

Havant Thicket Winter Storage Reservoir



water resource planning, reservoir design and consultation options

Public Consultation Report - Volume 1

March 2008





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Contents	Page
1. Introduction	
1.1 An Important Stage	4
1.2 A Vision	4
1.3 A Strategy for Involvement	4
1.4 Aims of Current Stage	5
1.5 Means of Consultation	5
1.6 Next Steps	5
2. Need and Alternatives	
2.1 Overview	6
2.2 Water Supply and Demand	6
2.3 Water Management	8
2.4 Alternative Sites for Reservoir	9
3. Reservoir Design Concepts	
3.1 Reservoir Safety	11
3.2 Guiding Principles	11
3.3 Reservoir Operation	12
3.4 Reservoir Layout	12
3.5 Embankment and Slopes	14
3.6 Overflow and Emergency Drawdown	15
3.7 Main Vehicle Access to The Site	15
3.8 Energy Use	17
3.9 Inlet and Outlet Pipelines	17
4. Construction	
4.1 Background	18
4.2 Preparatory Works prior to Construction	18
4.3 Construction Traffic	19
4.4 Construction Sequence	19
5. Landscape, Conservation and Recreation	
5.1 Introduction	20
5.2 Context	20
5.3 Main Elements included in all Activity Scenarios	21
5.4 Activity Scenarios	22
6. Next Steps	
6.1 Further Work	26
6.2 Submission of Planning Application	26



Chapter 1 - Introduction

1.1 An Important Stage

Portsmouth Water has reached an important stage in planning for a reservoir at Havant Thicket:

- Current studies suggest that a reservoir is likely to be needed by 2020 to help meet the water requirements of the local area. The long process of developing a major reservoir means that the design and planning application work needs to start now.
- Consultation undertaken now can enable the local community to play a positive role in influencing the design and ensuring that it brings other benefits to the local community. Local people, organisations and other stakeholders can have a say when there is an opportunity to make changes to the proposals.

1.2 A Vision

Our vision is to provide an integrated solution so that we can construct a reservoir that will not only meet water supply needs but also provide benefits to the local area. A solution is sought, which will:

- Provide value for money to our customers
- Demonstrate best practice in design
- Deliver environmental and social benefits
- Involve partnerships with key stakeholders and involve the local community.

1.3 A Strategy for Involvement

In order to achieve this vision with input from the local community and other stakeholders, a Strategy for Community and Stakeholder Involvement has been produced in discussion with the local authorities. The Strategy (see the Portsmouth Water website: <http://www.portsmouthwater.co.uk>) sets out the main means that will be used through the current period of pre-application consultation (early to mid 2008), when the planning application is submitted (expected in mid 2009), and during construction itself (2013 - 2020).

Portsmouth Water has undertaken initial discussions on the reservoir proposals with the local authorities, and the Havant Thicket Winter Storage Reservoir Stakeholder Group (Table 1.1). Portsmouth Water will continue to meet with these bodies as well as other statutory and technical stakeholders (such as the Environment Agency and Natural England) in developing the proposals for the reservoir.

Table 1.1: Havant Thicket Winter Storage Reservoir Stakeholder group

Consumer Council for Water
East Hampshire District Council
Environment Agency
Forestry Commission
Hampshire & Isle of Wight Wildlife Trust
Hampshire County Council
Hampshire Ornithological Society
Havant Borough Council
Leigh Park Community Board
Rowlands Castle Parish Council
Staunton Country Park

However, the main purpose of the Strategy is to ensure that a wider range of people are now also involved, and particularly at this important current pre-application stage.



1.4 Aims of Consultation

This public consultation report provides information to enable the local community, local organisations, and other stakeholders to:

- Take the opportunity to clarify understanding of the need for additional water supply in the Portsmouth Water area.
- Raise issues and consider options in relation to the design, engineering and construction of the reservoir as far as they have been developed.
- Put forward ideas and suggestions, and participate in developing proposals for landscape, conservation, recreation, education and access.

1.5 Means of Consultation

- An exhibition will be open for visitors in March 2008 at the venues and times listed in Table 1.2. The exhibition presents the main aspects of the proposals so far and there are staff available at all times to answer questions.
- Feedback forms are available on the Portsmouth Water website, at the exhibition and with this report, to provide opportunity to make specific comments, and put forward ideas and suggestions. The forms can be completed at the exhibition or sent to Freepost, Portsmouth Water, c/o Arup, 2nd Floor Brunswick House, 8-13 Brunswick House, Southampton, SO15 2AP by 18 April 2008.
- A workshop will be held on Saturday 29 March to develop proposals and options based on the activity scenarios presented in Chapter 5 of the report, together with the ideas and suggestions being received during the consultation. Participants will be selected in consultation with the Local Authorities to ensure a balanced and wide range of views and interests. Anyone interested in being considered for inclusion in the workshop should contact us via havantthicket@portsmouthwater.co.uk or phone Debbie Lindsay at Arup on 023 8071 5000.

Further copies of this report (including a digital copy on CD) are available at the exhibition, on the Portsmouth Water web site (<http://www.portsmouthwater.co.uk>), and at libraries and Council offices.

Table 1.2: Exhibition Venues and Opening Times

Venue	Date in 2008	Time open to public
Leigh Park Community Centre	Saturday 8 March	10am - 7pm
	Sunday 9 March	10am - 7pm
	Monday 10 March	10am - 9pm
Horndean Technical College	Wednesday 12 March	5.30pm - 9pm
Leigh Park Community Centre	Thursday 13 March	10am - 9pm
	Friday 14 March	10am - 9pm
Rowlands Castle Parish Hall	Saturday 15 March	10am - 7pm
	Sunday 16 March	10am - 7pm
	Monday 17 March	10am - 9pm
	Tuesday 18 March	10am - 9pm

1.6 Next Steps

We very much hope that you will take this opportunity to be involved at this crucial stage in the development of the proposals.

A report on this stage of involvement will be produced in the summer of 2008, summarising the comments and suggestions received and explaining how these will be taken into account in developing the design.

Chapter 2 - Need & Alternatives

2.1 Overview

Portsmouth Water supplies water to an area covering 868 square miles, from Fareham and Bishop's Waltham in the west to Ford and Middleton-on-Sea in the east, and inland as far as the highest points of the South Downs. The majority of the population live on the coastal plain in the urban areas of Fareham, Gosport, Havant, Waterlooville, Portsmouth, Chichester and Bognor Regis (Figure 2.1). On average, 180 million litres of water is supplied every day to 278,000 households and 18,000 businesses.

2.2 Water Supply and Demand

2.2.1 Water Supply

Water for the Company is principally derived from groundwater of the South Downs chalk. Wells and boreholes at 19 sites throughout the Company's area provide approximately 50% of Portsmouth

Water's supplies. A further 15% of the water supplied is derived from the largely groundwater based River Itchen, via a treatment works at Gaters Mill near Southampton. The remaining 35% of water supplied is groundwater from a series of natural springs in Havant and Bedhampton. These springs have been used for public water supply by the Company since 1860 and are reputed to be the largest group of springs used for this purpose in Europe.

Winter rainfall helps to 'recharge' the chalk aquifer of the South Downs. Much of the water flows directly to the sea or appears as perennial springs feeding chalk streams such as the rivers Hamble, Meon and Itchen. In the winter and spring, temporary springs rise in the upper catchments of many valleys, such as the Lavant and Ems in Sussex. These form 'winterbournes' which naturally dry out during the summer months.



Figure 2.1: Portsmouth Water Area of Supply



2.2.2 Water Demand

The critical demand periods for water in the supply area are from the end of May to the end of July. Figure 2.2 shows the changes in demand during 2004 and 2005. The summer period is when additional demand results from garden watering, increased horticultural needs, increased personal washing and the influx of holiday visitors to seaside resorts such as Southsea, Hayling Island, Bognor Regis, Selsey and the Witterings.

As a member of the Water Resources in the South East Group (comprising water companies in the South East of England, the Environment Agency, Natural England, Ofwat, the Consumer Council for Water, Defra and the South East England Regional Assembly) Portsmouth Water has been active in helping to meet regional supply shortages by providing a bulk supply of up to 15 million litres per day to Southern Water Services.

It is predicted that the demand for water will increase over the next 25 years due to the following reasons:

- **Lifestyle changes and lower occupancy households** - As a result of projected increase

in the number of lower occupancy households, (which have a greater water demand per individual - see Figure 2.3), the per person consumption within the company's supply area is projected to increase from an average of 160 in 2007 litres to 174 litres per person per day by 2035.

- **Climate change** - Predicted changes in the climate (such as hotter summers) will mean that people will increase their water consumption.
- **Environmental considerations** - The water environment in and around Hampshire and West Sussex provides many important habitats for wildlife, which need to be preserved. These Natura2000 sites (Special Areas of Conservation - SACs and Special Protection Areas - SPAs) are protected by regulations set out in the European Habitats Directive. In order to safeguard these sensitive environments, limitations are being placed on the abstraction of water at certain sites.
- **Population increase** - It is predicted that the population of the Portsmouth Water supply area could increase by an additional 50,000 people by 2035.

