least disruptive times of the day and local residents would be given plenty of notice in advance of the noisiest activities.	Short term and temporary significant adverse effects to residents living closest to Highgate No.1 Pond and Hampstead No.1 Pond during construction.
	No major ground borne vibration sources at present.	There may be some noticeable ground borne vibration for some works activities such as piling.	Standard best practice construction methods would be employed to minimise ground borne vibration. The activities that could potentially cause vibration would be timed for the least disruptive times of the day and local residents would be given plenty of notice in advance of these activities.	No significant effects from vibration.
Cumulative effects	There is a proposal to demolish Athlone House and construct a new house on the same site to the immediate north east of Hampstead Heath. London Borough of Camden has requested that the cumulative effects of Athlone House with the Proposed Development be considered.	Cumulative effects to ecology could arise as both developments would impact bats, habitats, reptiles and birds. No other cumulative effects would likely arise.	Ecological mitigation measures proposed for Athlone House and the Hampstead Heath Ponds project would be sufficient. No additional mitigation measures would be required.	Impacts from both developments would not give rise to significant cumulative effects.

ATKINS

Epsom Gateway
2 Ashley Avenue
Epsom
Surrey
KT18 5AL
England

Telephone +44 (0) 1372 75 6280
Mobile +44 (0) 7710 36 3354
Email: mike.woolgar@atkinsglobal.com

www.atkinsglobal.com