



Development Consent Order

Application Reference Number: WW010001

Documents for Certification September 2014

We, Lindsay Speed and Sarah Fairbrother hereby certify that this is a true copy of the environmental statement referred to in Article 61 (1) (f) of the Thames Water Utilities Limited (Thames Tideway Tunnel) Order 2014.

Lindsay Speed

Sarah Fairbrother

September 2014

**Thames
Tideway Tunnel**



Creating a cleaner, healthier River Thames

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Environmental Statement

Doc Ref: **6.2.06**

Volume 6: Barn Elms figures

APFP Regulations 2009: Regulation **5(2)(a)**

Hard copy available in
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January 2013

Thames
Tideway Tunnel 
Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Environmental Statement

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Thames Tideway Tunnel
Environmental Statement
Volume 6 Barn Elms site assessment

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Thames Tideway Tunnel

Environmental Statement

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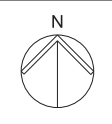
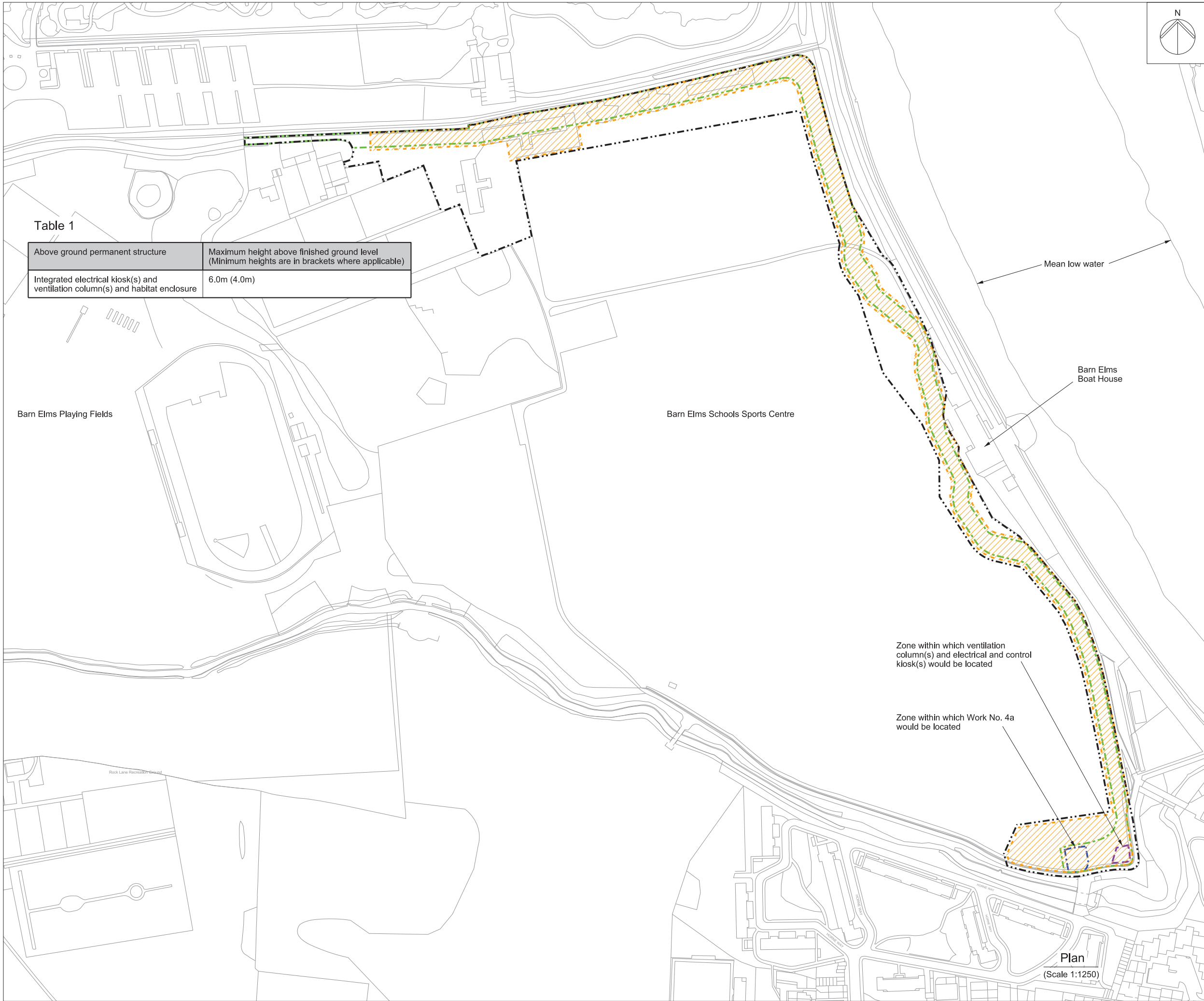
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1 Plans from the Book of Plans

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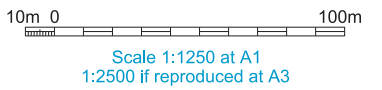
Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Table 1

Above ground permanent structure	Maximum height above finished ground level (Minimum heights are in brackets where applicable)
Integrated electrical kiosk(s) and ventilation column(s) and habitat enclosure	6.0m (4.0m)

- Key:
- Limits of land to be acquired or used (LLAU)
 - Zone within which all permanent site structures would be located
 - Zone within which the shaft would be located
 - Zone within which permanent above ground structures would be located (those listed in Table 1)
 - Zone within which required landscaping would be located

- Notes:
- All dimensions and levels are approximate.
 - The Site Works Parameter Key Plan identifies each zone independently.
 - The zone within which the shaft would be located would include all permanent works including shaft walls (including appropriate allowances for construction tolerances) and if applicable under-reaming. Shaft construction temporary works may be located within or outside this zone provided they are located within the Limits of land to be acquired or used.



FOR APPROVAL

Location
Barn Elms
 London Borough of Richmond Upon Thames

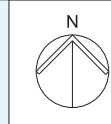
Document Information
Application for Development Consent
 Site works parameter plan

Book of plans - section 7
 DCO-PP-04X-BAREL-070008
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Plan
 (Scale 1:1250)



Matchline: Sheet 2



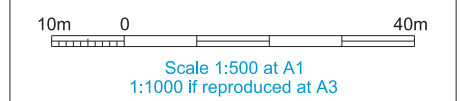
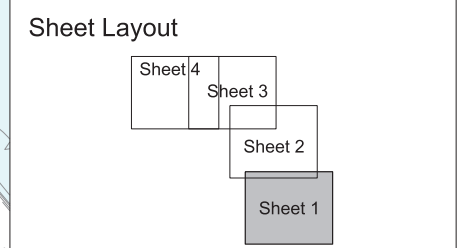
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- Key:**
-  Limits of land to be acquired or used (LLAU)
 -  Trees to be pruned

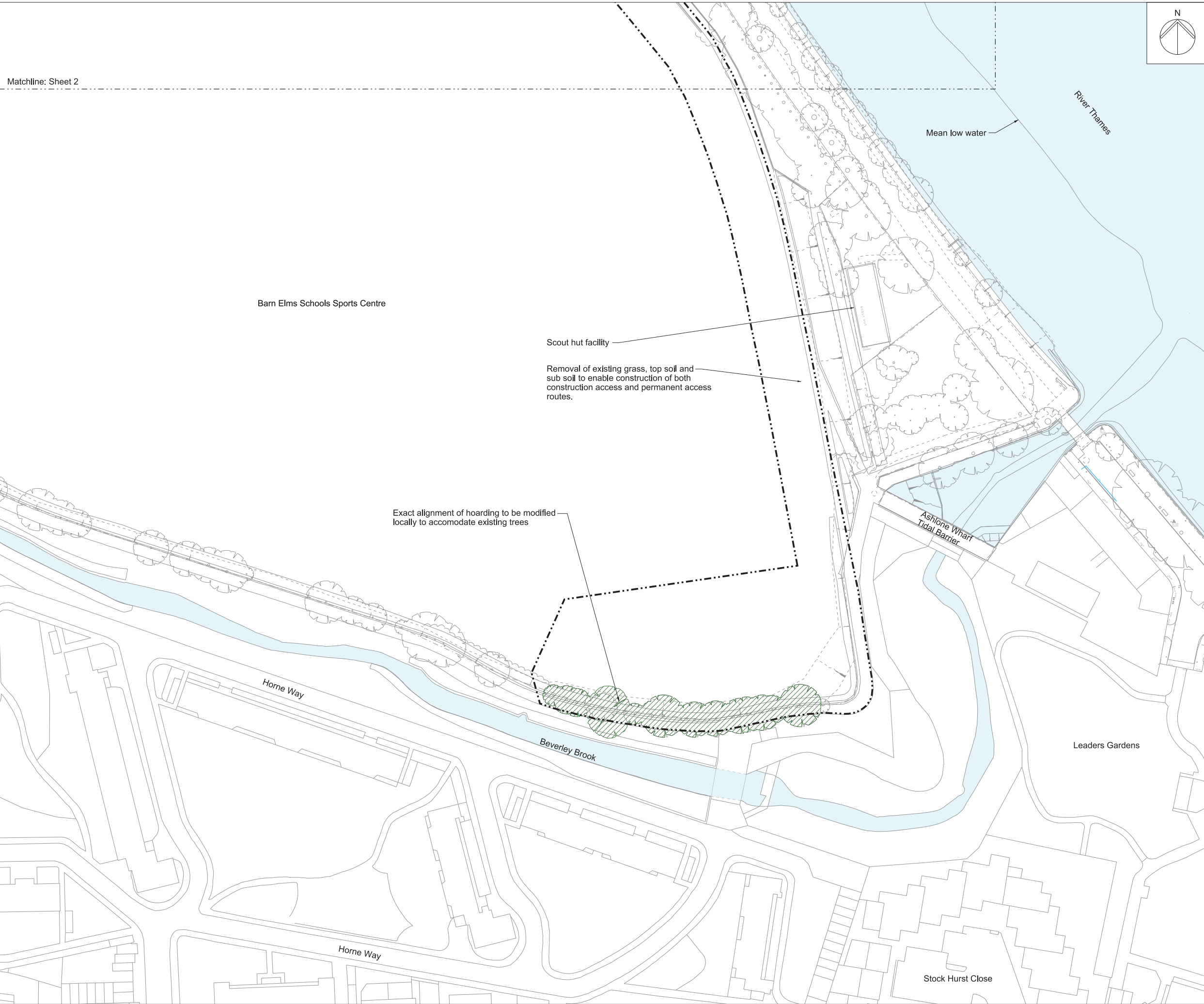
- Notes:**
1. Temporary construction access route to be enclosed on both sides by secure fencing approximately 2.4m high.
 2. Demolition and site clearance shown for construction access only.
 3. Minor items to be removed (e.g. barriers, bollards etc.) are not shown.
 4. General activities of site clearance such as removal of hardstanding and foundations, stripping of topsoil and clearance of minor vegetation not shown.

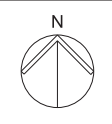


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Location
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Document Information
Application for Development Consent
Demolition and site clearance
Sheet 1 of 4
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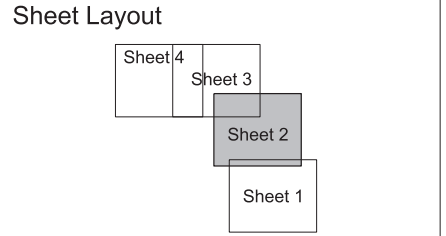
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 - Trees to be removed
 - Trees to be pruned

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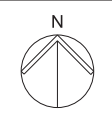


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Application for Development Consent
 Demolition and site clearance
 Sheet 2 of 4
 Book of plans - section 7
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 January 2013





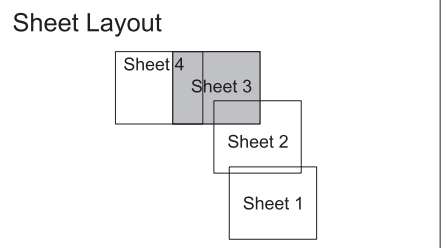
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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Trees to be removed
 - Trees to be pruned
 - Structure to be removed and relocated or reinstated

- Notes:**
1. Temporary construction access route to be enclosed on both sides by secure fencing approximately 2.4m high.
 2. Demolition and site clearance shown for construction access only.
 3. Minor items to be removed (e.g. barriers, bollards etc.) are not shown.
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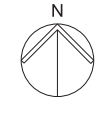


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Application for Development Consent
 Demolition and site clearance
 Sheet 3 of 4
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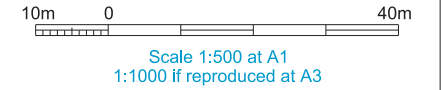
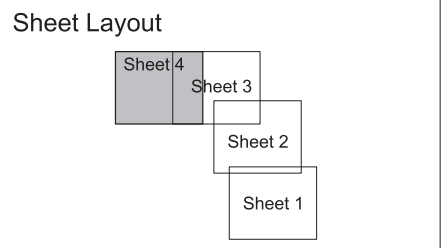
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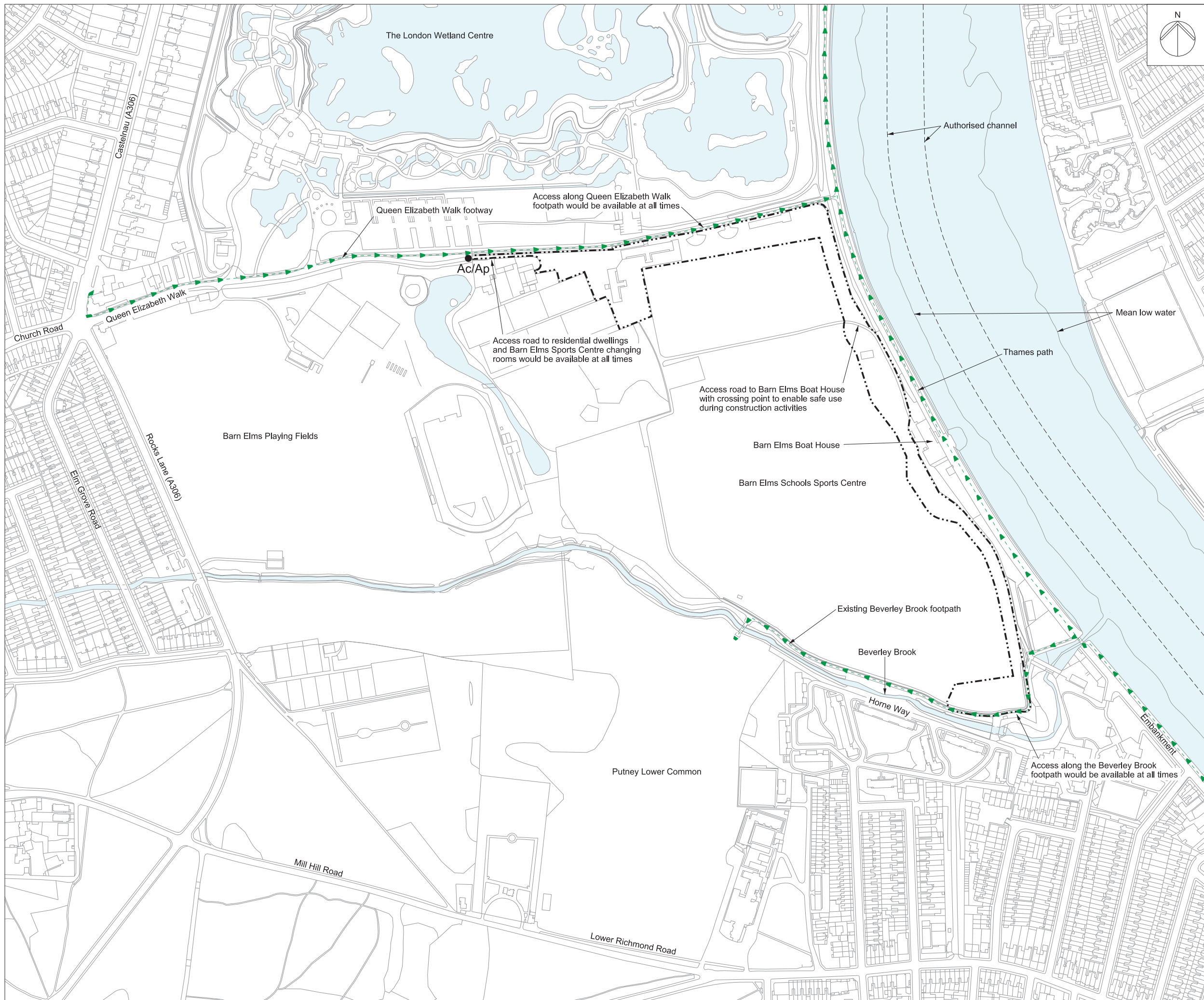
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Location
Barn Elms
 London Borough of Richmond Upon Thames

Document Information
Application for Development Consent
 Demolition and site clearance
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 Book of plans - section 7
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Matchline: Sheet 3



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Keyplan:

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Key:

- Limits of land to be acquired or used (LLAU)
- Existing public right of way
- Ap ● Access to permanent works
- Ac ● Access to construction works

Notes:

- This plan does not show stopping up and diversions of limited duration (eg hoarding erection, minor utility diversions and minor highway works).
- Only rights of way in or close to worksites are shown. The full extents of rights of way are not shown where they cease to be relevant to the project.

100m 0 100m
Scale 1:2000 at A1
1:4000 if reproduced at A3

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Location
Barn Elms
London Borough of Richmond Upon Thames

Document Information
Application for Development Consent
Access plan

Book of plans - section 7
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January 2013

Thames Tideway Tunnel
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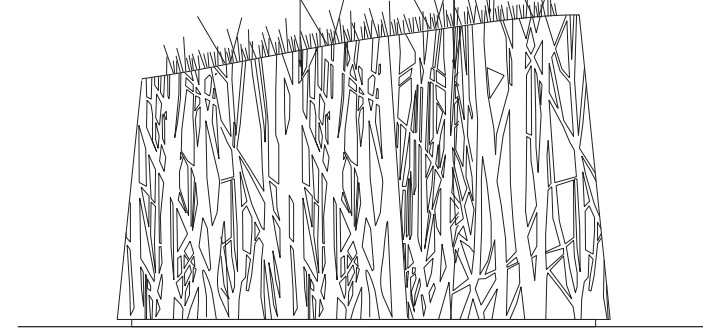
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Notes:
1. All dimensions and levels are approximate.