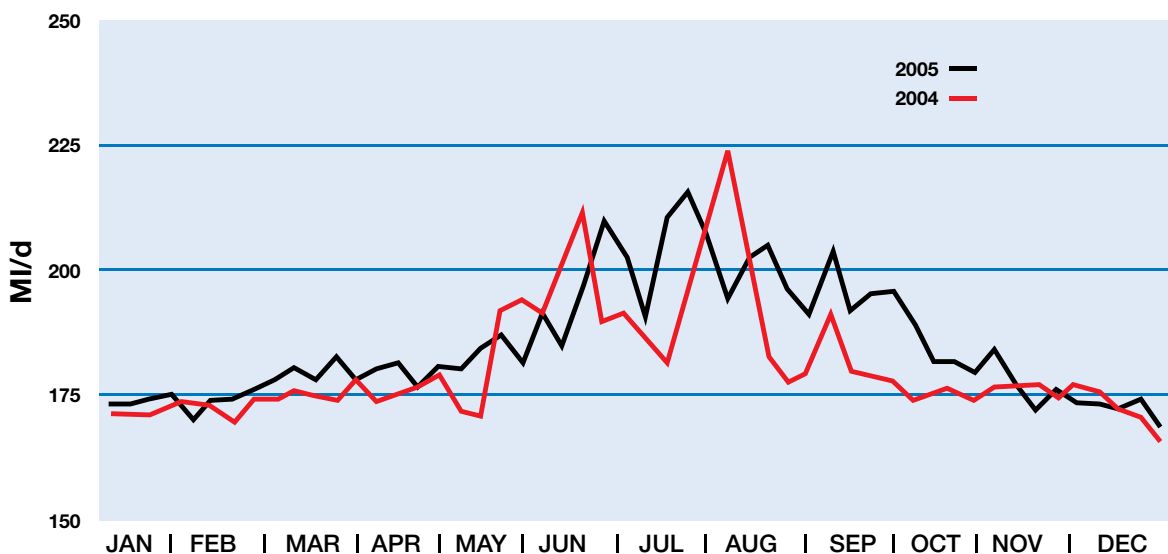


Figure 2.2: Portsmouth Water: Critical demand periods (weekly averages for 2004 & 2005 in million-litres/day)

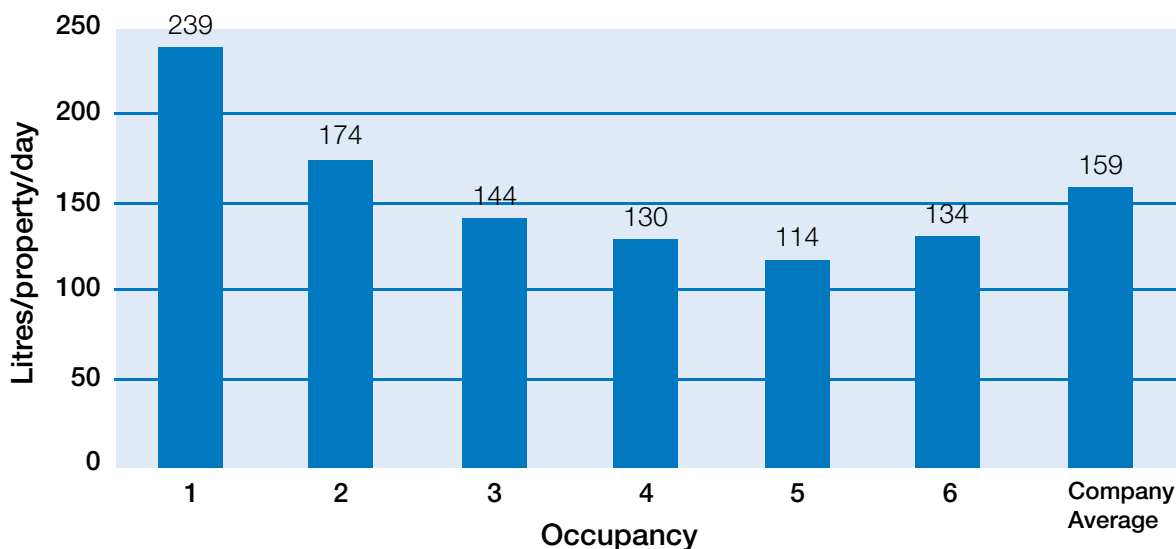


Figure 2.3: Portsmouth Water: Average consumption by occupancy level (2006/2007)

2.3 Water Management

2.3.1 Water Resources Management Plan

Every five years the company produces a water resource management plan, which sets out how supply and demand will be managed for the next 25 years.

The Water Resources Management Plan of 2004 identified a deficit in the supply of water to address the demand predicted by 2020/21. Studies undertaken by other organisations are consistent with the conclusions reached in the 2004 plan. For instance, a recent study by the Water Resources in the South East (WRSE) Group, headed by the Environment Agency indicated potential shortages over much of the South East by 2025.

To address the predicted deficit of water the company has adopted the so called “twin track” approach, in line with government advice:

- Examining means of reducing overall demand for water (through, for instance, efficiency measures, retro-fitting dual flush cisterns, installing low use fittings in new houses); and
- Considering additional water resources (such as a reservoir or abstraction borehole).

A Draft Water Resources Management Plan 2009 is being prepared by Portsmouth Water. This statutory plan will be available for public consultation in May and June 2008, with a final plan to be published in 2009. It too identifies a deficit in water resources within the next 10-15 years. This document will be available from Portsmouth Water and from the Portsmouth Water website. The consultation will provide a more complete understanding of the strategic planning objectives for the Portsmouth Water supply area.

2.3.2 Supply/ Demand Options

A number of demand management and new resource options have been investigated to resolve the deficit predicted for 2020/21:

- An assessment of technically and economically feasible options was identified to address the predicted supply / demand deficit.
- These options were reviewed in consultation with the Havant Thicket Stakeholder Group, and 19 options or schemes were selected for full assessment.



- An assessment, using the Average Incremental Social Cost (AISC)¹ technique, was used to evaluate each scheme (whether it was a demand management measure or a new resource development), in terms of its financial costs, environmental and social effects, and contribution to meeting the supply/demand deficit.

Table 2.1: Water management solutions (identified in 2006)

Solution	Approximate Implementation date
Leakage reduction	2010/11
Compulsory metering	2010/11
Farlington Washwater recovery	2012/13
Additional boreholes at Lavant & Brickkiln	2017/18
Water Efficiency Programme	2018/19
Havant Thicket Winter Storage Reservoir	2020/21

From this process, Havant Thicket Winter Storage Reservoir has been identified as part of a package of measures required to address the predicted supply/demand deficit. The reservoir has a long lead time in order to cover aspects such as environmental assessment, planning, design and construction. Whilst this work is undertaken other schemes which are also part of the package of measures, can be put in place (see Table 2.1).

¹ AISC is calculated by dividing the net present value of scheme costs by its discounted contribution to balancing supply and demand.

2.4 Alternative Sites for Reservoir

2.4.1 Past Studies

The identification of potential sites for the location of a winter storage reservoir has been the subject of a number of studies carried out over the past 40 to 50 years. For various reasons the site at Havant Thicket is seen as the most appropriate.

Portsmouth Water's earlier planning, engineering and environmental studies considered a large number of potential locations:

- The studies commenced in the 1960s when approximately 80 potential reservoir sites, based on the suitability of the ground conditions (presence of an impermeable layer), were identified and assessed.
- Further studies were undertaken in the 1970s and 1980s, focusing on a smaller number of preferred sites. One of the sites (Testwood Lakes) has now been developed by Southern Water. These studies concluded that Havant Thicket was the most appropriate site for a reservoir and that another site (known as Southleigh Farm – located 2km to the east of Havant) should be retained by the company as a reserve site.

2.4.2 Recent Studies

A review of all the sites considered in the earlier studies was undertaken in 2006 (Figure 2.4). This concluded that:

- Most of the reservoir schemes that rely on significant abstraction from either the River Test or the River Itchen would not now be appropriate, in the context of environmental concerns as encompassed by the European Habitats Directive, which not only limits further abstraction of water from these rivers, but is also seeking to reduce existing abstractions.

Havant Thicket Winter Storage Reservoir



- Sites that relied on abstraction of water from smaller rivers such as the Meon or Lavant should be ruled out on similar grounds.
- The storage volume potentially available at Southleigh Farm is not as great as Havant Thicket.
- A reservoir at Southleigh Farm would need to be fully bunded, i.e. an embankment on all sides, due to the topography of the site.
- Ground levels are such that water for storage would require pumping both to and from a reservoir at Southleigh Farm, whereas water would be pumped to the Havant Thicket site and flow by gravity on its return.
- A reservoir at Southleigh Farm would provide less recreational benefit than a reservoir at Havant Thicket.

It was therefore concluded that the Havant Thicket site is the preferred site for a reservoir to be taken forward as part of the package of measures which will be included in the Draft Water Resources Management Plan.

Furthermore Havant Thicket Winter Storage Reservoir is identified in the Draft South East Plan (The Regional Spatial Strategy), as one of the schemes that is likely to be needed over the lifetime of that Plan.