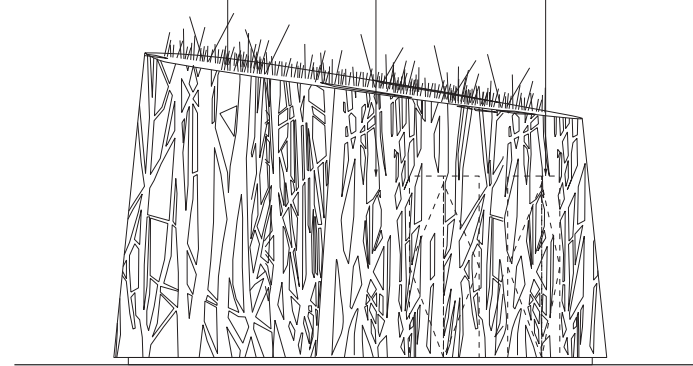
Openings within habitat enclosure cladding to be filled with suitable media to attract different species of animals and invertebrates. Exact media to be agreed



South elevation

Scale 1:50

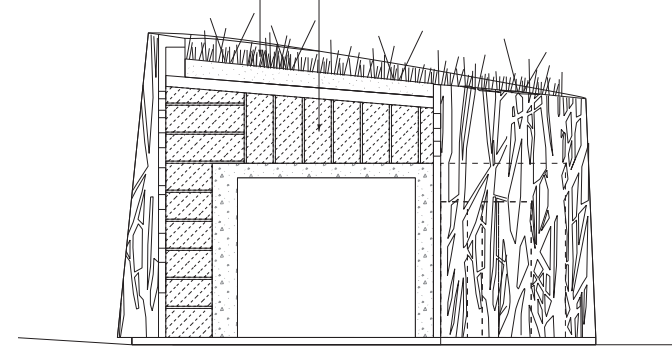
Planted brown roof
Concrete or metal cladding
Concealed doors to match cladding pattern



North elevation

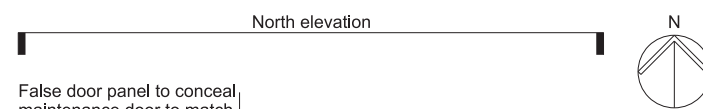
Scale 1:50

Planted brown roof
Birds, bats and invertebrae habitat shelves with suitable media. Shelves shown notionally. Actual shelf sizes and configuration to suit animal species to be agreed



Section

Scale 1:50



False door panel to conceal maintenance door to match existing cladding

Maintenance door

Electrical and mechanical room

Ventilation room

Fair faced in-situ concrete cast structure

Rainwater downpipe

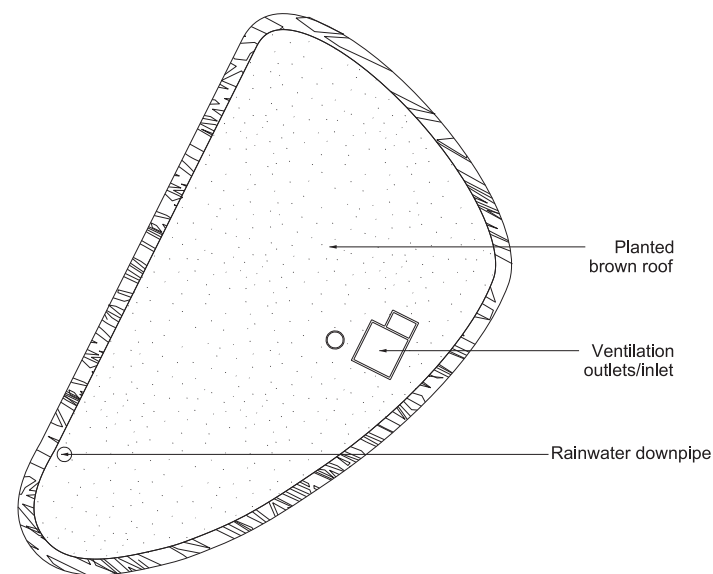
Birds and invertebrae habitat shelves with suitable media. Shelves shown notionally. Actual shelf sizes and configuration to suit animal species to be agreed



South elevation

Floor plan

Scale 1:50



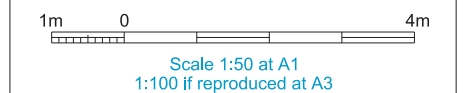
Planted brown roof

Ventilation outlets/inlet

Rainwater downpipe

Roof plan

Scale 1:50



INDICATIVE

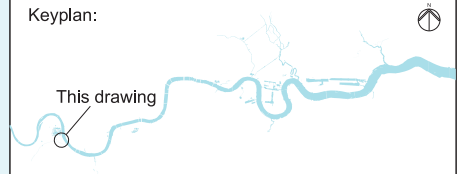
Location
Barn Elms
London Borough of Richmond Upon Thames

Document Information
Application for Development Consent
Kiosk and ventilation column design intent

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January 2013

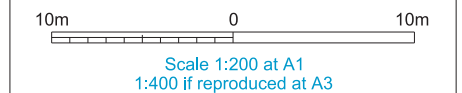


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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Zone within which permanent above ground structures would be located
 - Zone within which required landscaping would be located
 - Maximum extent of foreshore structure
 - Authorised channel
 - + 105.40m Existing levels (shown in metres above tunnel datum)
 - Proposed levels (shown in metres above tunnel datum)
 - Consented development footprint (by others)
 - Listed buildings/structures
 - Approximate position of CSO outlet
 - Existing trees within surveyed area (trunk sizes vary)
 - Proposed trees
 - Thames Water access

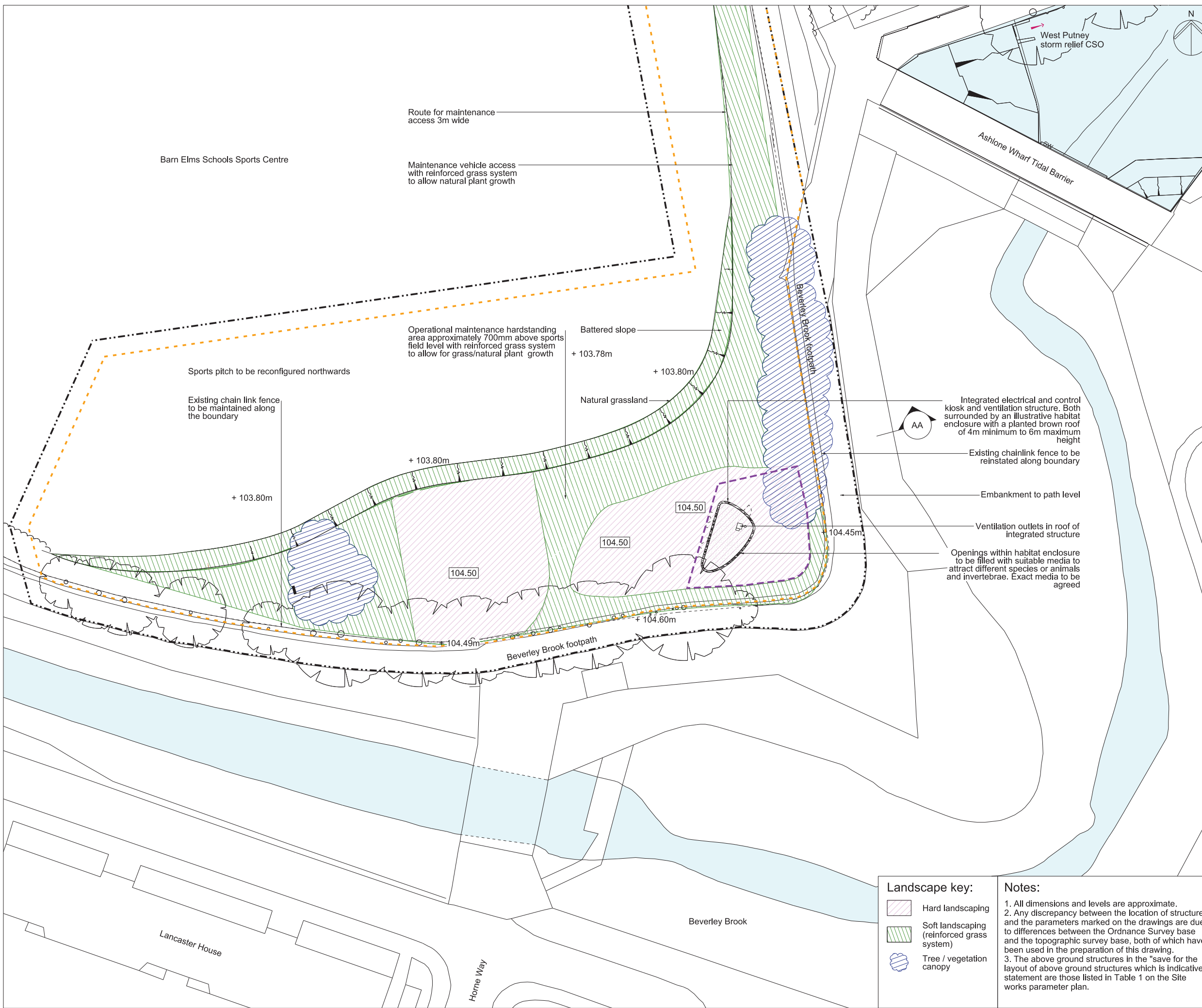


INDICATIVE
Save for layout of above ground structures which is illustrative

Location
Barn Elms
London Borough of Richmond Upon Thames

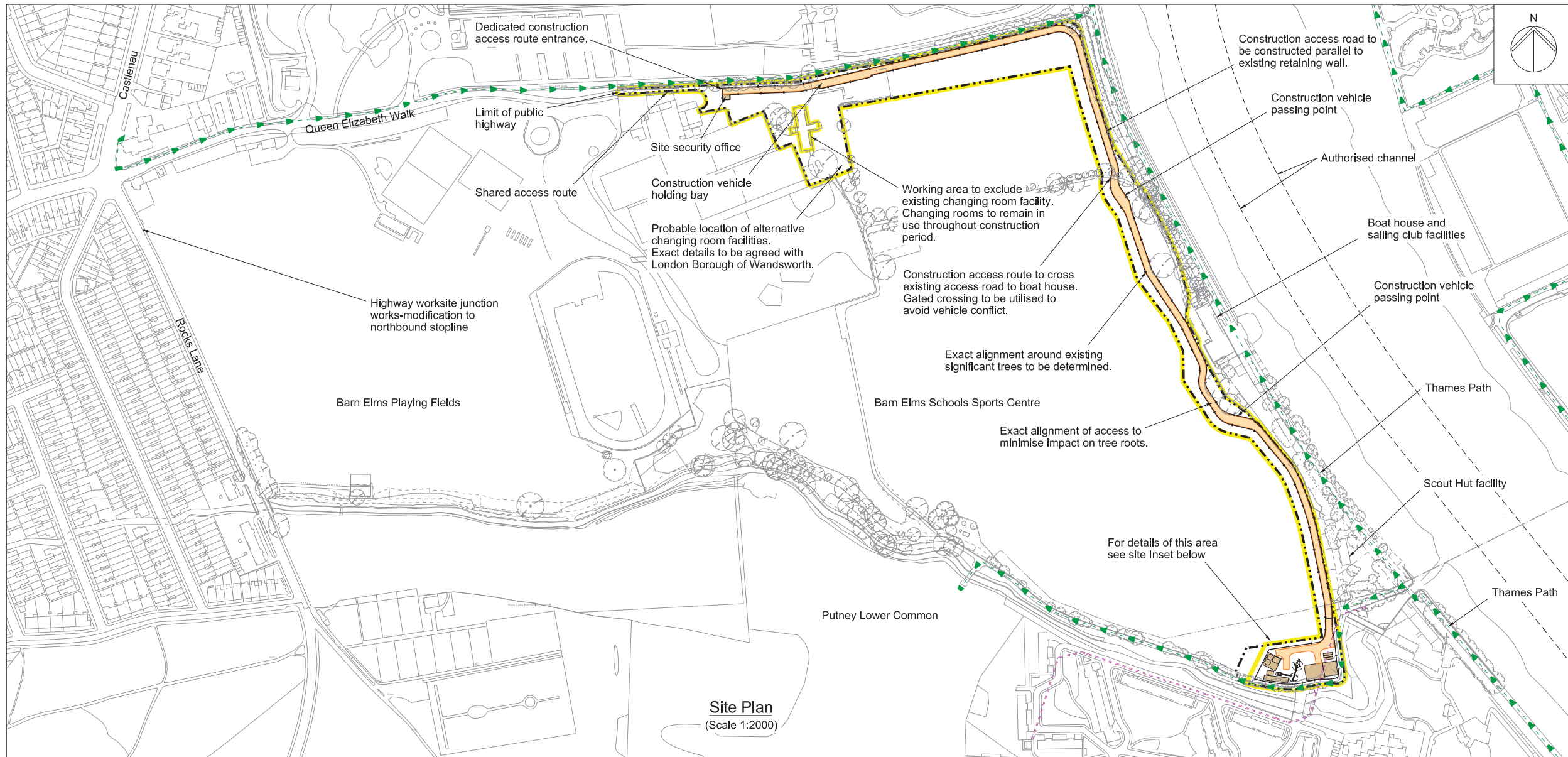
Document Information
Application for Development Consent

Proposed
Landscape plan
Book of plans - section 7
DCO-PP-04X-BAREL-070013
January 2013

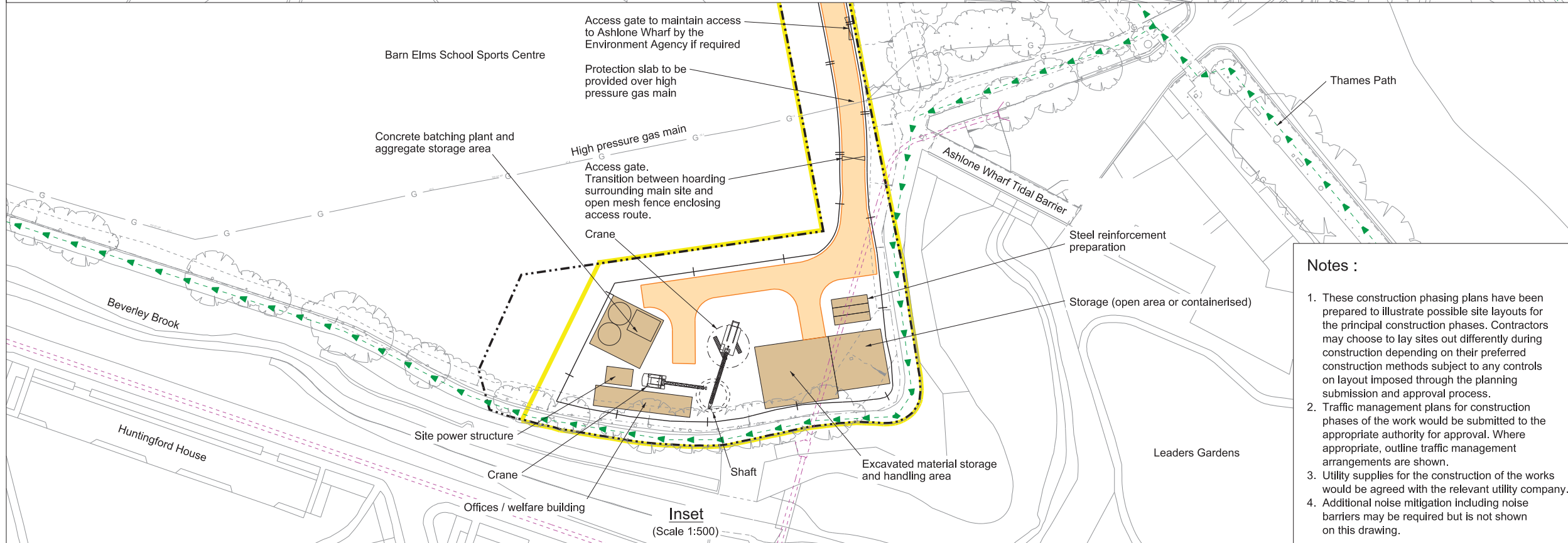


- Landscape key:**
- Hard landscaping
 - Soft landscaping (reinforced grass system)
 - Tree / vegetation canopy

- Notes:**
1. All dimensions and levels are approximate.
 2. Any discrepancy between the location of structures and the parameters marked on the drawings are due to differences between the Ordnance Survey base and the topographic survey base, both of which have been used in the preparation of this drawing.
 3. The above ground structures in the "save for the layout of above ground structures which is indicative" statement are those listed in Table 1 on the Site works parameter plan.