QUESTION 2 (see feedback form): Are there any issues related to need and/or alternatives on which you would like more information?

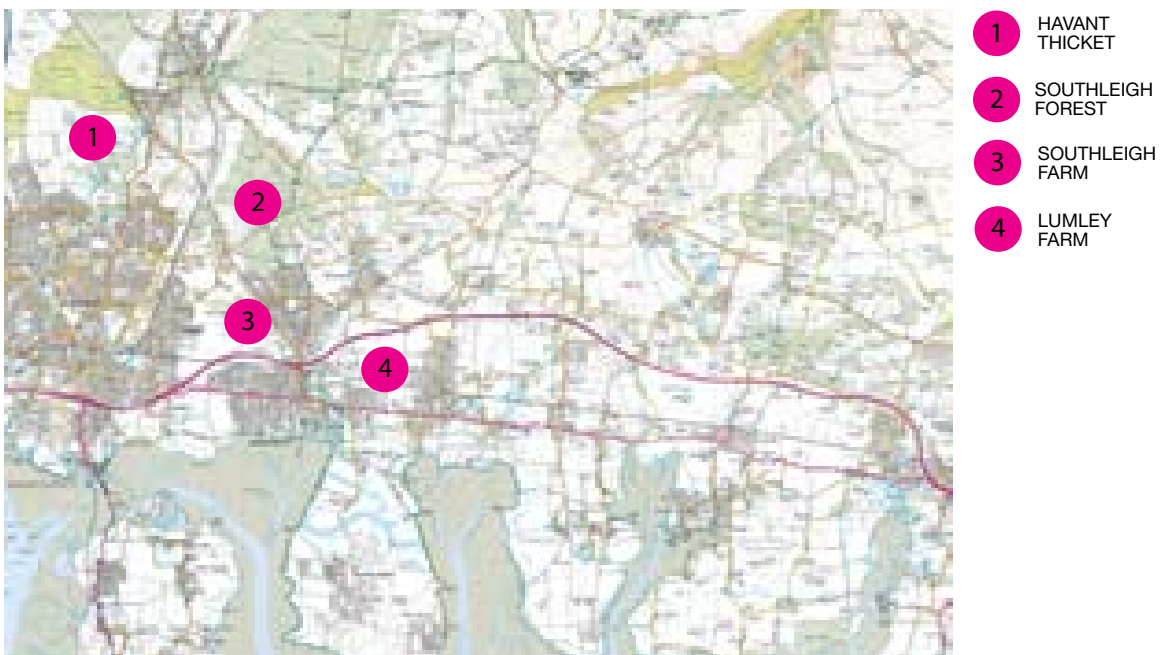


Figure 2.4: Local sites considered in earlier studies



Chapter 3 - Reservoir Design Concepts

3.1 Reservoir Safety and Long term Monitoring

The reservoir construction and its long term management will be under the supervision of a qualified panel engineer (listed by the Institution of Civil Engineers). Portsmouth Water have ultimate responsibility for the safety of it's reservoirs. The Environment Agency is the body with overall responsibility for administration of reservoir safety in the UK. The reservoir will be monitored throughout its life and formally inspected, as specified in the Reservoir Act (1975), on an annual basis.

In line with best practice, Portsmouth Water will also appoint an Expert Review Panel to advise them and provide assurance on reservoir safety matters. Once built, the reservoir will be monitored and formally inspected as required by the Act, with reports sent to the Environment Agency.

3.2 Guiding Principles

Informed by the earlier work (see chapter 2) and the vision (set out in chapter 1) a set of guiding principles has been developed. These principles will provide the framework for the design and development of the reservoir and are reflected in the design proposals described in the report.

Water supply:

- Secure water resources for Portsmouth Water's customers for the long-term future at a reasonable price.

Environment

- Achieve a reasonable balance between development and the environment
- Conserve and seek to enhance biodiversity throughout the lifespan of the reservoir
- Ensure buildings, where required, are of high quality and architectural interest
- Minimise the carbon footprint of the scheme

Construction:

- Protect the amenity of neighbours during construction
- Take steps to minimise environmental impacts such as pollution, noise and vibration
- Minimise transport of materials on and off-site, using site material and locally sourced materials as much as possible

Community benefit:

- Provide managed access consistent with optimising the recreational value of the reservoir site for all
- Promote opportunities for the active use of the site for education

Health and safety:

- Design and manage the site to ensure an exemplary safety record during construction and its lifetime during operation for staff and the public
- Follow best practice for reservoir safety

3.3 Reservoir Operation

The reservoir is designed to store surplus water from the springs at Havant & Bedhampton that, during the winter and spring, would flow into Langstone Harbour. The harbour is a European Habitats Site and conditions are being imposed by the Environment Agency upon the Company's abstraction licence at Havant and Bedhampton to ensure that sufficient flows to support the habitat will be maintained. The surplus spring water will be pumped from Havant and Bedhampton to the reservoir by underground pipeline.

It is envisaged that in most years the reservoir will remain almost full all year round, but in dry years when demand is high, water may be drawn down to augment supplies to customers. In extreme years or if demand increases significantly, the reservoir could be drawn down to very low levels. Providing that there is sufficient rainfall in the following winter, the reservoir could be refilled for the next summer.

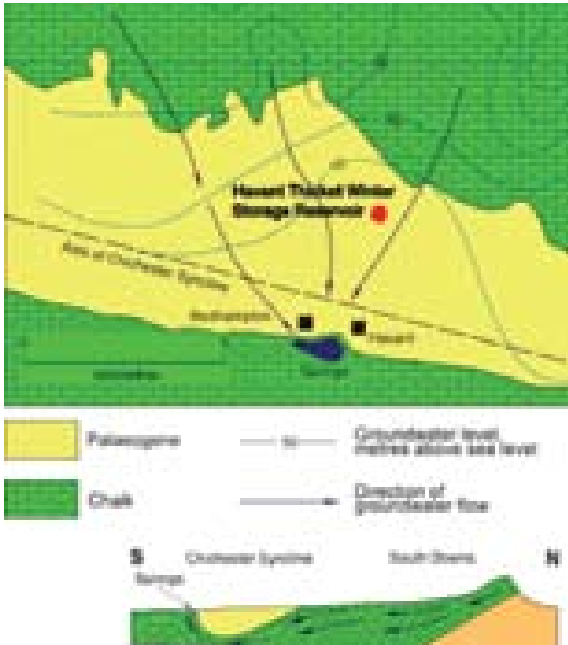


Figure 3.1: Groundwater context of scheme (Source: UK Groundwater Forum)

3.4 Reservoir Layout

3.4.1 Early Designs

The layout proposed in the 1970s by Portsmouth Water made best use of the land purchased and entailed an embankment to the south and east of the site as well as short sections where necessary, on the western boundary. As well as drowning a section of the Avenue and Middle Plantation, a considerable portion of the woodland to the north of 'The Lake' would also have been cleared for embankment construction.

A number of alternatives were also developed by Entec in 2006 and discussed with Stakeholders. Further geotechnical work has ruled out several of these options as insufficient clay from within the site would be available for construction.

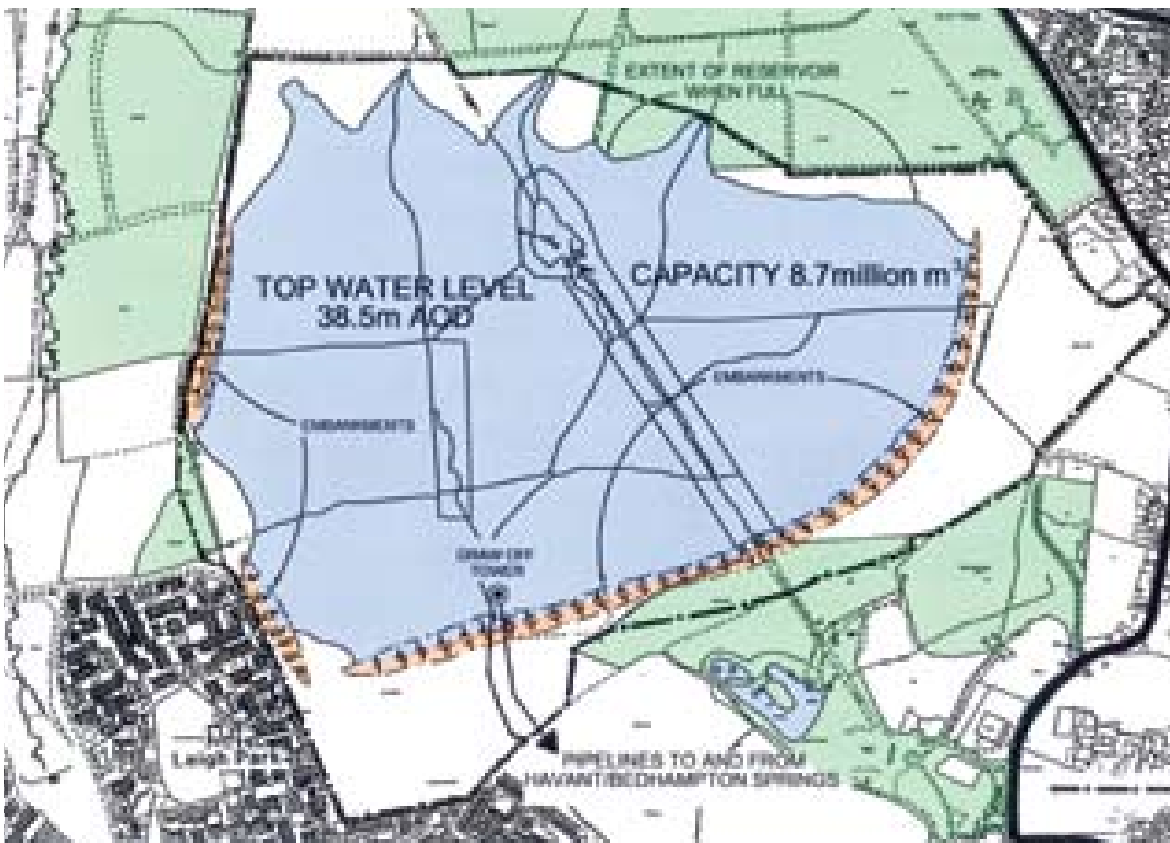


Figure 3.2: Proposed reservoir layout in 1970s

3.4.2 Current Proposals

Refinement of the alternatives has taken place with the aim of maximising the storage volume of the reservoir, while minimising the environmental impact and the overall financial costs. As a result, two options are now proposed for further consideration.

Option 1 (Figure 3.3) provides 8,920 million litres of reservoir storage whilst providing a 15 metre 'buffer zone' between the reservoir embankment and the woodland of the Staunton Country Park. This zone would be used for construction access and occasional access by maintenance staff during normal operations. The estimated cost of constructing Option 1 is in excess £36 million.

Option 2 (Figure 3.4) provides 8,649 million litres of reservoir storage with a wider 'buffer zone' of 40 metres to lessen the disturbance to wildlife in the margins of the Staunton Country Park woodland. Again 15 metres would be required for construction and maintenance operations but a 25 metre strip would be reserved for conservation purposes. As the volume of the reservoir is reduced, so the cost of construction increases by approximately £1 million.

QUESTION 3.1: Which of the locations for the reservoir embankments do you think is most sensible?

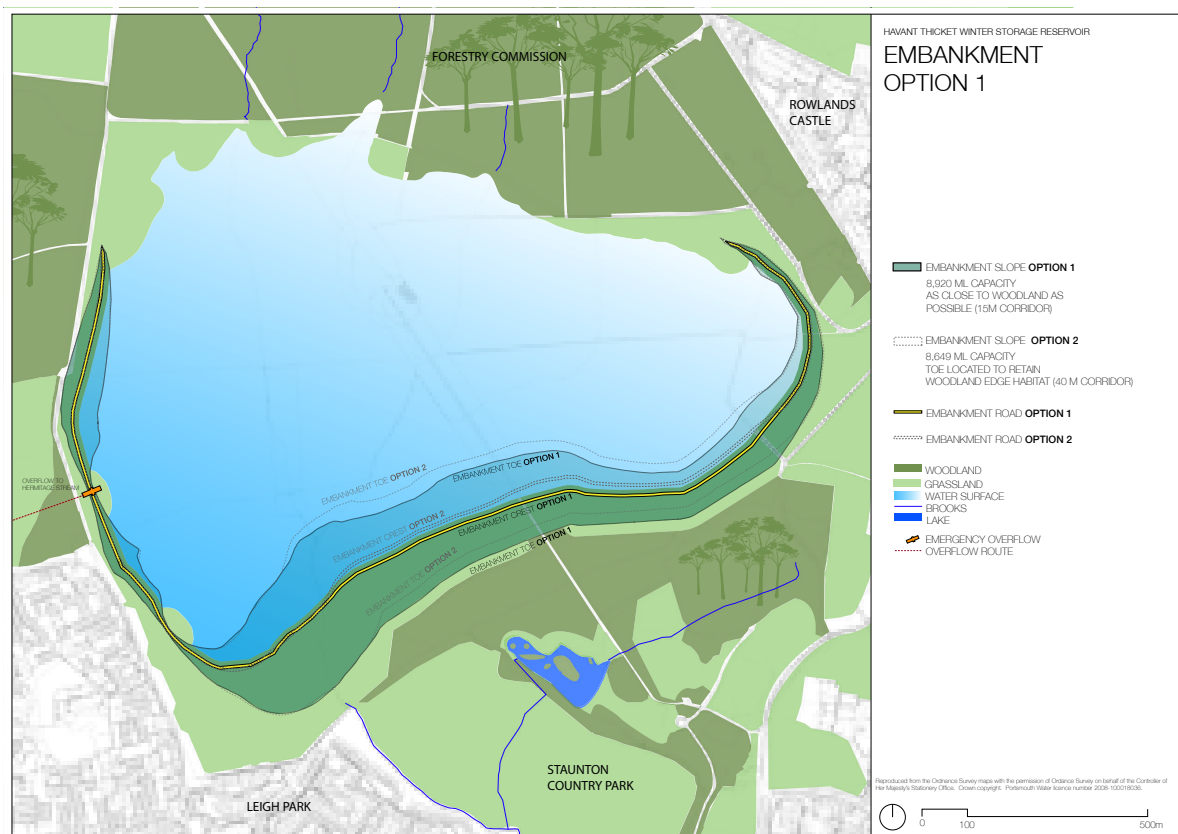


Figure 3.3: Embankment design - option 1 - this drawing is reproduced in Volume 2 at A3

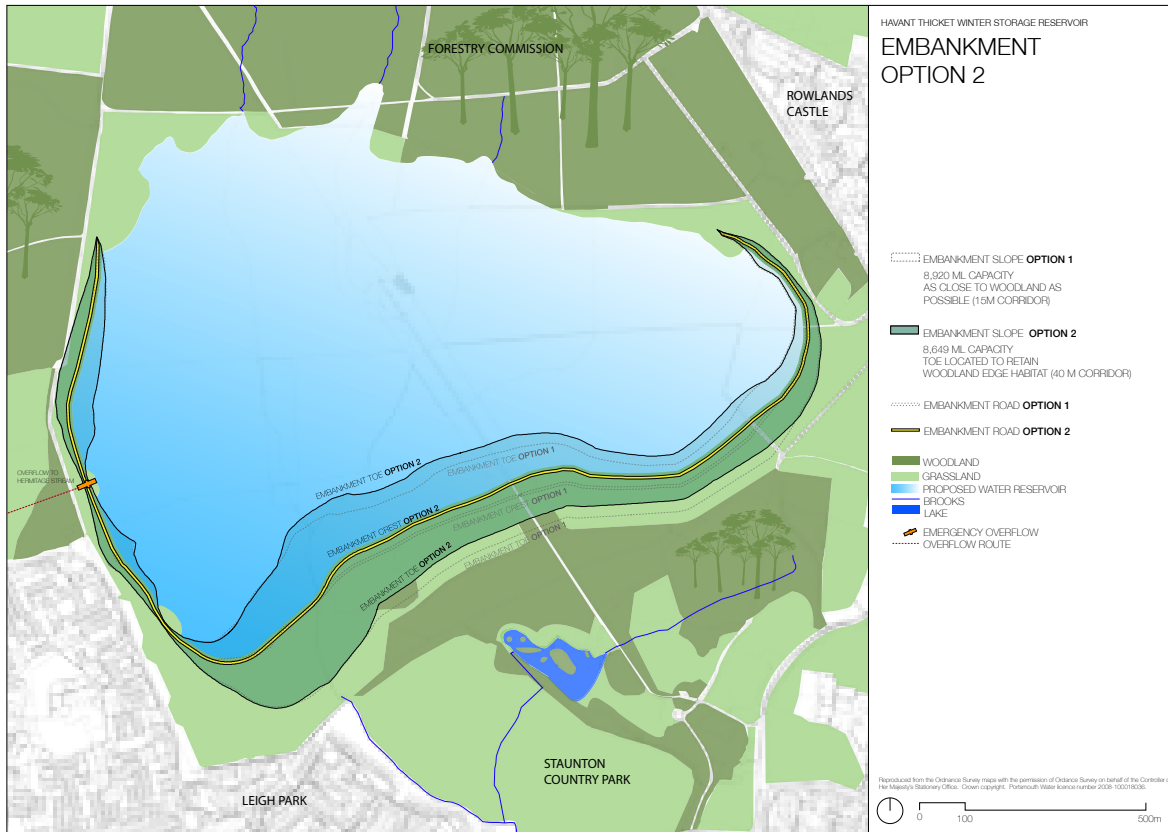


Figure 3.4: Embankment design - option 2 - this drawing is reproduced in Volume 2 at A3

3.5 Embankment and Slopes

3.5.1 Requirements

The slopes of the embankment are determined by the strength of the foundation and the properties of the clay. The following aspects will need to be taken into account:

- The crest of the dam will need to be wide enough to be compacted adequately and will accommodate a track for maintenance vehicles. The inner edge of the crest will have a wall to act as a vehicle barrier and prevent wave splash on to the track. The outer edge will also need a vehicle barrier.
- The outer face (side away from the water) has to be protected from erosion and damage by all possible users. Plants with deep roots such as trees could damage the engineering integrity and water tightness of the embankment. Shrubs could make inspection difficult.