Site Plan
(Scale 1:2000)



Inset
(Scale 1:500)

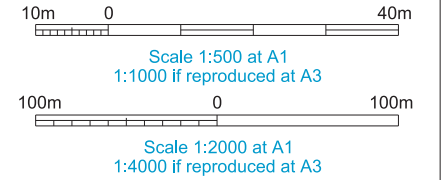
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Key:

	Limits of land to be acquired or used (LLAU)
	Existing public right of way
	Hoarding
	Open mesh fencing
	Maximum extent of working area
	Access / haul route
	Existing sewers



ILLUSTRATIVE

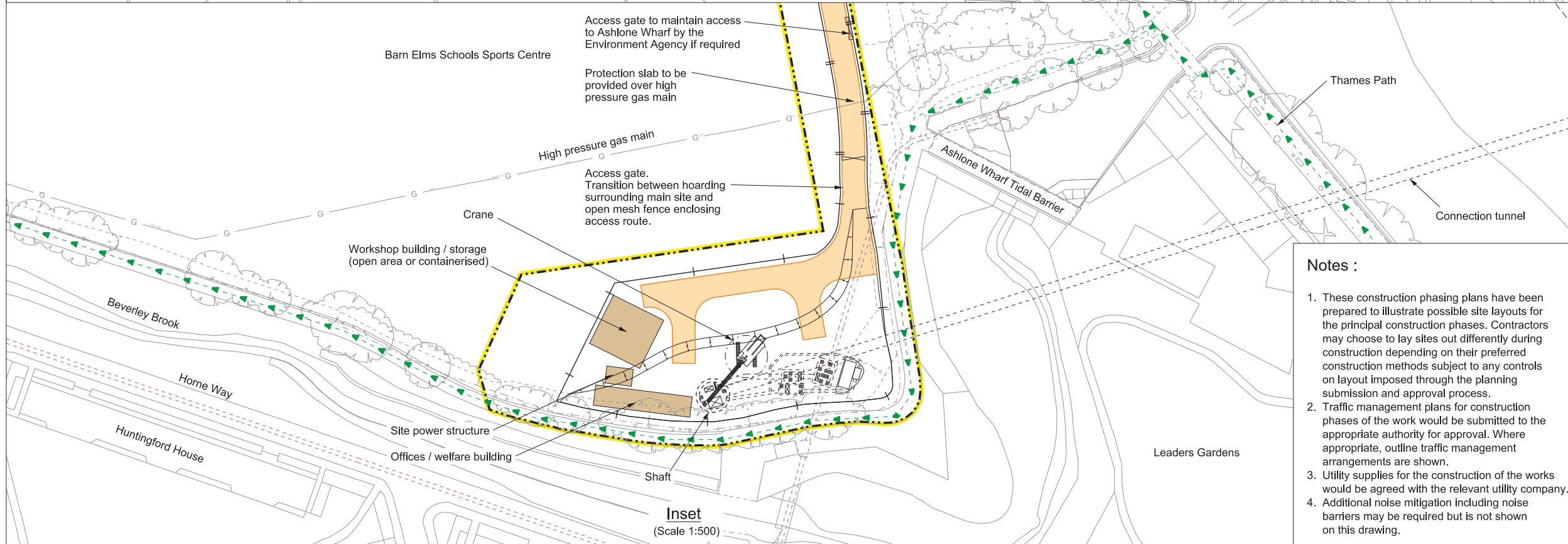
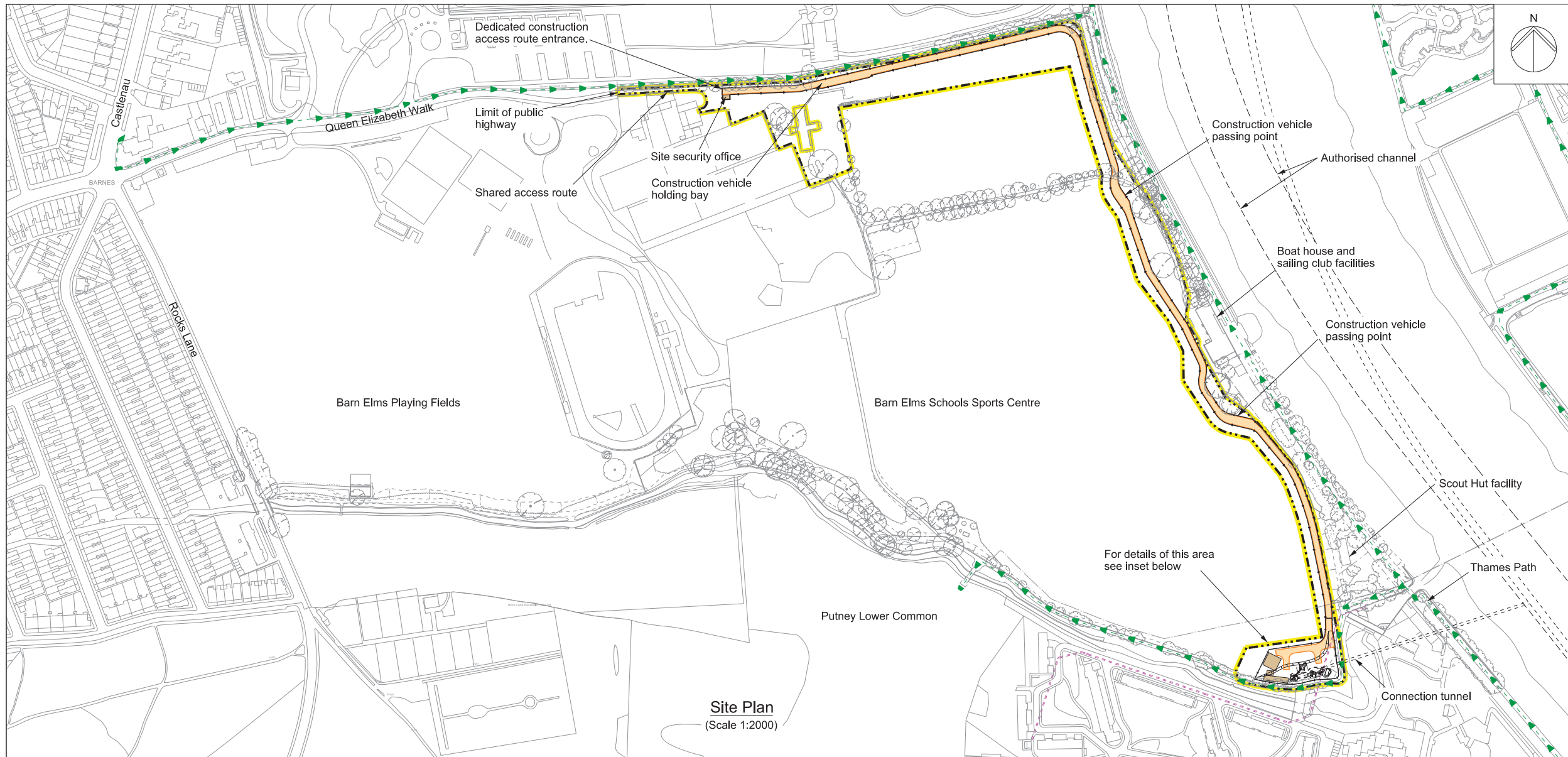
Notes :

1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
2. Traffic management plans for construction phases of the work would be submitted to the appropriate authority for approval. Where appropriate, outline traffic management arrangements are shown.
3. Utility supplies for the construction of the works would be agreed with the relevant utility company.
4. Additional noise mitigation including noise barriers may be required but is not shown on this drawing.

Location
Barn Elms
London Borough of Richmond Upon Thames

Document Information
Application for Development Consent
Construction phases - phase 1
Site setup, shaft construction & tunnelling
Book of plans - section 7
DCO-PP-04X-BAREL-070018
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames



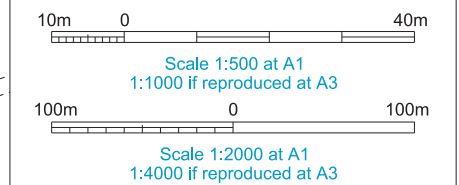
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Key:

	Limits of land to be acquired or used (LLAU)
	Existing public right of way
	Hoarding
	Open mesh fencing
	Maximum extent of working area
	Access / haul route
	Existing sewers



ILLUSTRATIVE

Notes :

1. These construction phasing plans have been prepared to illustrate possible site layouts for the principal construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
2. Traffic management plans for construction phases of the work would be submitted to the appropriate authority for approval. Where appropriate, outline traffic management arrangements are shown.
3. Utility supplies for the construction of the works would be agreed with the relevant utility company.
4. Additional noise mitigation including noise barriers may be required but is not shown on this drawing.

Location
Barn Elms
 London Borough of Richmond Upon Thames

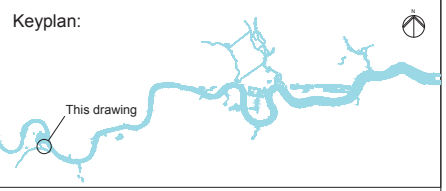
Document Information
Application for Development Consent
 Construction phases - phase 2
 Construction of other structures
 Book of plans - section 7
 DCO-PP-04X-BAREL-070019
 January 2013





Area 1

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Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

- Key**
- Existing
- Parking restrictions
 - Parking spaces
 - Sports centre changing room facilities
 - Bollard
 - Gate
- Revised
- Limit of land to be acquired or used (LLAU)

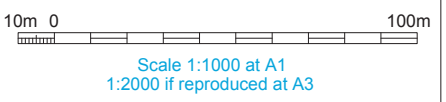
On street parking

Private parking - for Barn Elms sports centre

- Standards**
- Design Manual For Roads And Bridges, Dft, 1992
 - Traffic Signs Regulations & General Directions, Tso, 2002
 - Traffic Signs Manual, Dft, 2006
 - Manual For Streets, Dft, 2007
 - Manual For Streets 2, Cilt, 2010
 - Designing For Deliveries, Fta, 1998
 - Cycle Infrastructure Design Ltn 2/08, Dft, 2008
 - Design Of Pedestrian Crossings Ltn 2/95, Dft, 1995
 - Guidance For The Use Of Tactile Paving, Dft, 1998
 - Accessible Bus Stop Design Guidance, TfL, 2006

Stage

Existing & construction base case

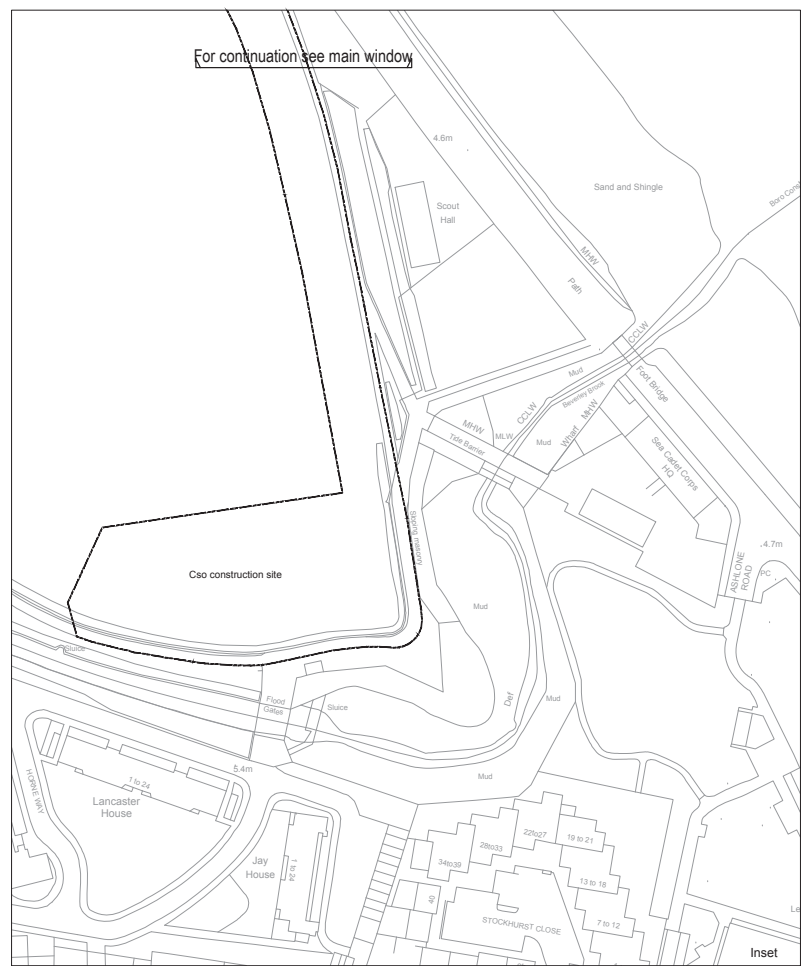


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond Upon Thames

Document Information
Application for Development Consent
 Existing & construction base case highway layout

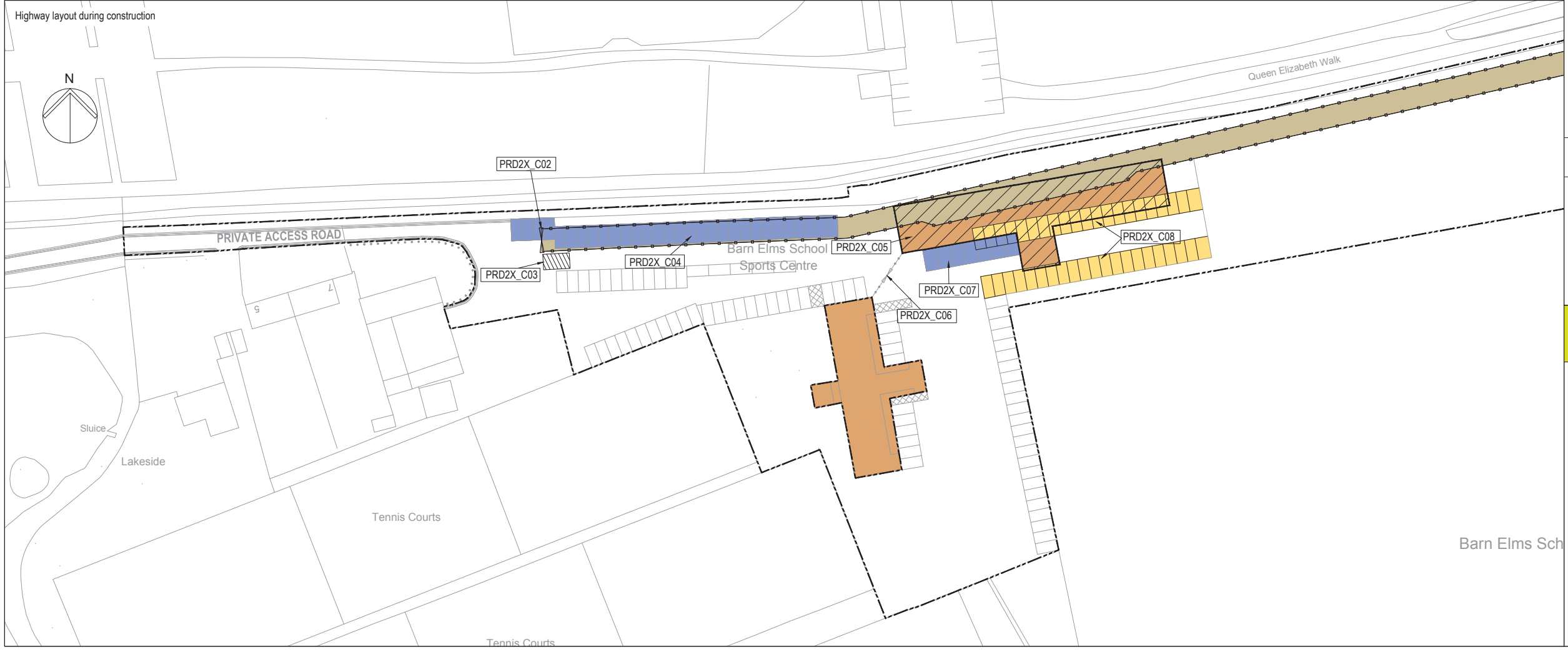
DCO-PP-04X-BAREL-070024
 January 2013



For continuation see main window

For continuation see inset

Barn Elms Schools Sports Centre



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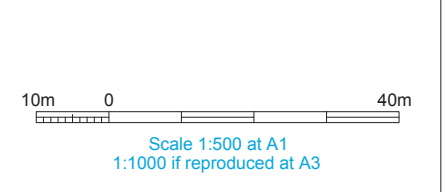
Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key	
Existing	
	Parking restrictions
	Parking spaces
	Sports centre changing room facilities
	Gate
	Bollard
Revised	
	Suspended parking spaces
	Temporary parking spaces
	Illustrative on-site manoeuvring zone
	Building to be demolished
	Site hut
	Site hoarding
	Access gate
	Limit of land to be acquired or used (LLAU)
	See schedule of works

On street parking
Private parking - sports centre parking

- Standards**
- Design Manual For Roads And Bridges, Dft, 1992
 - Traffic Signs Regulations & General Directions, Tso, 2002
 - Traffic Signs Manual, Dft, 2006
 - Manual For Streets, Dft, 2007
 - Manual For Streets 2, Cilt, 2010
 - Designing For Deliveries, Fta, 1998
 - Cycle Infrastructure Design Ltn 2/08, Dft, 2008
 - Design Of Pedestrian Crossings Ltn 2/95, Dft, 1995
 - Guidance For The Use Of Tactile Paving, Dft, 1998
 - Accessible Bus Stop Design Guidance, TfL, 2006