3.5.2 Proposals

The slopes of the embankment have been set as 1 vertical 7 horizontal on both the inner and outer faces to maximise the stability and enable the embankment to be less obvious (Figure 3.5).

Grass is proposed for the outer face. This could be lightly grazed by sheep, provided sheep tracks are prevented. However, the outer face will still need to be mown annually.

The inside face of the embankment (i.e. side facing the water), has to be protected against erosion and damage from wave action. Protection is needed over the whole range of expected water levels and will extend up to the crest of the embankment.

The type of protection will be influenced by locally available materials. Recycled aggregates or locally sourced gravel will be used.

3.6 Overflow and Emergency Drawdown

3.6.1 Requirements

When the reservoir is full it is unlikely, but possible, that heavy rainfall could cause it to overflow. An overflow structure has to be provided for this to happen in a controlled way.

In case of emergency, it is necessary to provide for the reservoir water to be drawdown as quickly as possible to protect the integrity of the embankment.

3.6.2 Proposals

An overflow will provide for extreme rainfall and include culverts to assist with emergency drawdown. This is proposed to discharge into Park Lane Stream (A tributary of the Hermitage Stream) through an open channel.

In emergency it will be possible to use the inlet pipeline as well as the outlet pipeline (see Section 3.8) to ensure the critical draw down is completed in the minimum time.

3.8 Main Vehicle Access to the Site

The main access roads into the site will be used for construction access as well as permanent access to the site.

Five options were considered in 2006 in consultation with the stakeholder group. Of these five, only two options were considered feasible (Figure 3.6). Comments are sought on these options, both of which provide direct access from the B2149. Improvements to the highway in Manor Lodge Road, such as road widening, or provision of a roundabout, may be required to ensure safe access to and egress from the site.

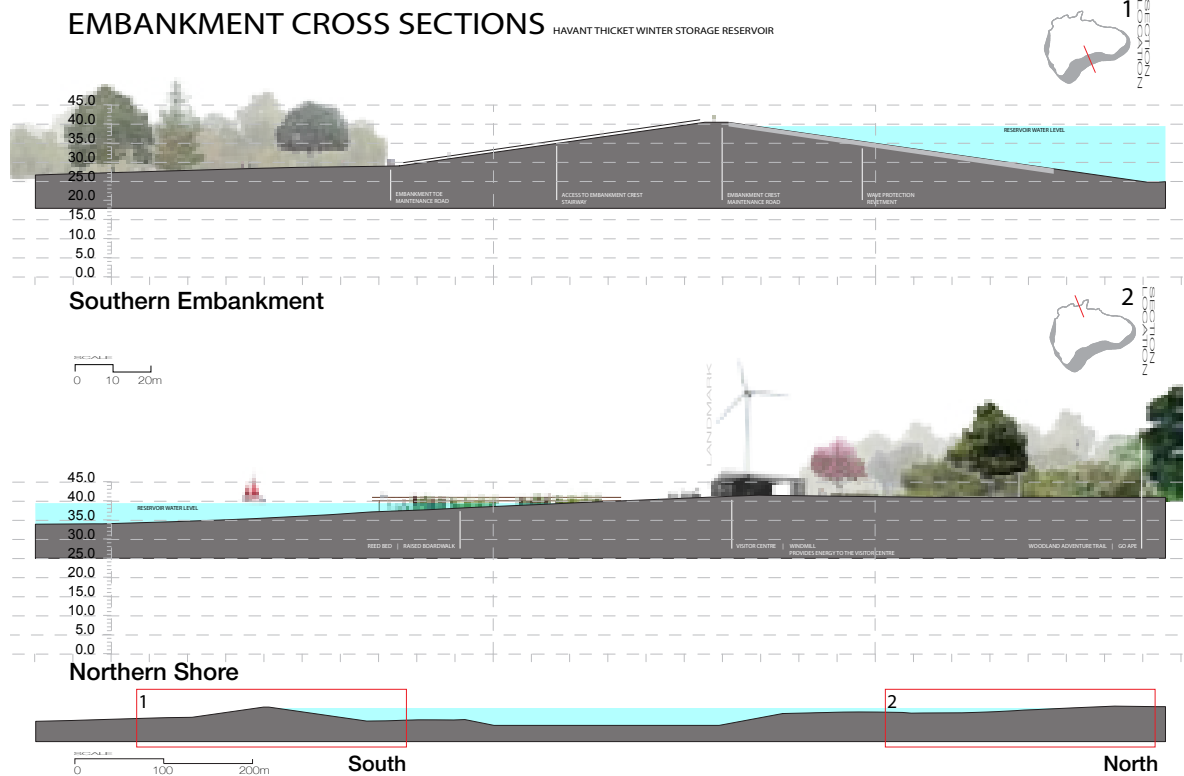


Figure 3.5: Illustration of embankment slope - this drawing is reproduced in Volume 2 at A3

Havant Thicket Winter Storage Reservoir



- **Option 1** - cuts through the Havant Thicket Forestry Commission site. This option will provide easy access through the forest for management access and to the reservoir, however, could have negative impacts on the ecology of the area, especially since the Forest may also be used to re-locate wildlife from the reservoir site during preparatory works before construction.
- **Option 2** - skirts Havant Thicket and will provide access to the north-western side of the site and is likely to have fewer ecological impacts to the Forest.

The precise alignment of the route that is selected as part of the Transport Assessment, will seek to minimise impact on areas of ecological importance, and will be informed by the findings of the current ecological studies.

After construction, operational staff will need to visit the reservoir daily for security purposes. From the main route into the site, maintenance vehicles will need to gain access to the crest of the dam and to the downstream toe for inspection and maintenance.

Access to the control house will be needed for occasional heavy vehicles, and is proposed to be achieved via the local road system to the south-west of the site.

QUESTION 3.2: Which of the two access routes do you think will be the most appropriate?

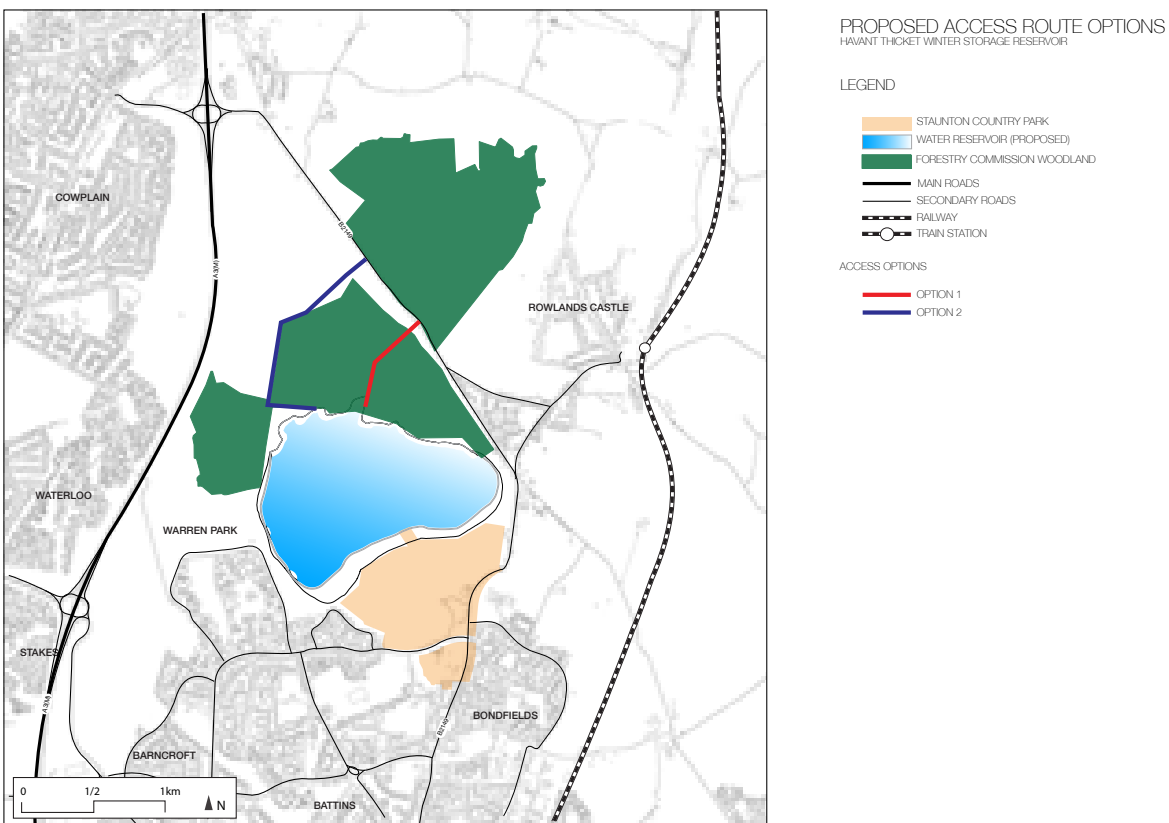


Figure 3.6: Proposed access routes

3.8 Energy Use

The main energy use of the scheme will be for the pumping of water from Havant and Bedhampton springs and the increased treatment required whether at Farlington water treatment works or elsewhere.