Stage
Phases 1 & 2



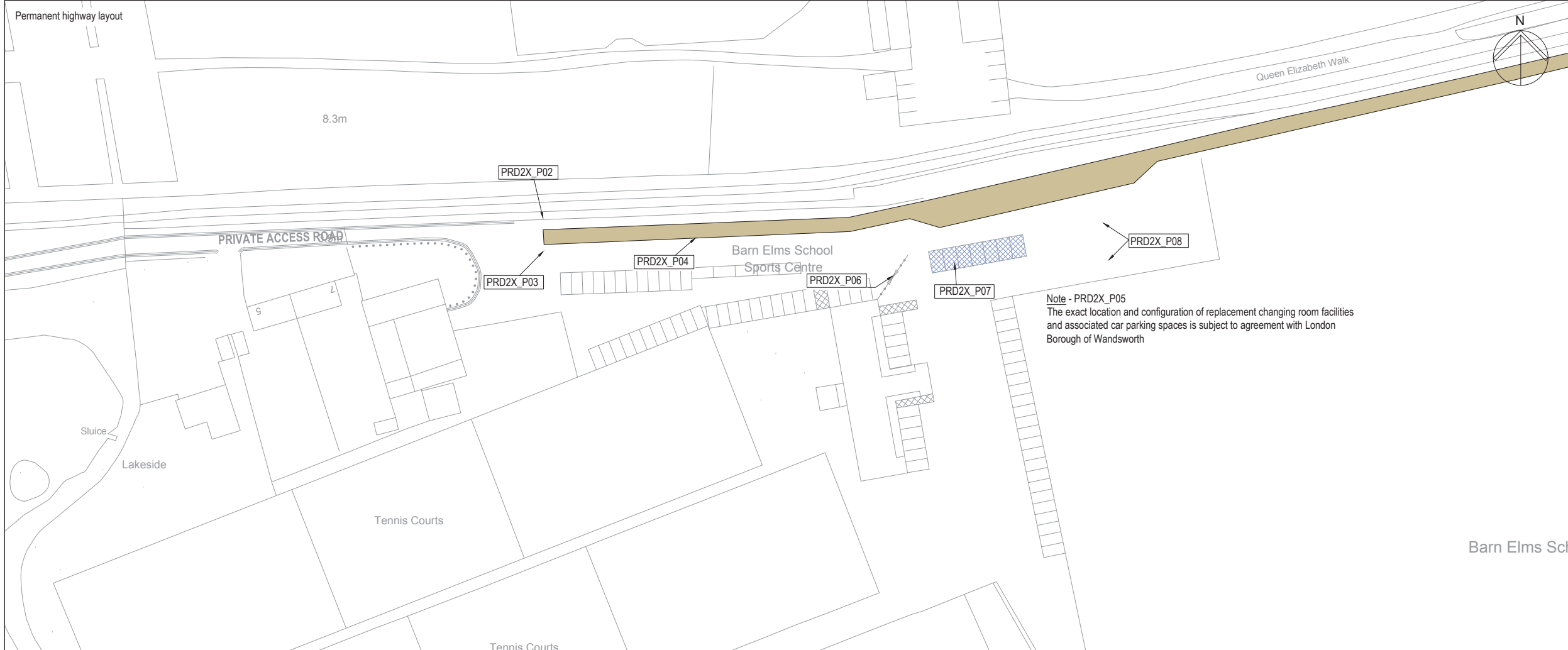
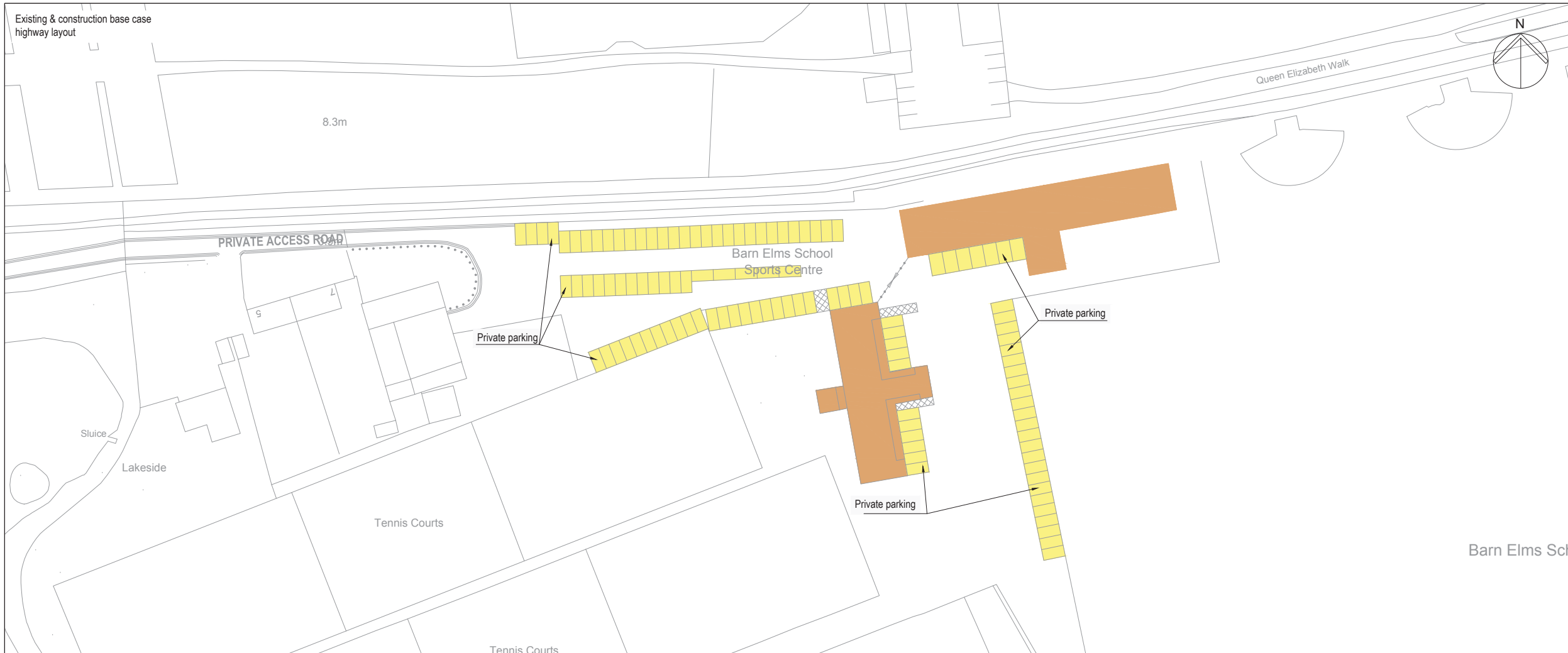
ILLUSTRATIVE

Location
Barn Elms
London Borough of Richmond Upon Thames

Document Information
Application for Development Consent
Highway layout during construction (Area 1)

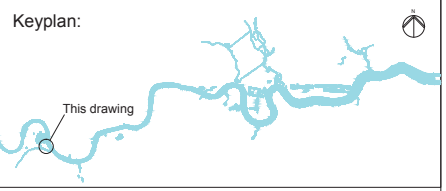
DCO-PP-04X-BAREL-070025
January 2013





Note - PRD2X_P05
The exact location and configuration of replacement changing room facilities and associated car parking spaces is subject to agreement with London Borough of Wandsworth

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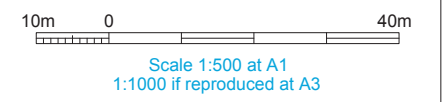
Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key	
Existing	
	Parking restrictions
	Parking spaces
	Sport centre changing room facilities
	Gate
	Bollard
Revised	
	Reinstated parking spaces
	Illustrative on-site manoeuvring zone
	See schedule of works

On street parking
Private parking - sports centre parking

- Standards**
- Design Manual For Roads And Bridges, Dft, 1992
 - Traffic Signs Regulations & General Directions, Tso, 2002
 - Traffic Signs Manual, Dft, 2006
 - Manual For Streets, Dft, 2007
 - Manual For Streets 2, Cih, 2010
 - Designing For Deliveries, Fta, 1998
 - Cycle Infrastructure Design Ltn 2/08, Dft, 2008
 - Design Of Pedestrian Crossings Ltn 2/95, Dft, 1995
 - Guidance For The Use Of Tactile Paving, Dft, 1998
 - Accessible Bus Stop Design Guidance, TfL, 2006

Stage
Permanent phase



ILLUSTRATIVE

Location
Barn Elms
London Borough of Richmond Upon Thames

Document Information
Application for Development Consent
Permanent highway layout
Area 1 work

DCO-PP-04X-BAREL-070026
January 2013



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2 Environmental impact assessment figures

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Keyplan:



Key

- Limits of Land to be Acquired or Used
- Local Authority Boundary
- River Thames

50 25 0 50 m

Scale 1 : 4,000 at A3

FOR INFORMATION

Location

Barn Elms Pumping Station
London Borough of Richmond Upon Thames

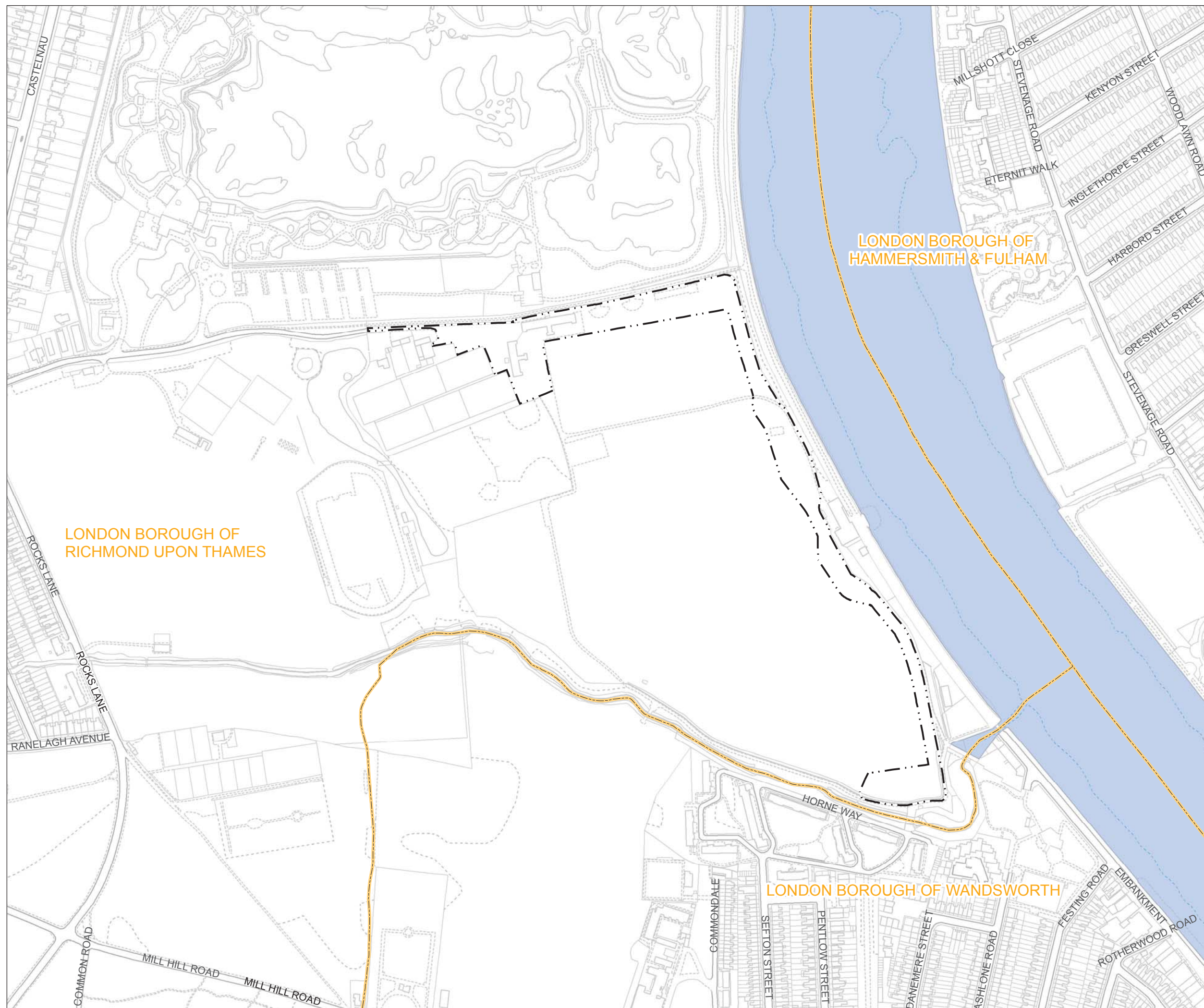
Document Information

Environmental Statement

Site location plan
Vol. 6 Figure 2.1.1

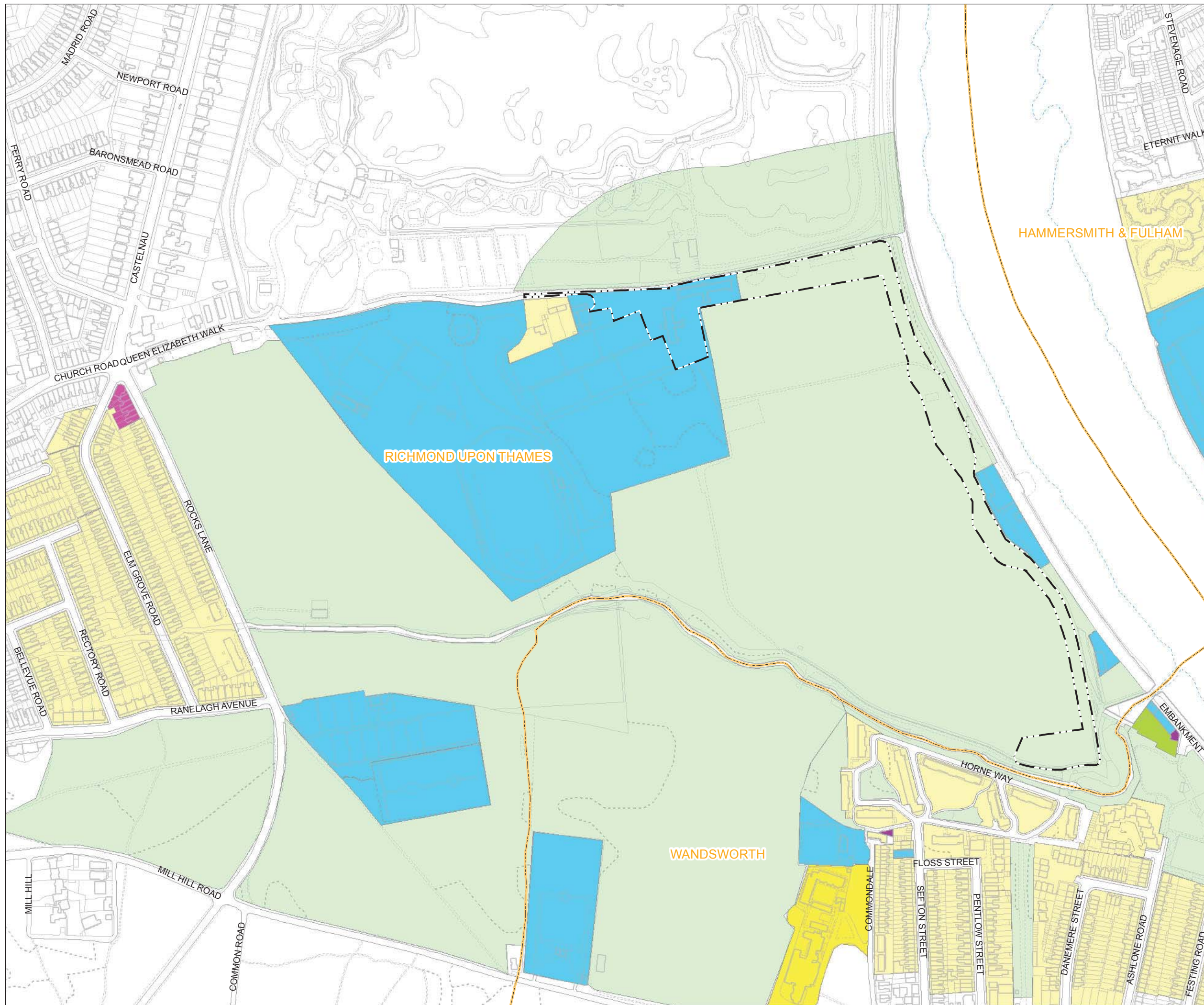
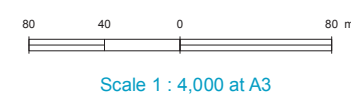
1PL03-MG-00699
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames





- Key**
- Limits of Land to be Acquired or Used
 - Local Authority Boundary
- Land Use**
- Class B1 (Business (Offices except A2) Research and Development, Light Industry)
 - Class C2-C2A (Residential Institutions)
 - Class C3-C4 (Dwelling Houses)
 - Class D1-D2 (Non Residential Institutions (Community Facilities) and Assembly and Leisure)
 - Mixed Use
 - Other
 - Open Space



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

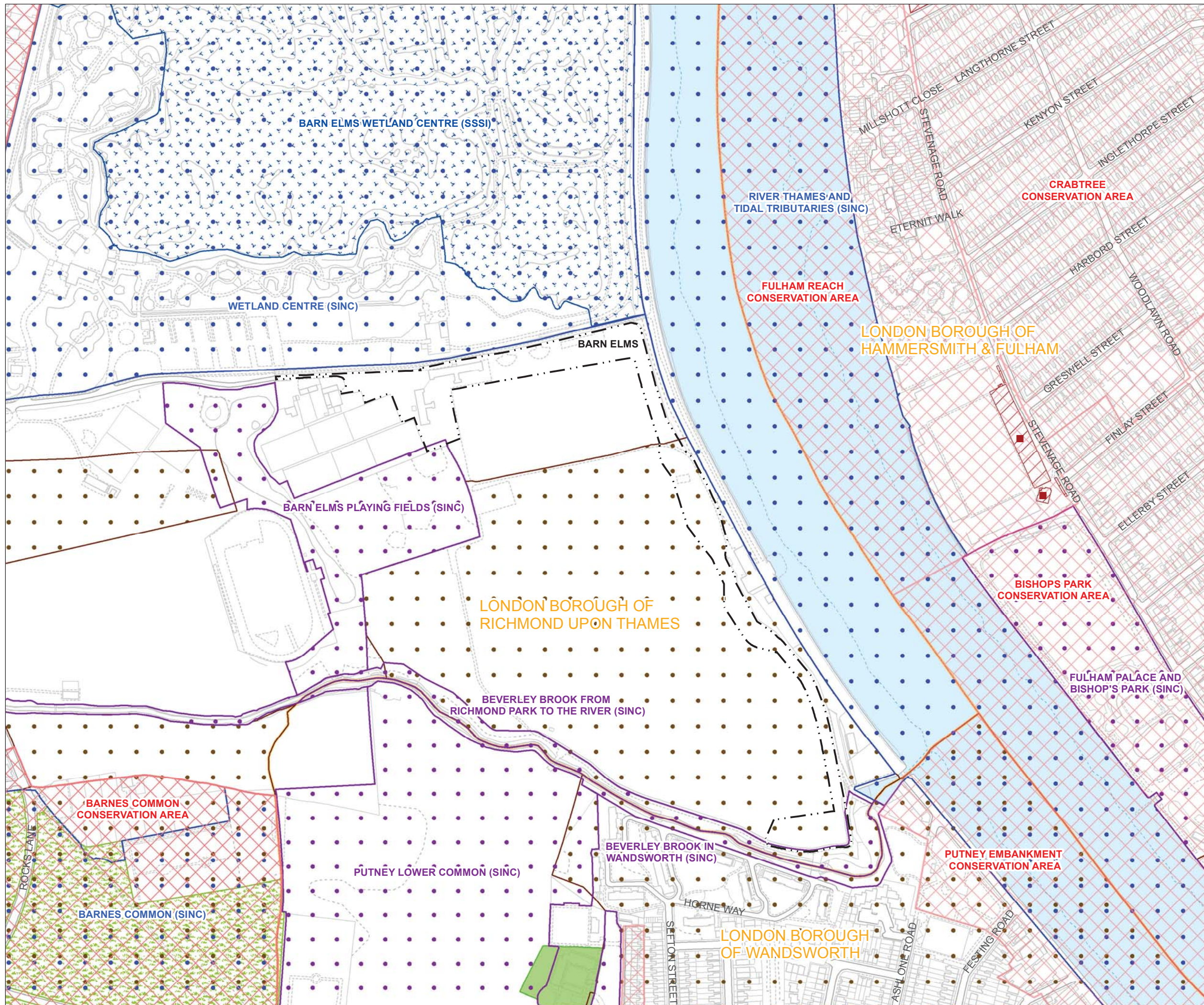
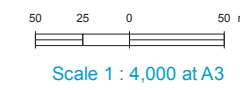
Document Information
Environmental Statement
 Land use
 Vol. 6 Figure 2.1.2

1PL03-MG-00830
 January 2013





- Key**
- Listed Building Point
 - Limits of Land to be Acquired or Used
 - Listed Building Area
 - LPA Conservation Area
 - Tree Preservation Order Area
 - Local Nature Reserve
 - LPA Archaeological Area
 - Site of Special Scientific Interest
 - Local Authority Boundary
 - River Thames
- Sites of Importance for Nature Conservation (SINC)**
- Metropolitan Importance
 - Borough Importance
 - Local Importance



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames





Document Information
Environmental Statement
 Environmental setting
 Vol. 6 Figure 2.1.3

1PL03-MG-00676
 13 Nov 2012

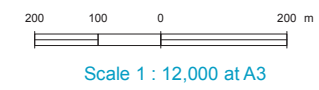


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- Key**
-  Planning Application
 -  Limits of Land to be Acquired or Used
 -  Planning Application (1km Boundary)
 -  Local Authority Boundary

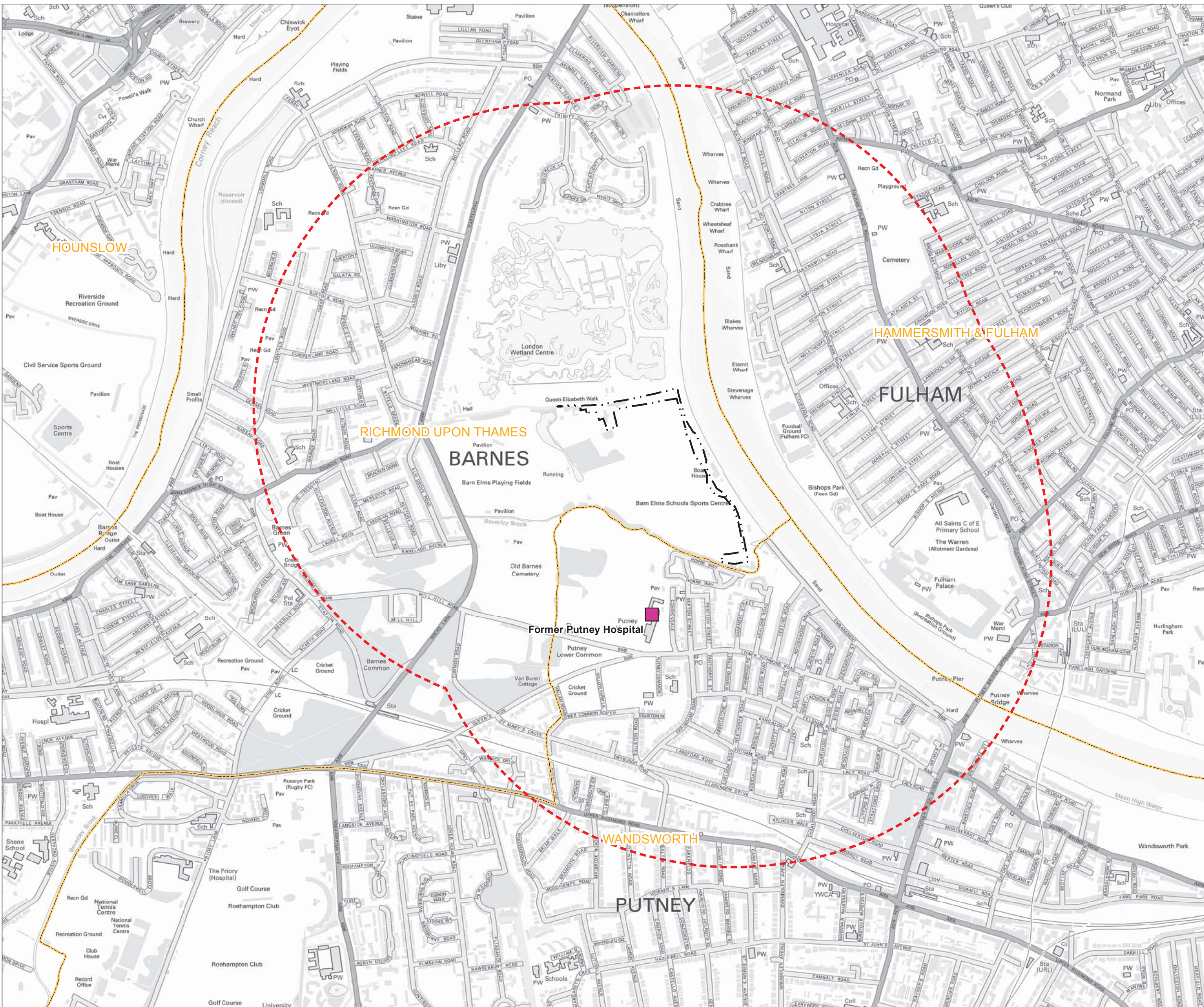
Note: This plan does not show the full extent for each planning application, but a single point within the application site.



FOR INFORMATION

Location
Barn Elms
London Borough of Richmond upon Thames

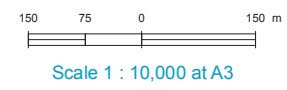
Document Information
Environmental Statement
Base case and cumulative development projects
Vol.6 Figure 3.5.1
1PL03-MG-00722
January 2013



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- Key**
- Limits of Land to be Acquired or Used
 - Existing Local Authority Continuous Monitors
 - Existing Local Authority Diffusion Tubes
 - New Diffusion Tubes (Project)



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - air quality monitoring sites
 Vol.6 Figure 4.4.1
 1PL03-AQ-10783
 January 2013

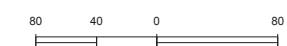
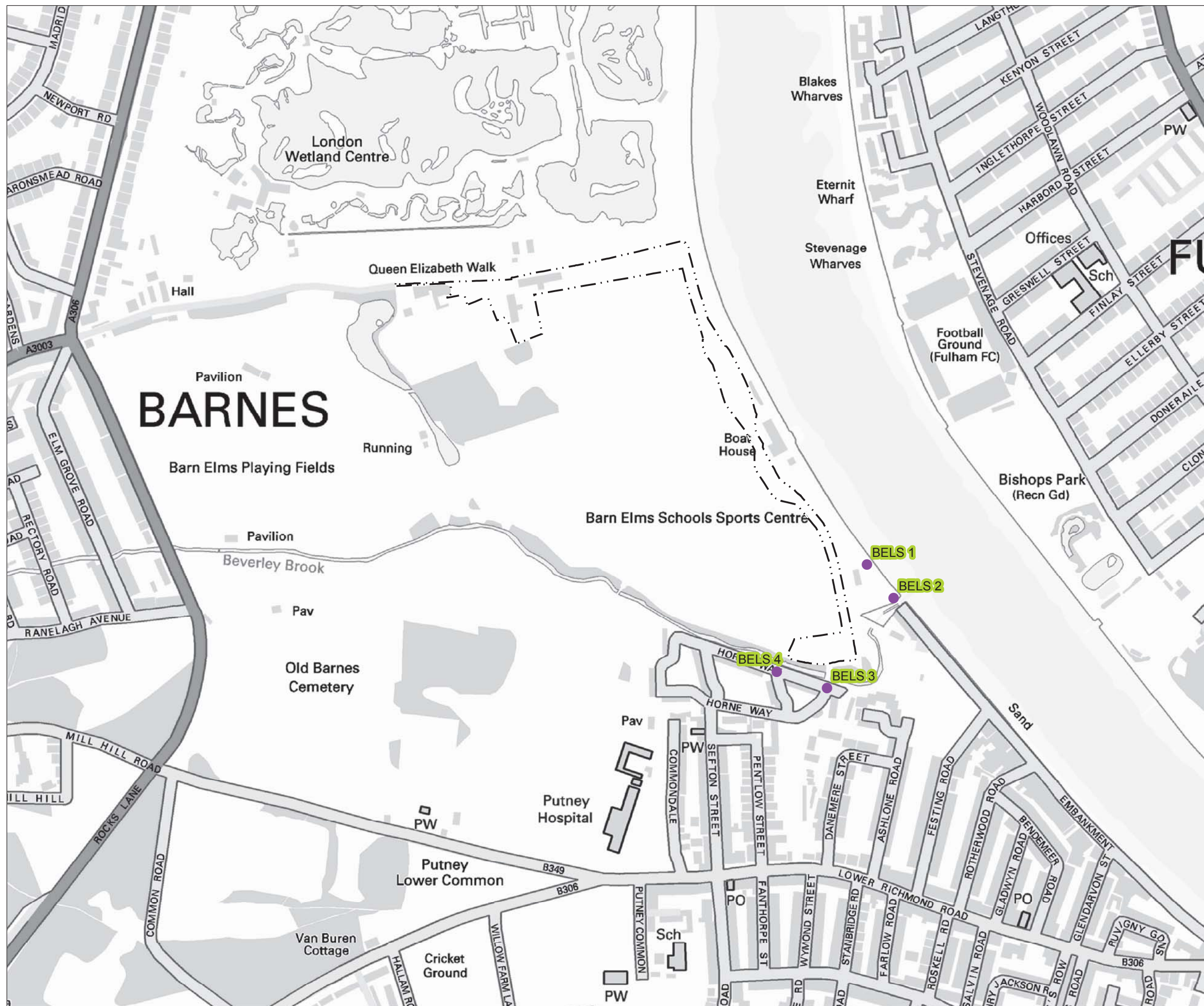


Keyplan:



Key

- Limits of Land to be Acquired or Used
- H₂S Monitoring Locations



Scale 1 : 5,000 at A3

FOR INFORMATION

[Location](#)

Barn Elms
London Borough of Richmond upon Thames

[Document Information](#)

Environmental Statement

Air quality and odour - H₂S monitoring locations

Vol.6 Figure 4.4.2

1PL03-AQ-10784

January 2013



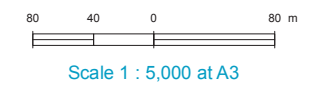


Key

- Limits of Land to be Acquired or Used
- Modelled Receptors

Note: The receptors are selected on the basis that they are representative of sensitive land uses closest to the site.

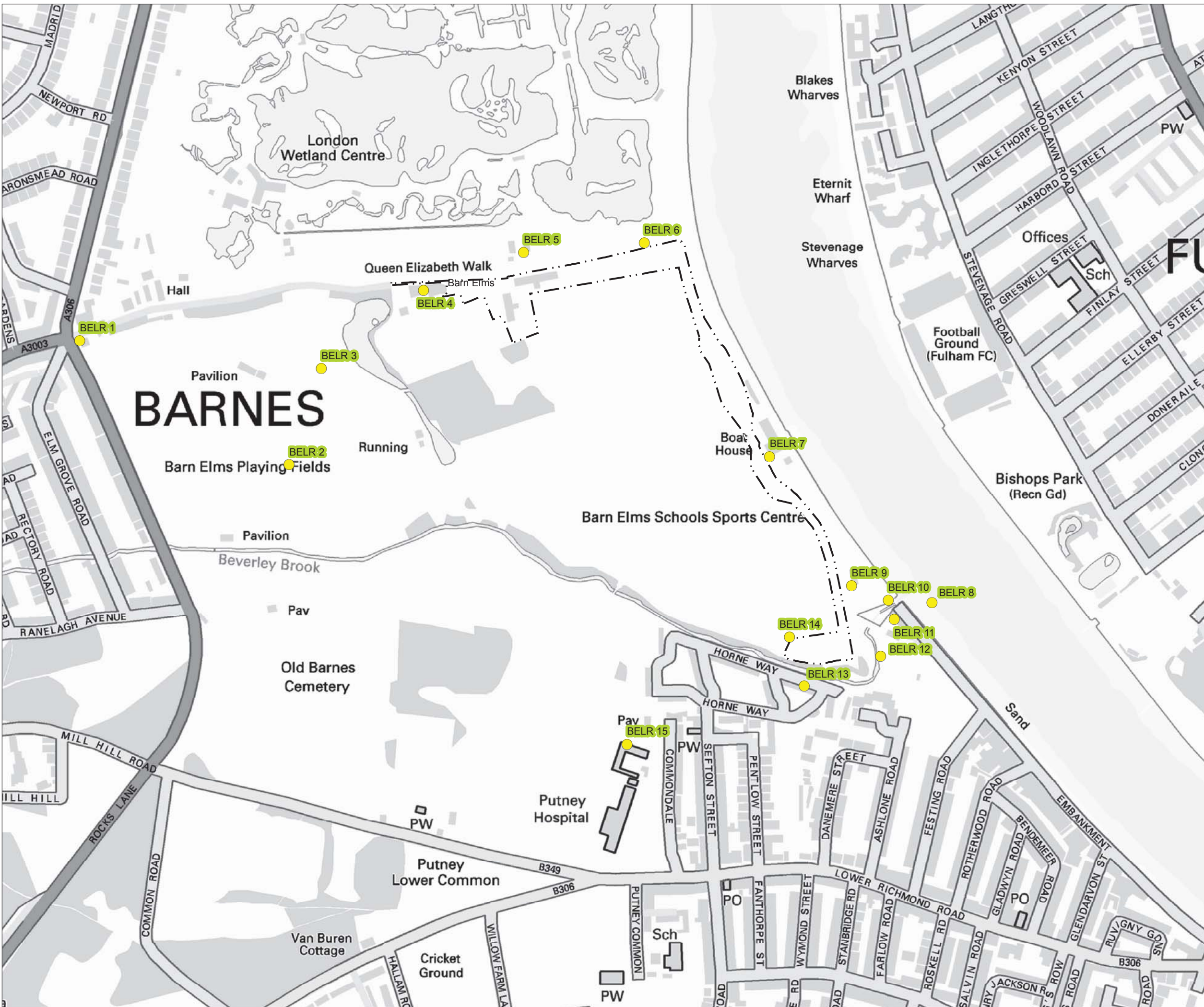
- BELR 1 - The Lodge, Rocks Lane / Queen Elizabeth Walk
- BELR 2 - Barn Elms Sports Centre
- BELR 3 - Barn Elms Playing Fields
- BELR 4 - Residential Properties, Queen Elizabeth Walk
- BELR 5 - London Wetlands Centre
- BELR 6 - Barn Elms Wetland Centre SSSI
- BELR 7 - Barn Elms Boathouse
- BELR 8 - River Thames
- BELR 9 - Scout Hut
- BELR 10 - Thames Path
- BELR 11 - Sea Cadets Corp Unit
- BELR 12 - Leaders Gardens
- BELR 13 - Lancaster House, Horne Way
- BELR 14 - Barn Elms School Sports Centre Playing Fields
- BELR 15 - Former Putney Hospital (Proposed)

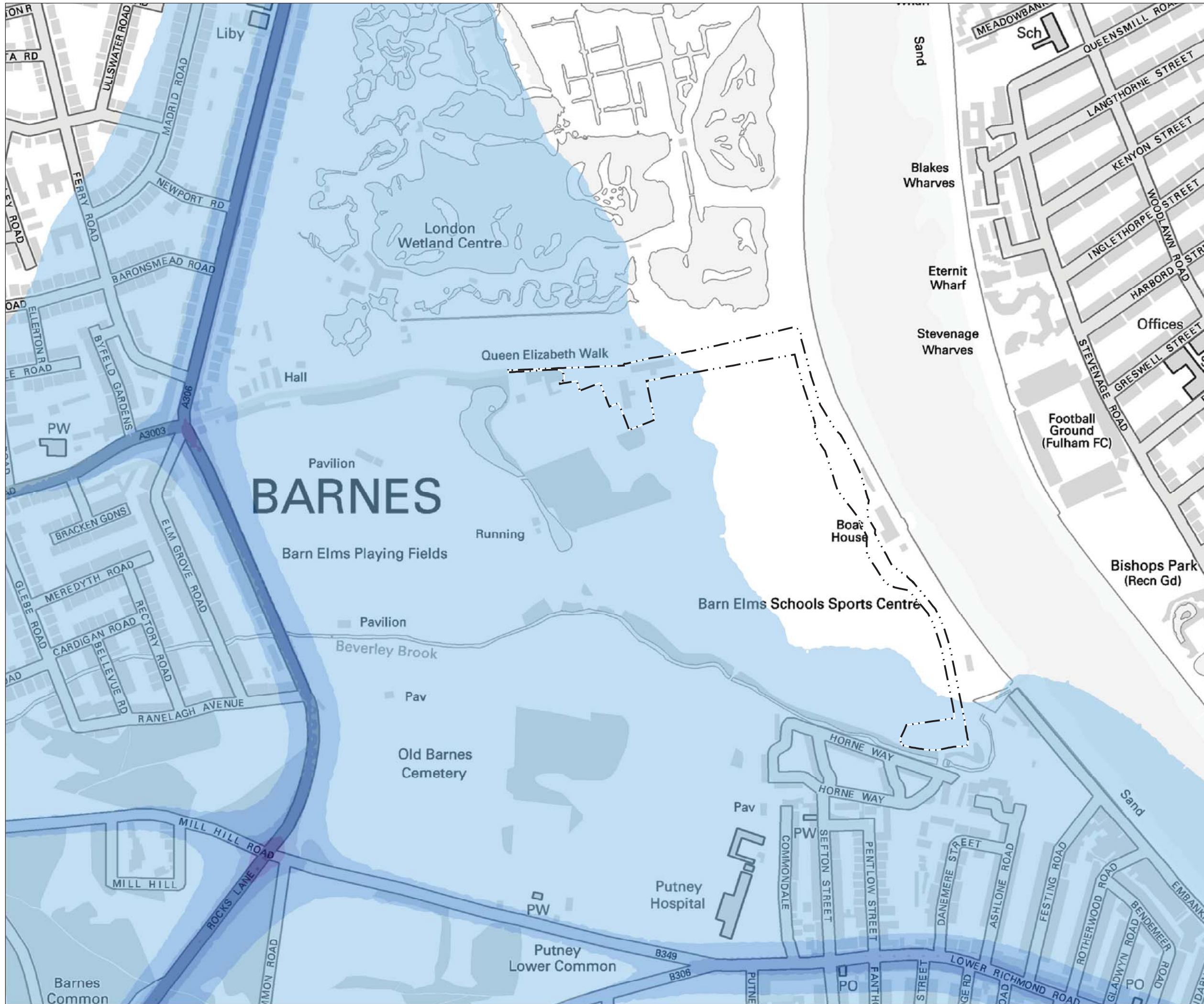


FOR INFORMATION

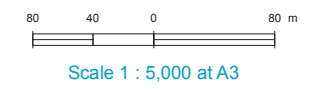
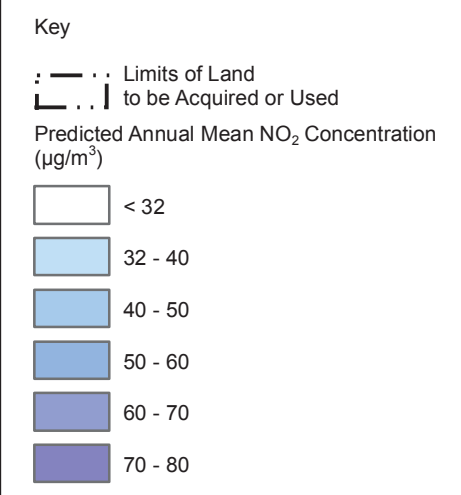
Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - modelled air quality receptors
 Vol.6 Figure 4.4.3
 1PL03-AQ-10785
 January 2013