Electrical use at the reservoir will be small for lighting, instruments and for operation of valves.

To completely offset the increased electrical use, which will be required in the medium and high activity scenarios, additional renewable generation would be required. On the site this could be achieved by wind turbines or a biomass plant - (which could be fuelled by locally managed woodland - see Section 5.3.5; and Sections 5.4.1 - 5.4.3 for possible locations).

3.9 Inlet and Outlet Pipelines

3.9.1 Requirements

In order to fill the reservoir, a pipeline route will be needed between Havant & Bedhampton and the Havant Thicket site. The pipelines will be buried with the top of the pipes at least 900mm below ground. The same route will be used to draw down the reservoir either for normal use or in an emergency.

3.9.2 Alternatives

The pipeline is likely to be laid by normal trenching techniques with short sections of the trench excavated at any one time. A number of options are under consideration (Figure 3.7):

Red Route - laid in the embankments of the Hermitage Stream from Bedhampton to Corhampton Crescent and then laid alongside the Riders Lane Stream from Corhampton Crescent through Great Copse and crossing Middle Park Way between Bitterne Close and High Lawn Way.

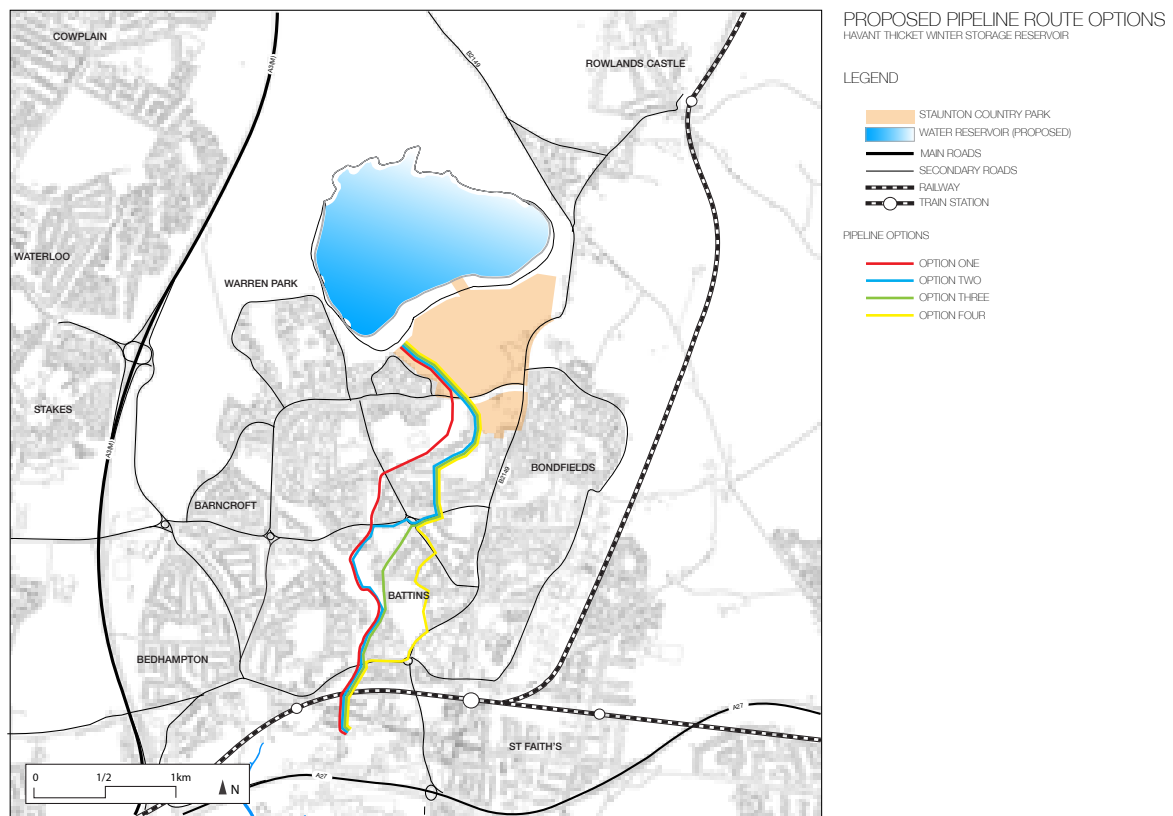


Figure 3.7: Pipeline route options



Blue Route - as for the red route, laid alongside the Hermitage and Riders Lane Streams from Bedhampton Crescent to Purbrook Way and then laid in Purbrook Way, Stockheath Road, Somborne Drive and High Lawn Way.

Green Route - laid in/alongside Stockheath Lane, Stockheath Road, Somborne Drive and High Lawn Way.

Yellow Route - laid in New Road, Petersfield Road, Havant College grounds, Holybourne Road, Blendworth Crescent, Kingsworthy Road, Colemore Square, Bedhampton Way, Stockheath Road, Somborne Drive and High Lawn Way.

Those routes, following the routes of the streams, will cause less disturbance to road traffic and residents, while those laid in the roads will avoid any impact upon the watercourses.

Whichever route (or combination) is selected, the ground surface will be reinstated afterwards; it is possible that the routes following the watercourses may offer opportunities for the provision of footpaths and cycleways.

QUESTION 3.3: Do you have a preference among the pipeline options?

QUESTION 3.4: Do you have any concerns on the main technical requirements of the reservoir design?

Chapter 4 - Construction

4.1 Background

This scheme will require the construction of pipelines and additional water treatment facilities, as well as the reservoir itself. It is expected that the new resource will be required in 2020. The construction period will be approximately three years with a filling period of two years. This requires the main period of construction to start somewhere in the period from about 2015 to allow commissioning by 2020/21 (see table 4.1).

4.2 Preparatory Works prior to Construction

Prior to construction, various enabling works will be required. This includes:

- Further site investigation to provide information for the design of the embankment. This is likely to be done over a period of about four weeks during the summer of 2008.
- Habitat creation and species relocation work to provide for animals and plants that will be displaced by the reservoir and archaeological investigation to be undertaken. These will be set out in an Environmental Management Plan to be developed as part of the environmental impact assessment work for the project.
- Removal of existing woodland within the reservoir area, most probably phased over a number of years.
- Advanced planting prior to construction, to mitigate for the loss of woodland from within the site (such as the Avenue) and to establish some early screening for the construction works wherever possible.



4.3 Construction Traffic

Management of construction traffic will be a key focus in delivery of the scheme. Measures will be taken to minimise these impacts on the local community:

- Most of the materials used for construction on the embankment will be excavated from within the site. Some materials will need to be imported, such as: erosion prevention materials for the inner face of the embankment; materials for the construction of any buildings required; and drainage and supply pipes.
- The other traffic impacts will be during the setting up of the site and delivery of the earth moving fleet to the site.

4.4 Construction Sequence

4.4.1 Site Preparation

The main elements of the site preparation will be:

- Construction of the access road into the site followed by establishment of the contractor's site compound. The site compound may include overnight accommodation for a small number of the work force.
- Fencing to define the work areas and to protect existing habitats, provide site security and ensure public safety.
- Stripping of all the topsoil from the areas to be worked under the supervision of archaeologists to ensure that any unforeseen archaeology is identified and handled appropriately. The topsoil will be stockpiled on site for use later in the project.

4.4.2 Embankment Construction

The earthworks operation will involve the following:

- Excavation of material in sections along the full width and length of the embankment to achieve a foundation on which to build. This material will be stock-piled on the site and may, if suitable, be used later in construction of the embankment.
- Diversion of the water courses within the site to a culvert to allow construction of the embankment over the stream.
- Use of clay, which will be excavated from within the reservoir area, to build the embankments.
- Compaction of the clay, undertaken by heavy (possibly vibrating) rollers towed by bulldozers.
- Top soil placed on the outer embankment slopes and seeded to provide resistance to erosion from rainfall. This work will be undertaken during spring, summer and autumn for the three years of construction.

Other construction work around the site will be focused on drainage work, footpath and access tracks and any buildings required for the scheme.

4.4.3 Filling and Commissioning

After completion of the embankment construction and the associated structures, the diversion culvert will be sealed (with a compensation flow to the Riders Lane Stream maintained). Filling of the reservoir will then be undertaken by pumping water up the pipeline from the Havant and Bedhampton springs, probably over a two-year period. The embankment will be monitored throughout to confirm that it is performing as expected.

QUESTION 4.1: Do you have any concerns regarding the construction of the reservoir?

Chapter 5 - Landscape, Conservation and Recreation

5.1 Introduction

Havant Thicket Winter Storage Reservoir will be the largest inland freshwater body for approximately 30 miles. It therefore has the potential to provide significant benefits for local people and attract visitors from a wider area. Three activity scenarios are presented in this chapter, which illustrate varying scales of activity at the site indicating landscape design, conservation provision and recreation facilities, and the access arrangements for those facilities.