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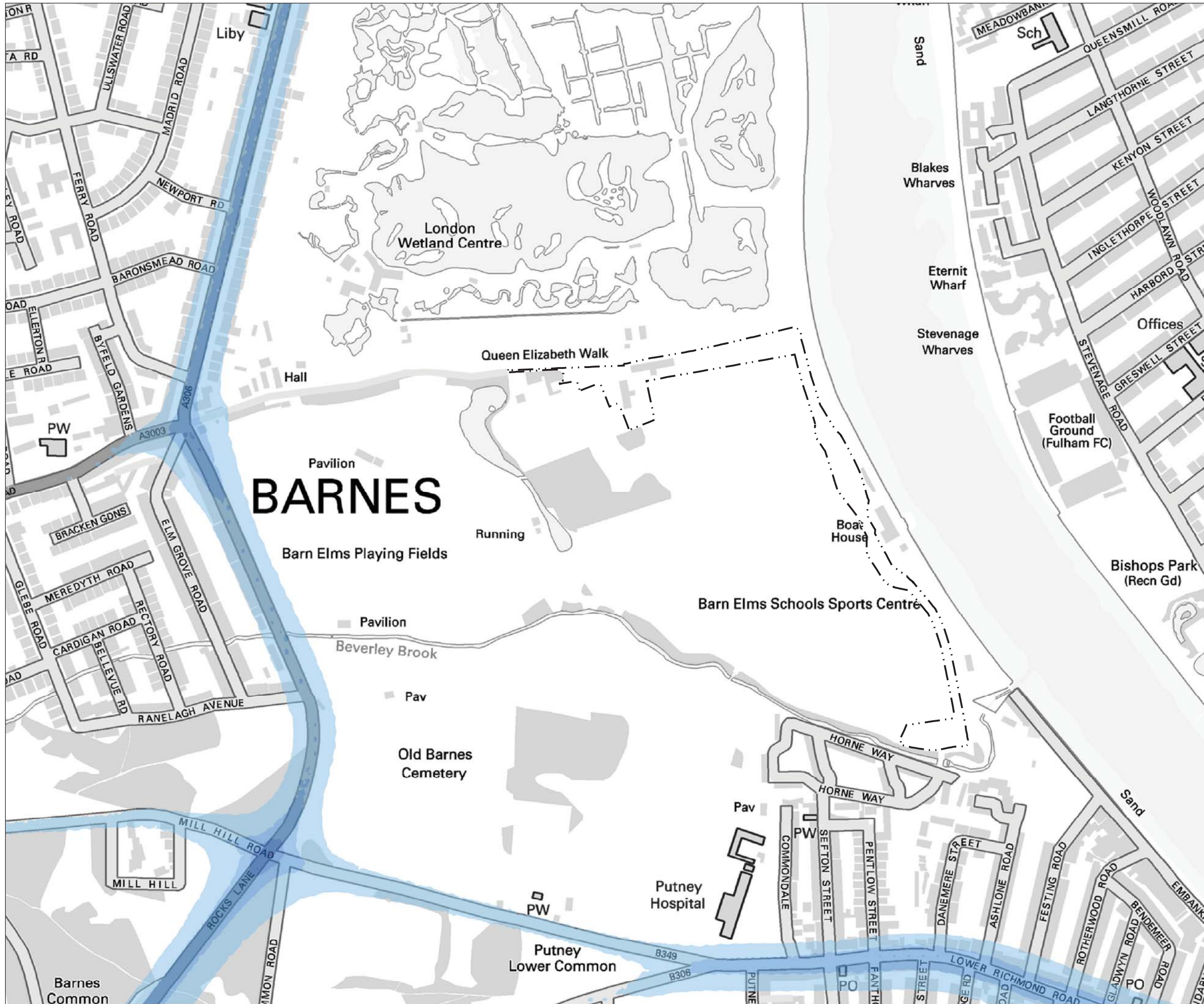


FOR INFORMATION

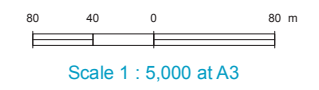
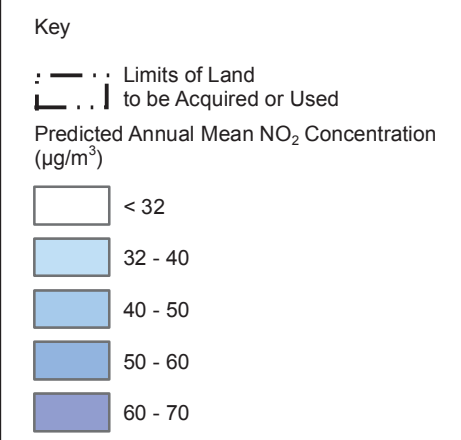
Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - annual mean NO₂ for 2010 baseline
 Vol.6 Figure 4.5.1
 1PL03-AQ-10786
 January 2013





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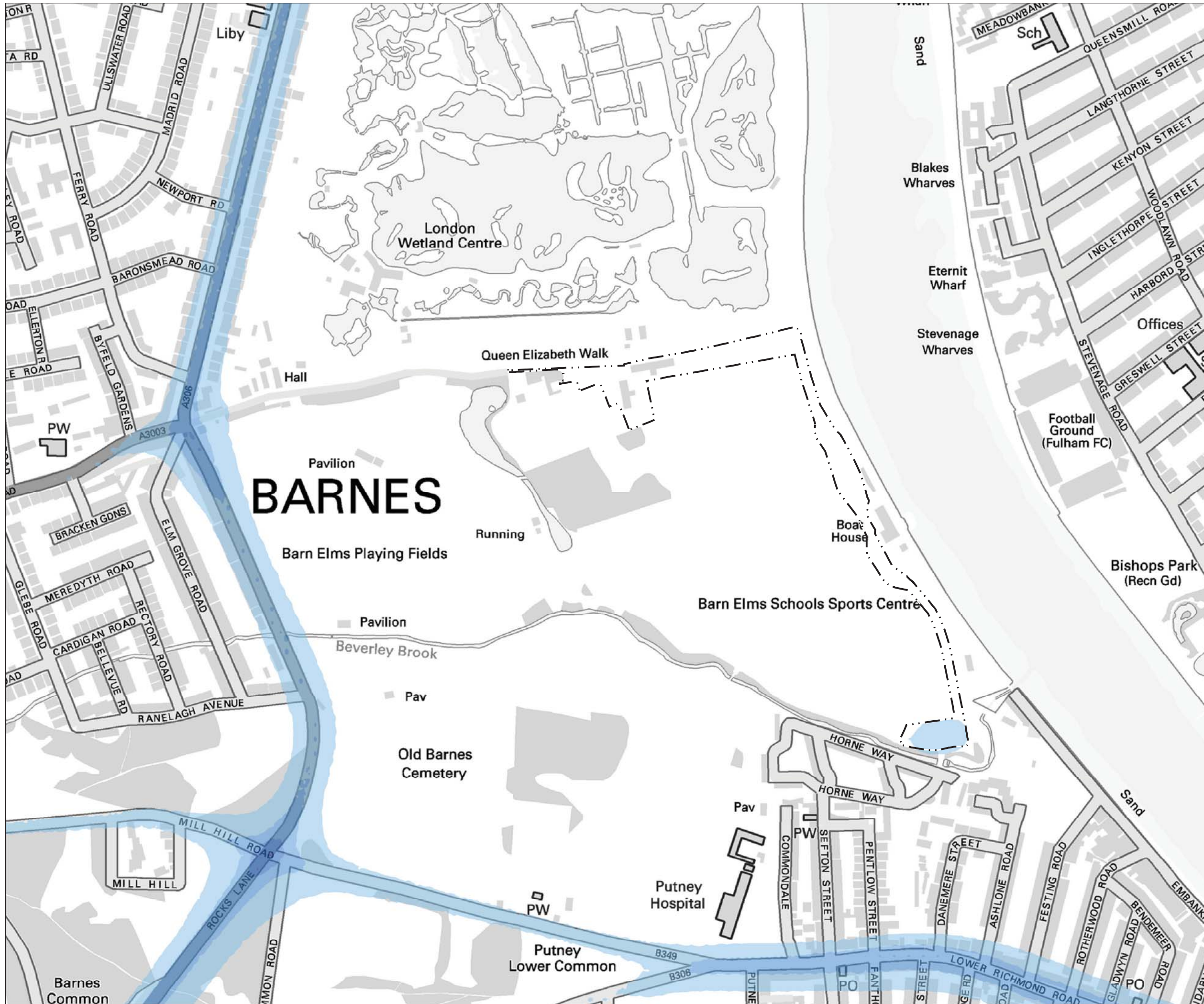


FOR INFORMATION

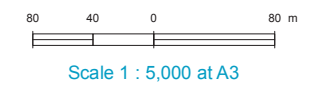
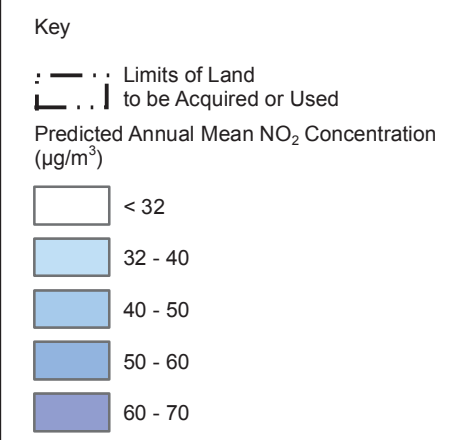
Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - annual mean NO₂ for peak construction year base case
 Vol.6 Figure 4.5.2
 1PL03-AQ-10787
 January 2013





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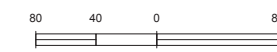
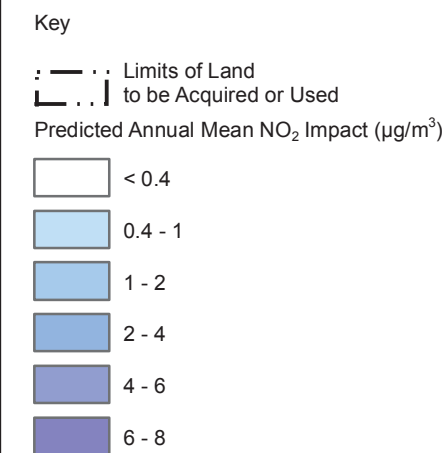


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - annual mean NO₂ for peak construction year development case Vol.6 Figure 4.5.3
 1PL03-AQ-10788
 January 2013





Scale 1 : 5,000 at A3

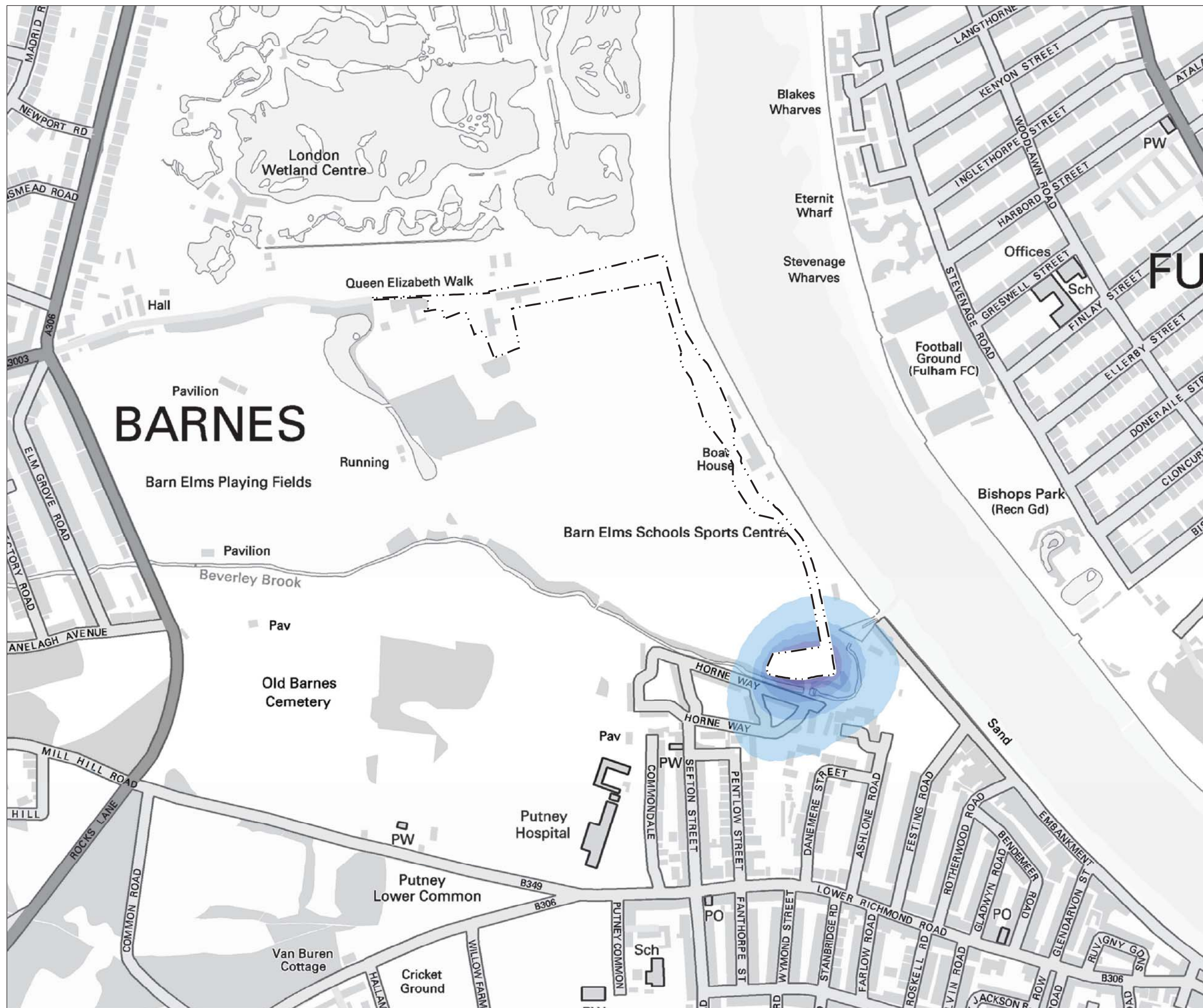
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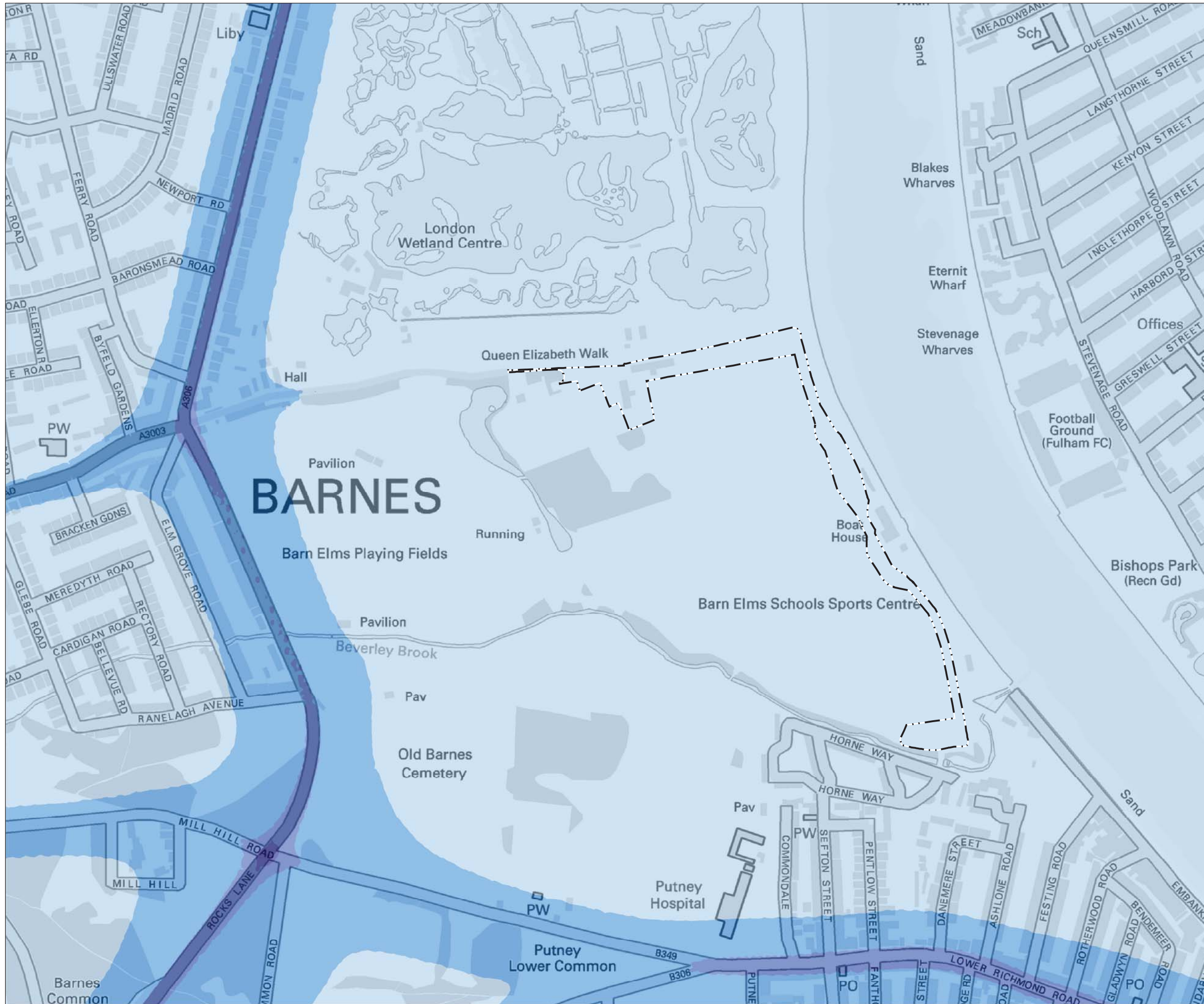
Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement

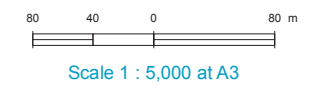
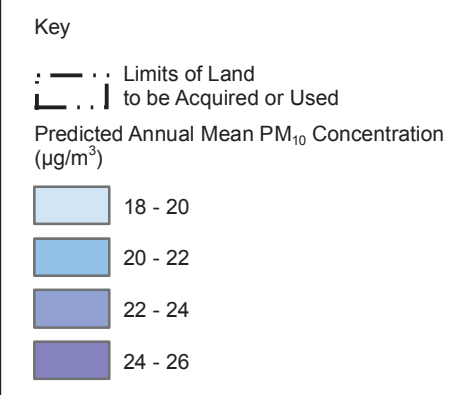
Air quality and odour - annual mean NO₂ impact for peak construction year
 Vol.6 Figure 4.5.4

1PL03-AQ-10789
 January 2013





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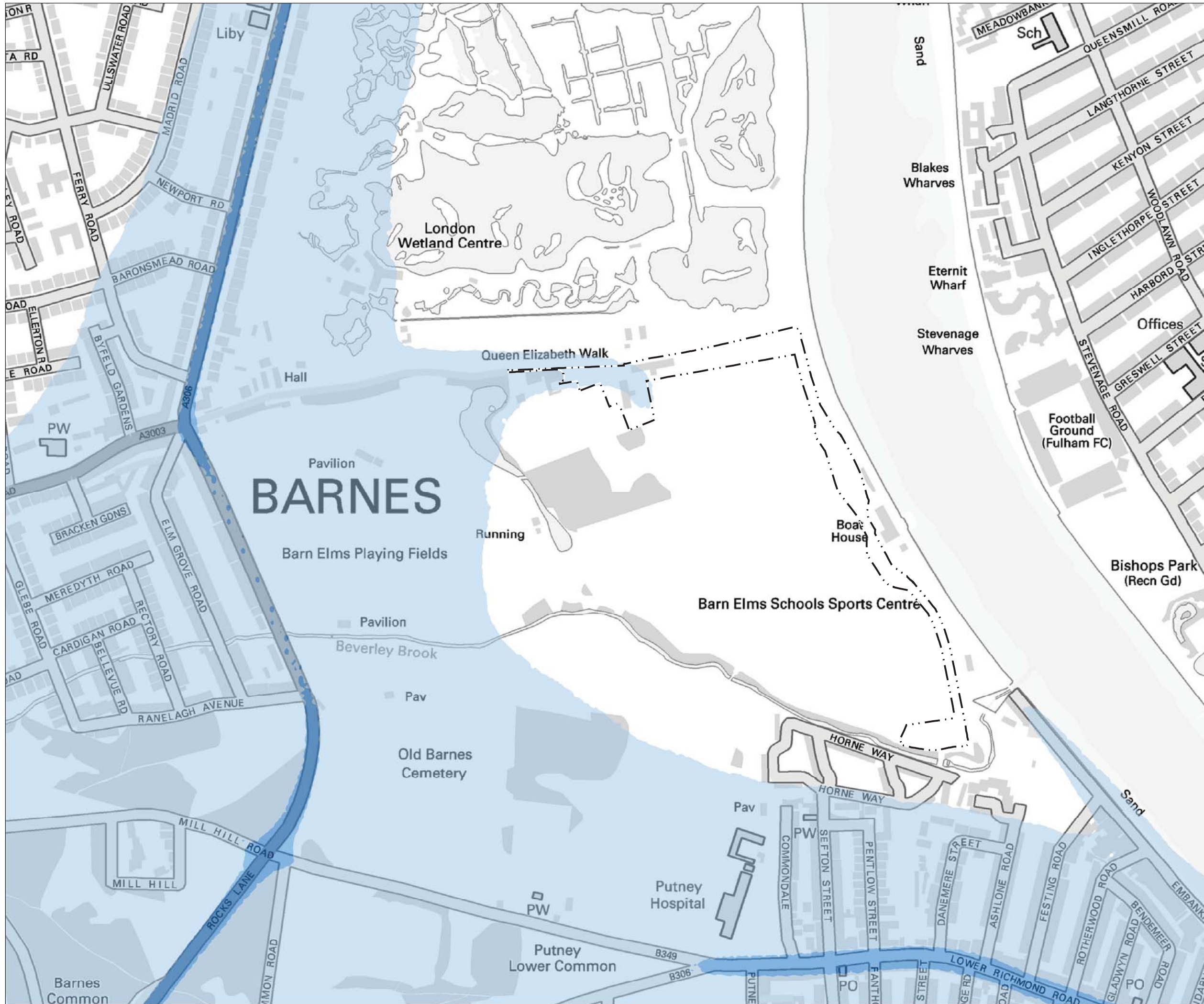


FOR INFORMATION

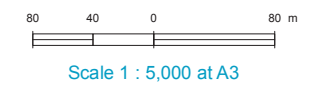
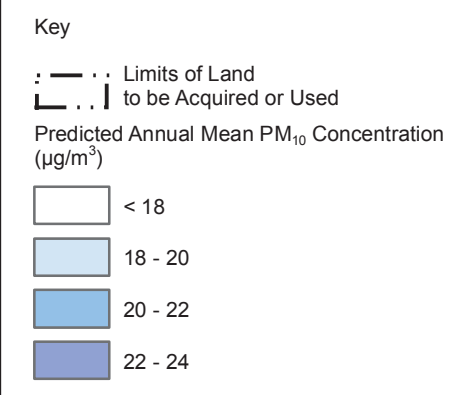
Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - annual mean PM₁₀ for 2010 baseline
 Vol.6 Figure 4.5.5
 1PL03-AQ-10790
 January 2013





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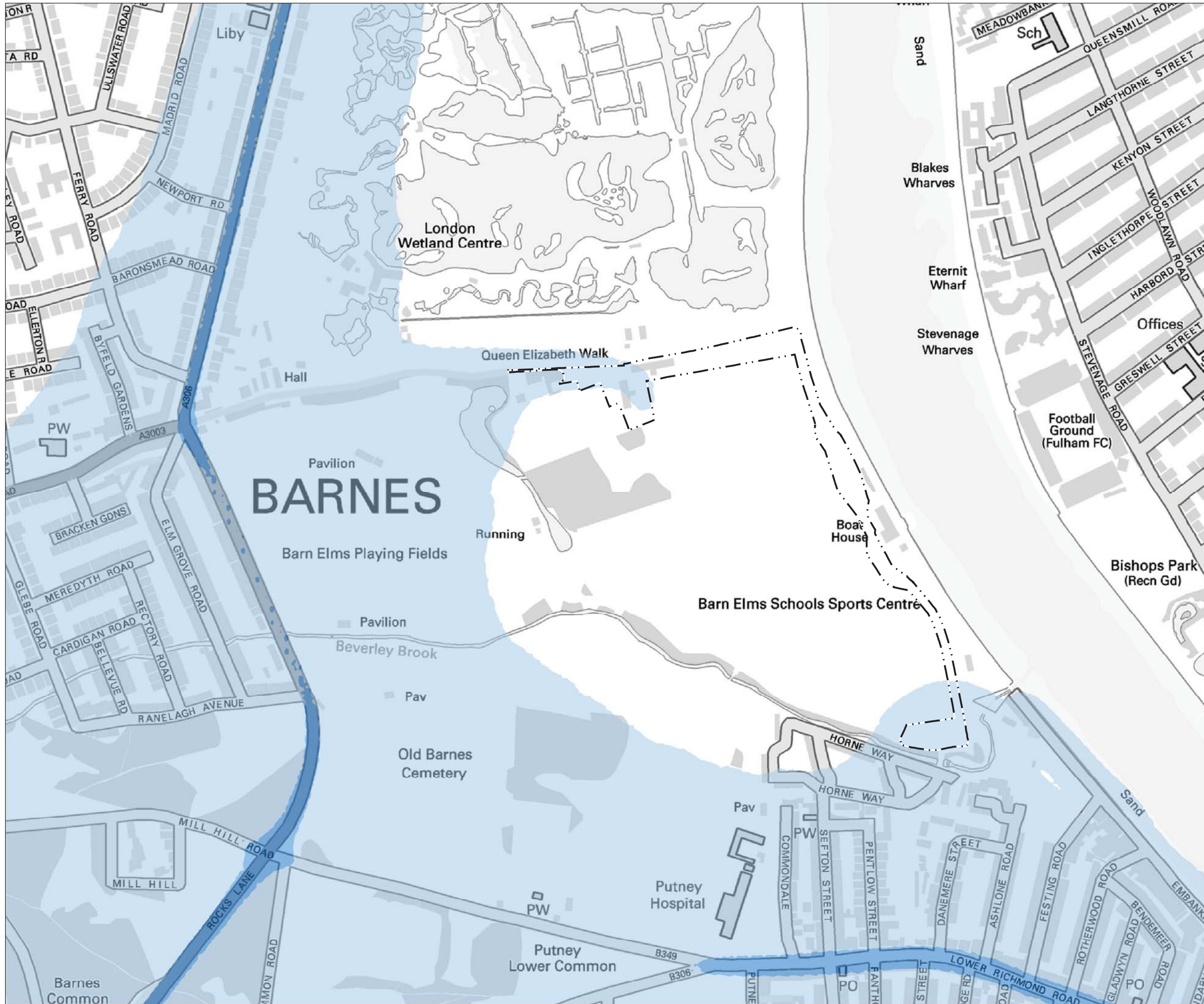


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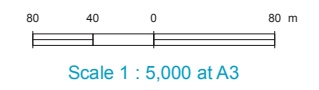
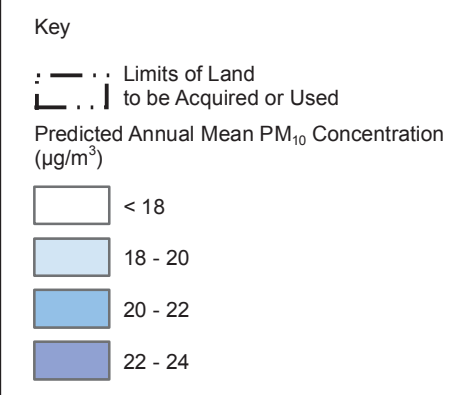
Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - annual mean PM₁₀ for peak construction year base case
 Vol.6 Figure 4.5.6
 1PL03-AQ-10791
 January 2013





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FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Air quality and odour - annual mean PM₁₀ for peak construction year development case Vol.6 Figure 4.5.7
 1PL03-AQ-10792
 January 2013

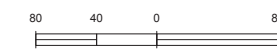


Keyplan:



Key

- Limits of Land
 - - - to be Acquired or Used
- Predicted Annual Mean PM₁₀ Impact (µg/m³)
- < 0.4
 - 0.4 - 0.6
 - 0.6 - 0.8
 - 0.8 - 1
 - 1 - 1.2



Scale 1 : 5,000 at A3

FOR INFORMATION

Location

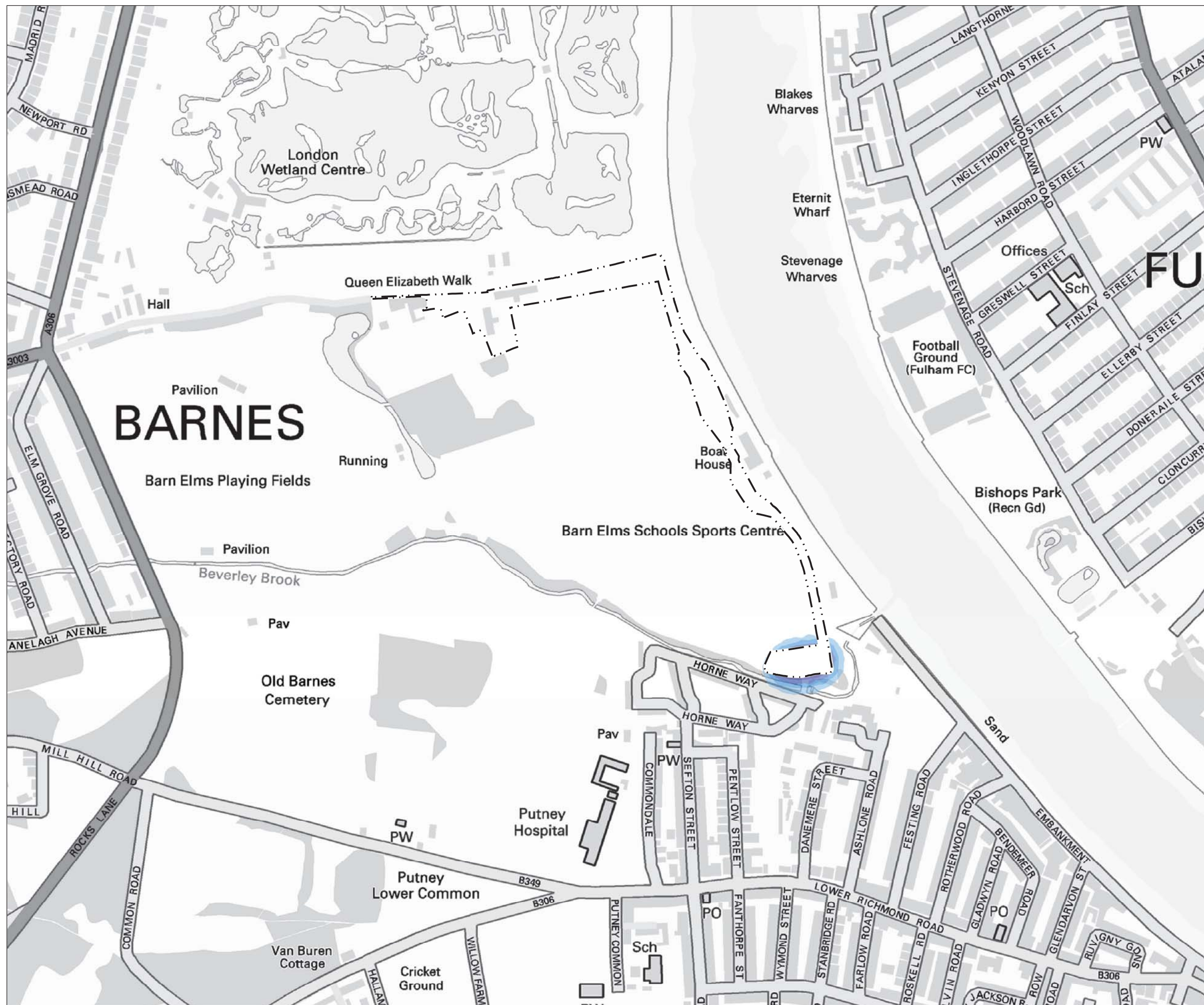
Barn Elms
London Borough of Richmond upon Thames

Document Information

Environmental Statement

Air quality and odour - annual mean PM₁₀ impact for peak construction year
Vol.6 Figure 4.5.8

1PL03-AQ-10793
January 2013

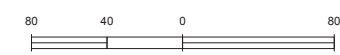


Keyplan:



Key

- Limits of Land to be Acquired or Used
- Sampling Area for Fish and Benthic Invertebrates
- Coordinates of Sampling Area
- CSO (Directly Controlled)
- River Wall
- Habitats**
- Pebbles Dominant, with Shingle, Sand, Cobbles and Silt
- Vegetation
- Fish**
- Boat Fish Trawl
- Seine Netting
- Invertebrates**
- Airlift
- Quadrat
- ▲ Sweep/Kick Sample



Scale 1 : 4,000 at A3

FOR INFORMATION

[Location](#)

Barn Elms
London Borough of Richmond upon Thames

[Document Information](#)

Environmental Statement

Aquatic ecology - habitats and sampling locations
Vol.6 Figure 5.4.1

1PL03-AE-20082

January 2013

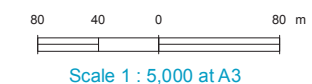


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- Key**
- Limits of Land to be Acquired or Used
 - 250m from Site
 - Local Authority Boundary
- Sites of Importance for Nature Conservation (SINC)**
- Metropolitan Importance
 - Borough Importance
 - Local Nature Reserves
 - Site of Special Scientific Interest

Note:
Aerial Imagery taken in 2010, before assessment.