Sections 5.2 and 5.3 describe the factors taken into account in all three activity scenarios, and the elements that they have in common. Section 5.4 describes the three activity scenarios. The figures referred to in this chapter can be found in Volume 2 of this report.

5.2 Context

5.2.1 Surrounding Areas

The main features surrounding the site are identified on Figure 5.1.

The surrounding area is characterised predominantly by woodland:

- To the north there is Havant Thicket itself (managed by the Forestry Commission), and to the south, ancient and semi-natural woodland located within the boundaries of the Sir George Staunton Country Park.
- There is also woodland to the west of the site and to the north of Leigh Park (known as Bells Copse).
- The woodlands screen the site so that views into the site from the surrounding area are generally limited.

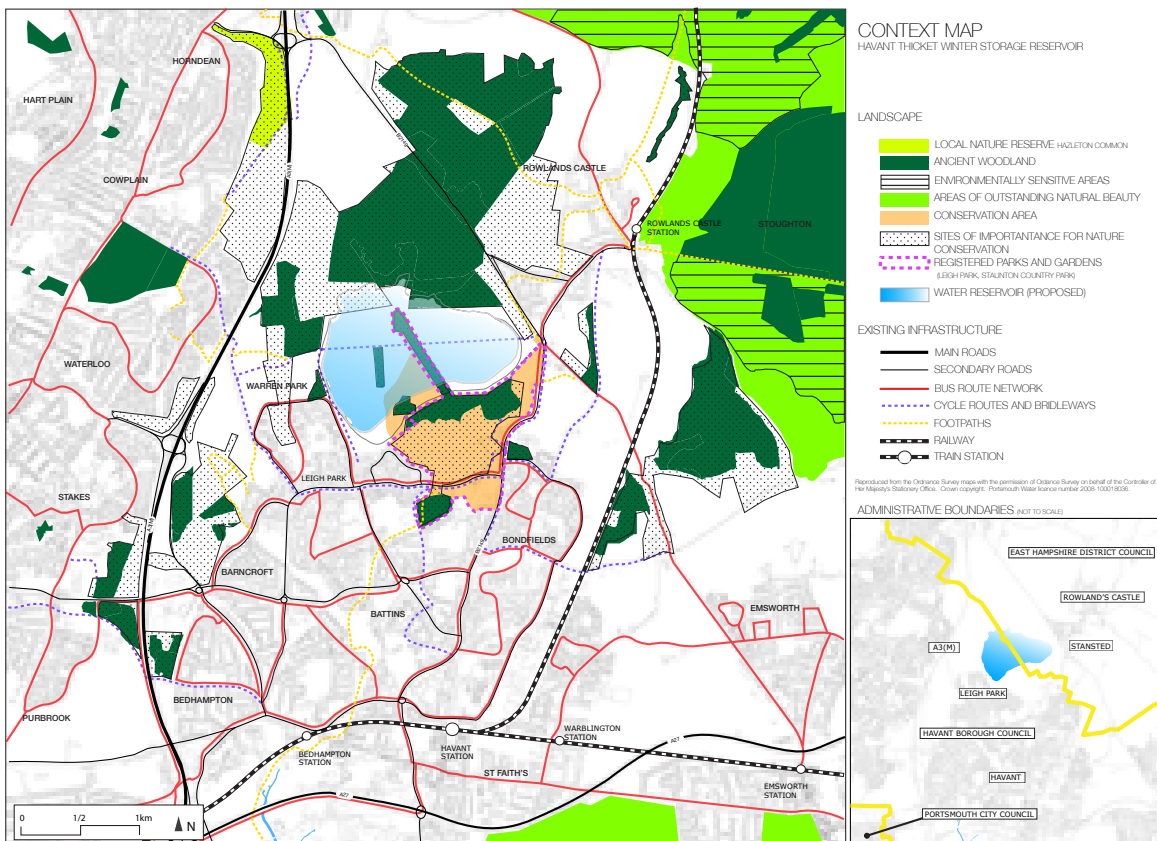


Figure 5.1: Context map - this drawing is reproduced in Volume 2 at A3



- Rowlands Castle to the east: with grassland and some woodland separating it from the main part of the site.
- Leigh Park to the south and west: located closer to the site with some direct views.

5.2.2 Characteristics of the Site

The site lies within a shallow valley and includes approximately 160 hectares of open grassland, and woodland with hedgerows and ditches. It is home to a variety of wildlife associated with grassland and woodland.

Grassland

There are over 10 different types of dry to damp grassland on site. Most types are wet grassland supporting a variety of wildlife including birds, reptiles, insects (including butterflies) and mammals. Reptiles found within the grassland area include adders, slow worms and grass snakes.

Woodlands and Hedgerows

Trees and woodland areas provide shelter and food for a variety of wildlife including plants, insects, birds and mammals. Hedgerows also form links between different habitats and help animals to move safely across the landscape.

Mammals found in the woodland areas on site include several species of bat. Bats are nocturnal and generally live or “roost” wherever there is an enclosed sheltered space with constant temperature.

There are two areas of ancient and semi-natural woodland within the site which will be lost:

- One (The Avenue) is an extension of the main area woodland to the south.
- The other comprises a narrow strip of trees (Middle Plantation) some 250 metres west of The Avenue.

Another area of woodland, located 150 metres south of Middle Plantation, is classified as ancient

replanted woodland and would also be removed as part of the proposals.

Other Designations

There are a number of other designations covering parts of the site (see Figure 5.1):

- The Avenue and the land to the west of it are designated as part of the Sir George Staunton Conservation Area and lie within the Country Park;
- The Avenue is within the boundaries of a Registered Park and Garden (England);
- The Avenue, Middle Clearing and the woodland to the south are all classified as Sites of Importance for Nature Conservation (SINC) - as is much of the Country Park to the south.

5.3 Main Elements included in all the Activity Scenarios

There is a range of elements that will be included in all the activity scenarios, which will protect and enhance the area.

5.3.1 Wildlife Habitats

The disturbance to the existing habitats will mean that alternative sites will need to be identified and new habitats created where appropriate in the vicinity.

All the activity scenarios incorporate features and habitats that would enhance the local ecology and wildlife of the area. These include:

- The water resource itself and the marginal wetland areas created to support a diverse range of flora and fauna, and particular, aquatic species and birds.
- Opportunities for the development of new wildlife habitat within the existing woodlands around the site.



5.3.2 Landscape

The proposed embankment slopes are designed with a shallow gradient and will therefore fit more easily into the local landscape.

However, there is limited scope to plant trees or shrubs that would have extensive root structures and could affect the stability of the slopes. There is also a need to reserve land at the toe of the embankment for maintenance purposes so there would be little scope for planting and habitat creation in this location.

New planting will therefore be concentrated on strengthening existing woodland.

5.3.3 Local Access

The existing east-west bridleway across the site will be diverted around the reservoir. It is proposed that footpath and cycleway links to the surrounding areas are improved and extended (for instance along the pipeline route to link to Bedhampton). New links will be created around the reservoir.

This provision is the same for all three activity scenarios and is shown in Figures 5.2 - 5.4.

5.3.4 Recreation and Education Facilities

These are the elements of the development that could vary most widely between activity scenarios, and are discussed more fully in Section 5.4. The reservoir could be used for bird watching, angling and a wide range of other water-based recreational activities, and could also incorporate opportunities for education, research and interpretation facilities. It is also proposed that footpath and cycleway links to the surrounding areas are improved and extended.

There are some basic principles that have been taken into account in all the activity scenarios:

- Facilities that could attract visitors from a wider area are located away from nearby residential areas in order to respect the amenity of those areas.
- The main access to the site and main car parking are located to the north away from the surrounding residential areas.

5.3.5 Renewable Energy

Renewable energy could be used to provide some or potentially all of the power needed for the operation of the reservoir and for the recreational facilities within the site. Renewable energy can be provided in a number of ways, such as through the incorporation of wind turbines, or through the provision of boilers that use biomass fuels, such as wood chippings.

The aim is to minimise the carbon footprint of the development and activities around the site and include eco-friendly buildings where appropriate.

5.4 Activity Scenarios

The three activity scenarios presented in this section are intended to provide some idea of the different scale of landscape and ecological provision possible, together with different intensity of visitor facilities. These activity scenarios are intended to provide a starting point for discussion at the exhibition and workshop, and in the feedback forms.

Table 5.1, which is provided in Vol. 2 of this report, provides a brief description of the aims of each activity scenario. It then shows the range of facilities suggested for each of them, illustrating how they increase in number from low to medium to high. Table 5.1 also indicates the scale of visitor numbers, and of associated parking that may be required. It is possible that at higher range a bus service into the site could be feasible.

QUESTION 5.1: Which aspects of the initial proposals for landscape and nature conservation do you particularly like or dislike?

QUESTION 5.2: Which of the recreational activities do you consider most important?

5.4.1 Low Activity Scenario

The aim of the low activity scenario is to provide improved access to the area by walking and cycling, with an emphasis on promoting a quiet environment for wildlife and informal recreation (such as birdwatching).

Figure 5.2 shows a masterplan for this activity scenario illustrating the location and scale of provision:

- New footpaths, cycle ways and bridleways could form a circuit around the reservoir and provide improved links to established networks in the surrounding area.
- It may be possible to provide a new cycle way along the route of the pipeline, helping to link Havant Thicket with the partially complete Emsworth to Christchurch cycle route (National Cycle Route 2).
- Nature conservation measures could include the replacement of, and creation of new woodland

and grassland habitat for animals such as reptiles, bats and dormice.

- The wetland wildlife area could attract a wide range of species such as water vole, great crested newt, heron, and moorhen. The wetland is located on the northern edge of the reservoir in order to take advantage of the shallow waters, feeder streams and proximity of woodland habitat.
- There is no additional car parking proposed with this scenario

5.4.2 Medium Activity Scenario

The aim of the medium activity scenario is to provide improved access to the site by walking and cycling, with the emphasis on providing a quiet environment, while also providing some additional play, education and improved recreation facilities for angling and bird watching.



Figure 5.2: Low Activity Scenario - this drawing is reproduced in Volume 2 at A3

Figure 5.3 shows a masterplan for this activity scenario illustrating the location and scale of provision:

- A visitor / education centre is shown located on the northern bank of the reservoir where it would have excellent views across the reservoir.
- Given that there are existing visitor facilities to the south of the reservoir in Staunton Country Park, the location of the visitor centre to the north provides an alternative information point and opportunity for a break for people walking around the reservoir.
- A play area for young children could be provided next to the visitor / education centre, where adults would easily be able to supervise.
- A wind turbine providing power for the visitor / education centre.
- Car parking associated with access option 1 is shown located in the forest to the north of the

reservoir, utilising an area of land that has already been clear felled. This area is close to the access road from the B2149 and the proposed location for the visitor / education centre. Tree planting would be undertaken as part of the landscaping of a new car parking area. For access option 2 the car parking would be located to the north of existing woodland to the north-west of the reservoir.

5.4.3 High Activity Scenario

The aim of the high activity scenario is to provide for larger numbers of visitors with facilities for a wide range of water sports including sailing and swimming, a larger visitor / education centre, opportunity for events, and for a research facility.

Figure 5.4 shows a masterplan for this activity scenario illustrating the location and scale of provision:

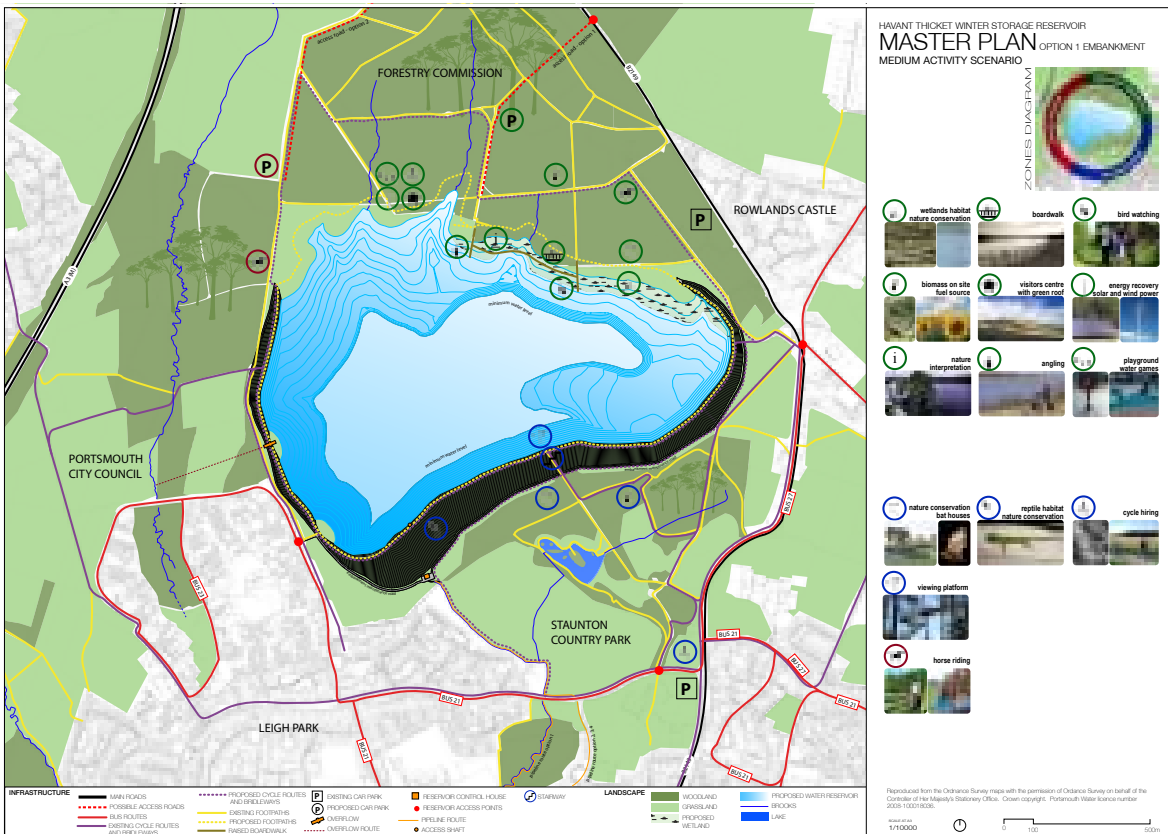


Figure 5.3: Medium Activity Scenario - this drawing is reproduced in Volume 2 at A3



Havant Thicket Winter Storage Reservoir

- A beach is shown located at the north western edge of the reservoir in order to take advantage of the shallow waters and southerly aspect. This location will also help limit disturbance to the wetlands conservation area located to the east.
- A research centre, which could be used by Colleges and Universities for research on e.g. freshwater ecology
- A floating island could be created to provide extra protection for wildlife, including nesting.
- Sports facilities such as a watersports centre and skate park are located away from the conservation area to the north east.
- A woodland adventure trail (incorporating treetop walkways and rope slides) could be provided in the forest to the north of the visitor centre.
- Additional car parking could be split between the area identified to the north of the reservoir

(see medium activity scenario), and a smaller additional parking area close to the watersports centre at the western edge of the site.

- A semi-natural amphitheatre, which is located on an exposed area of the embankment. This could potentially be used for activities such as open air cinema or theatre performances.

QUESTION 5.3: Which of the three levels of activity do you prefer overall?

QUESTION 5.4: What improvements would you suggest to your preferred level of activity?



Figure 5.4: High Activity Scenario - this drawing is reproduced in Volume 2 at A3



Chapter 6 - Next Steps

6.1 Further Work

A Report on Community and Stakeholder Involvement will be prepared at the end of the consultation (summer 2008) to summarise the comments, ideas and suggestions received, and describe how these are being addressed and developed as Portsmouth Water take forward the proposals.

At the next stage (mid-2008 to mid-2009 - see Table 6.1), Portsmouth Water will develop a detailed design for the reservoir, incorporating relevant ideas and suggestions from the consultation. This will involve continual testing and amendment in response to the Environmental Impact Assessment which will be undertaken in parallel to the design process.

The Environmental Impact Assessment will require preparation of a Scoping Report and consultation with specific bodies to ensure that the appropriate issues will be addressed. Related work on a Design and Access Statement, Transport Assessment and Environmental Management Plan will also take place at this time, involving specific stakeholders to assess issues and potential solutions.

Newsletters and the website will keep local people and organisations informed of progress through to formal submission.

6.2 Submission of Planning Application

The formal submission of proposals is currently expected to take place by mid-2009. Notice will be given via letters, the newsletter and the website of the date for formal submission of the proposals at least two months before the due date so that individuals and organisations can plan ahead.



Table 6.1 Next Steps

Calendar		Planning Stage	Consultation Opportunities
February		Pre - application Period before the planning application is submitted. Environmental Impact Assessment Site Investigation Road Traffic Assessment	Consultation Report published
2008	March - April		Exhibition 8 th -10 th , 12 th -18 th March & Workshop, 29 th March
	May - July		Report on Community and Stakeholder Involvement
	July - December		Newsletters and website providing update on design Newsletters and website providing update on design
2009	January - April	Planning application An application is submitted to Havant Borough Council and East Hants District Council. The reservoir will have been designed in detail. Outline plans of proposed recreation and educational facilities will be provided.	All the application drawings and reports will be available to the public. Everybody has the opportunity to make comments on the application prior to the Council's making their final decisions.
	May - June		It will take several months for Havant Borough Council and East Hampshire District Council to consider the application and consultation responses. A decision on the proposals may be reached by the end of 2009.
	July - December		
2010-2013		Subsequent applications Further applications will have to be submitted to Havant Borough Council and East Hants District Council. These will provide the detailed designs of recreation and educational facilities.	All the application drawings and reports will be available to the public. Everybody has the opportunity to make comments on the applications to the Council.
2013-2015		Preparatory works Further site investigations; Habitat creation and species re-location; Removal of woodland & advanced planting prior to construction.	
2015-2018		Construction	
2018-2020		Completion Removing construction equipment and clearing-up; filling of reservoir during winter periods.	