FOR INFORMATION

Location
Barn Elms
London Borough of Richmond upon Thames

Document Information
Environmental Statement
Terrestrial ecology - designated sites

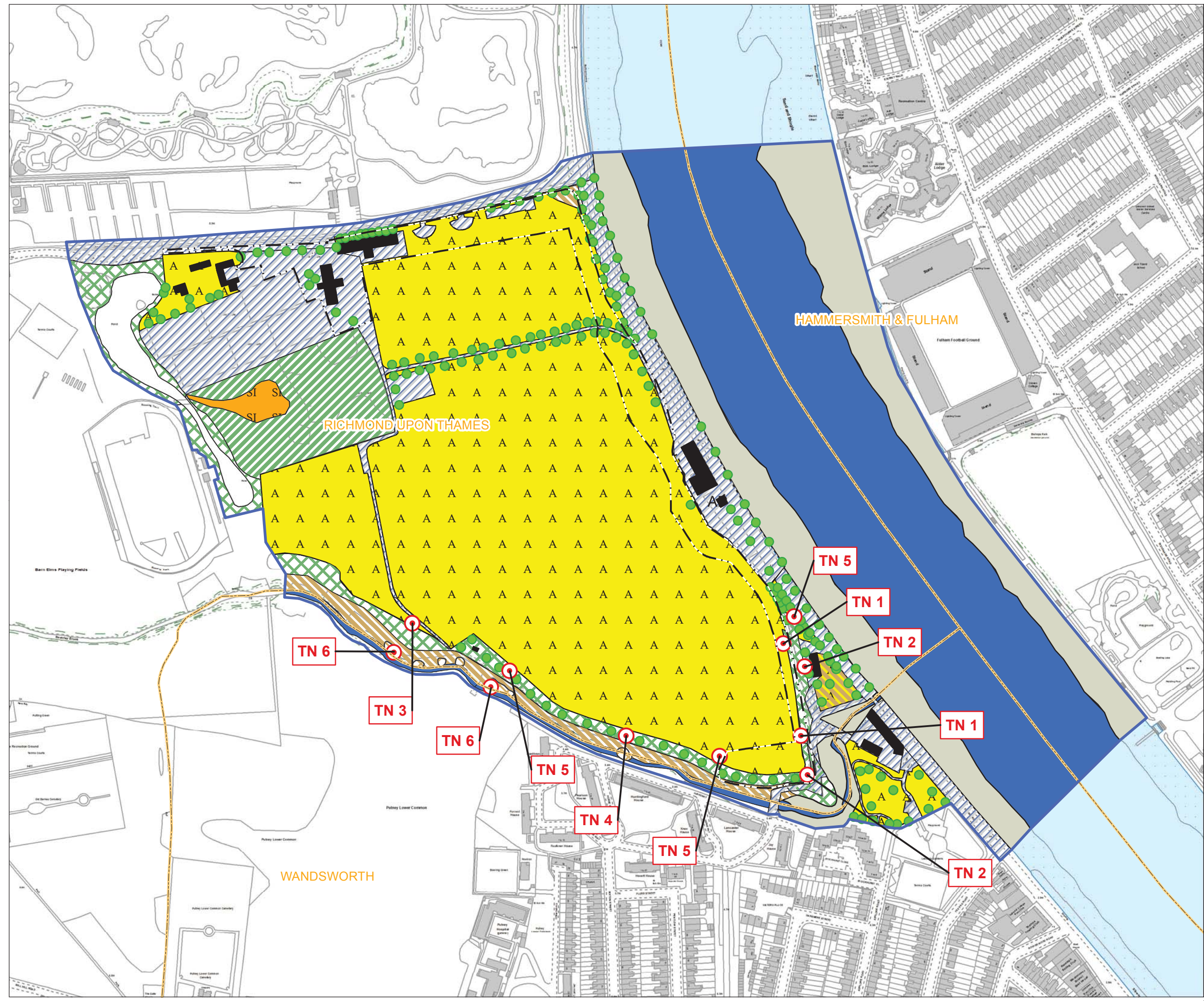
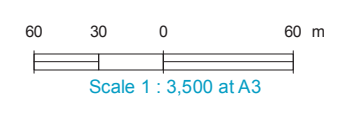
Vol. 6 Figure 6.4.1
1PL03-TE-40137
January 2013



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- Key**
- Limits of Land to be Acquired or Used
 - Survey Area
 - Local Authority Boundary
 - A Cultivated/Disturbed Land - Amenity Grassland
 - Introducing Shrub Cultivated/Disturbed Land - Introduced Shrub
 - SI Neutral Grassland - Semi-Improved
 - Built-Up Areas - Buildings
 - ▨ Hard Standing
 - Intertidal - Mud/Sand
 - ▨ Other - Tall Ruderal
 - Running Water
 - ▨ Scrub - Dense/Continuous
 - ▨ Woodland - Broad-Leaved - Plantation
 - ⊙ Target Note
 - Scattered Trees



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Terrestrial ecology – Phase 1 Habitat Survey

Vol. 6 Figure 6.4.2
 1PL03-TE-40139
 January 2013



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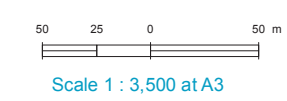
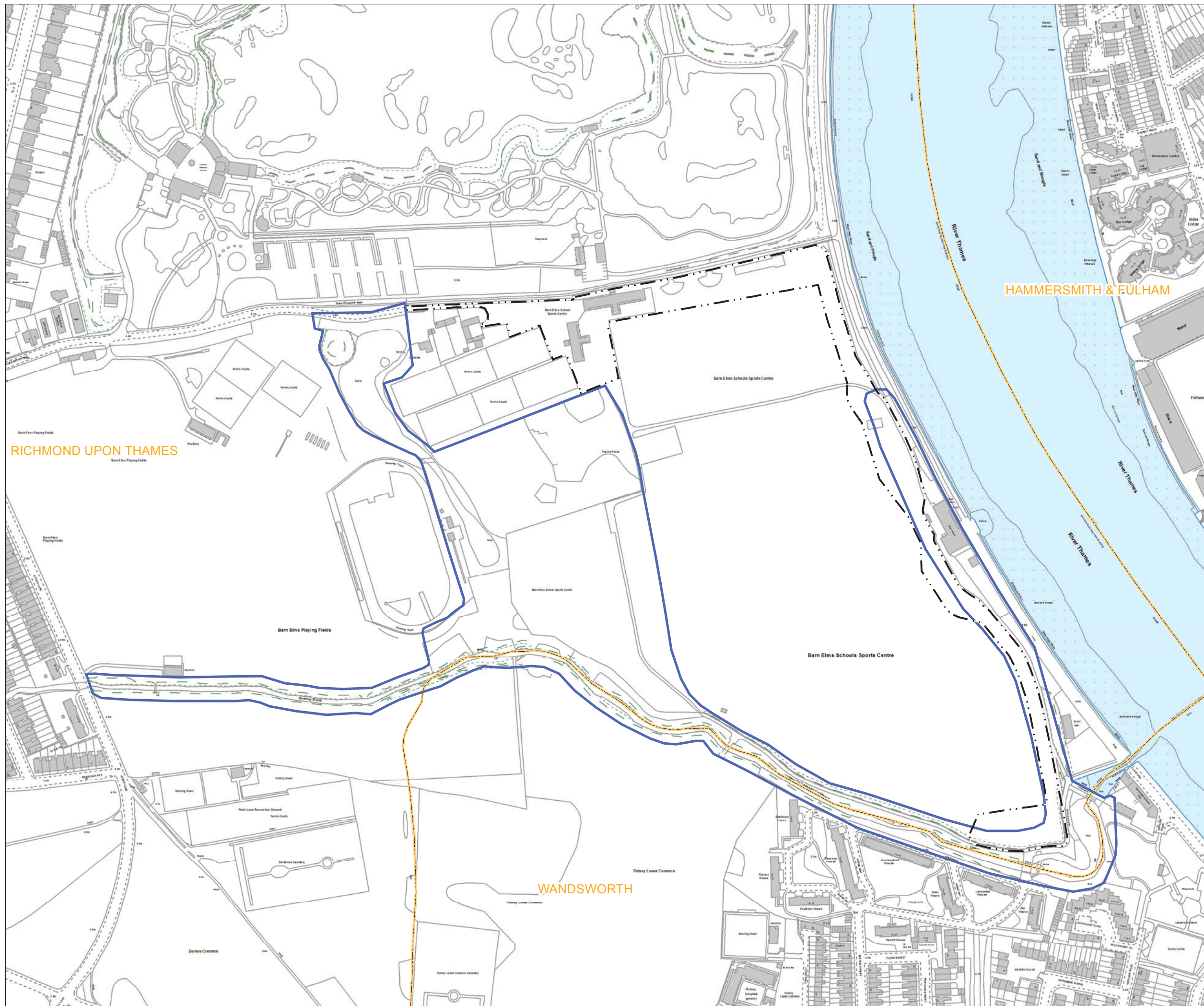
Keyplan:



Key

- Limits of Land
- - - to be Acquired or Used
- ▭ Survey Area
- ▭ Local Authority Boundary

Note:
No field signs recorded during survey.



FOR INFORMATION

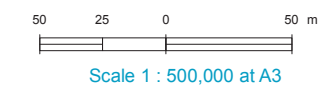
Location
Barn Elms
London Borough of Richmond Upon Thames

Document Information
Environmental Statement
Terrestrial ecology – otter and water vole survey
Vol. 6 Figure 6.4.3
1PL03-TE-40082
January 2013





- Key**
- Limits of Land to be Acquired or Used
 - ▭ Survey Area
 - ▭ Local Authority Boundary
 - Paths
 - Latrine
 - Foraging scrape

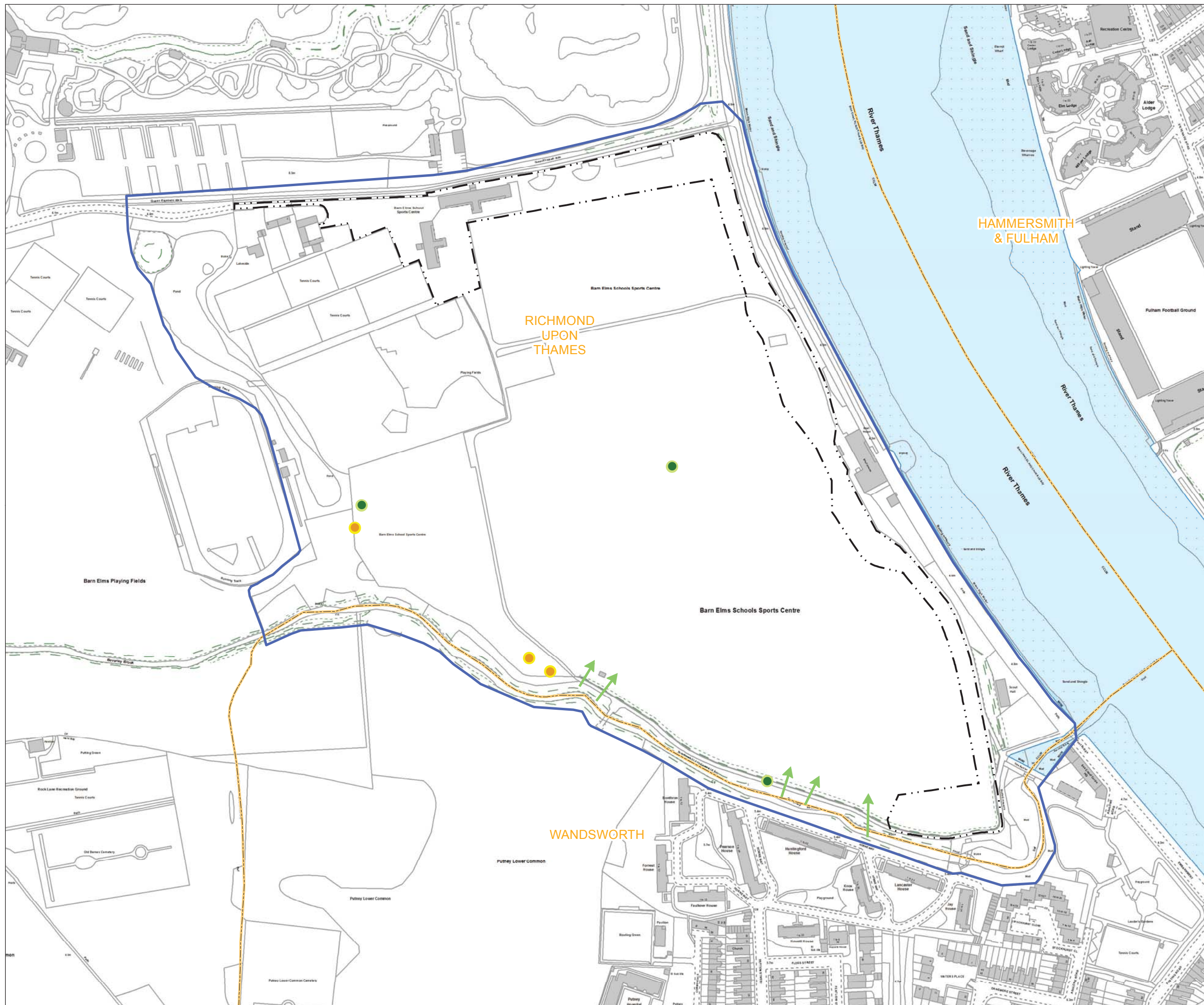


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Terrestrial ecology – badger survey

Vol. 6 Figure 6.4.4
 1PL03-TE-40080
 January 2013





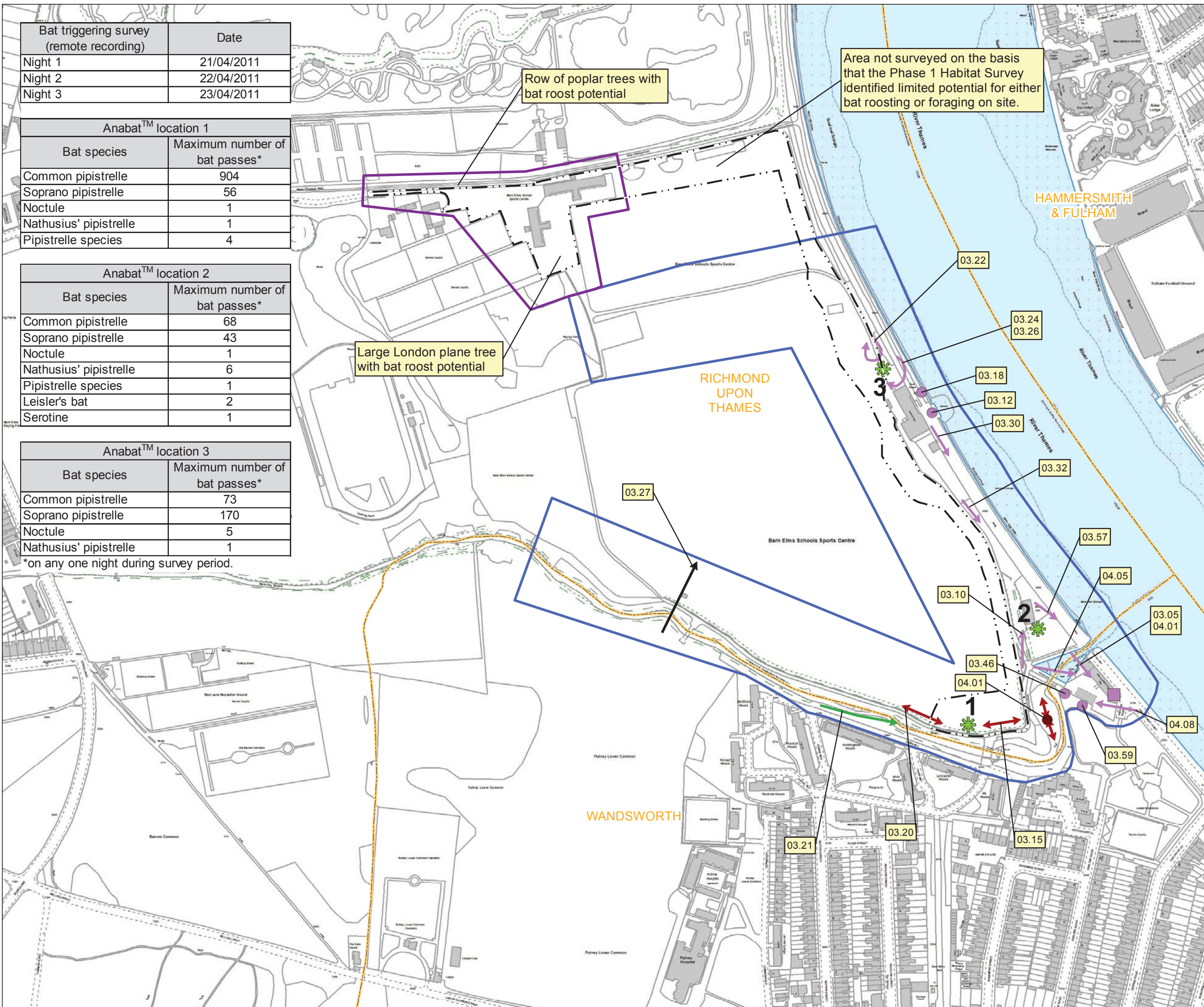
Bat triggering survey (remote recording)	Date
Night 1	21/04/2011
Night 2	22/04/2011
Night 3	23/04/2011

Anabat™ location 1	
Bat species	Maximum number of bat passes*
Common pipistrelle	904
Soprano pipistrelle	56
Noctule	1
Nathusius' pipistrelle	1
Pipistrelle species	4

Anabat™ location 2	
Bat species	Maximum number of bat passes*
Common pipistrelle	68
Soprano pipistrelle	43
Noctule	1
Nathusius' pipistrelle	6
Pipistrelle species	1
Leisler's bat	2
Serotine	1

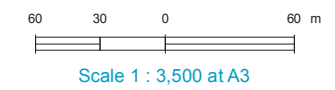
Anabat™ location 3	
Bat species	Maximum number of bat passes*
Common pipistrelle	73
Soprano pipistrelle	170
Noctule	5
Nathusius' pipistrelle	1

*on any one night during survey period.



- Key**
- Limits of Land
 - - - to be Acquired or Used
 - Survey Area of Bat Activity Survey
 - Survey Area for Additional Bat Roost Potential Survey
 - Local Authority Boundary

- Bat Triggering Survey (Remote Recording)**
- Anabat™ Location (1-3)
- Activity Survey (Dawn at 04:45 on 07/06/2012)**
- hh.mm Time of Bat Registration
- Record (Registration Only, Bat Not Observed)**
- Common Pipistrelle
 - Soprano Pipistrelle
 - Soprano Pipistrelle - Roost
- Flight Paths (Observed)**
- Common Pipistrelle
 - Myotis Sp.
 - Noctule
 - Soprano Pipistrelle
- Foraging (Observed)**
- Soprano Pipistrelle



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Terrestrial ecology – bat triggering (remote recording) and bat activity survey
 Vol. 6 Figure 6.4.5
 1PL03-TE-40079
 January 2013



Breeding Territories - Bird Codes

Species of conservation concern (red list):

ST - Song thrush

Species of conservation concern (amber list):

D. - Dunnock

MA - Mallard

SD - Stock dove

Species of conservation concern (green list):

B. - Blackbird

BC - Blackcap

BT - Blue tit

C. - Carrion crow

GC - Goldcrest

GR - Greenfinch

MH - Moorhen

R. - Robin

WP - Wood pigeon

WR - Wren

Keyplan:



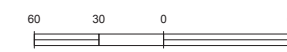
Key

- Limits of Land
- to be Acquired or Used
- Local Authority Boundary
- Survey Area

Breeding Territories

Species of Conservation Concern

- Red List
- Amber List
- Green List



Scale 1 : 3,500 at A3

FOR INFORMATION

Location

Barn Elms
London Borough of Richmond upon Thames

Document Information

Environmental Statement

Terrestrial ecology - breeding bird survey

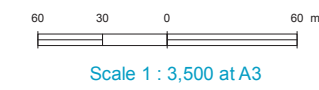
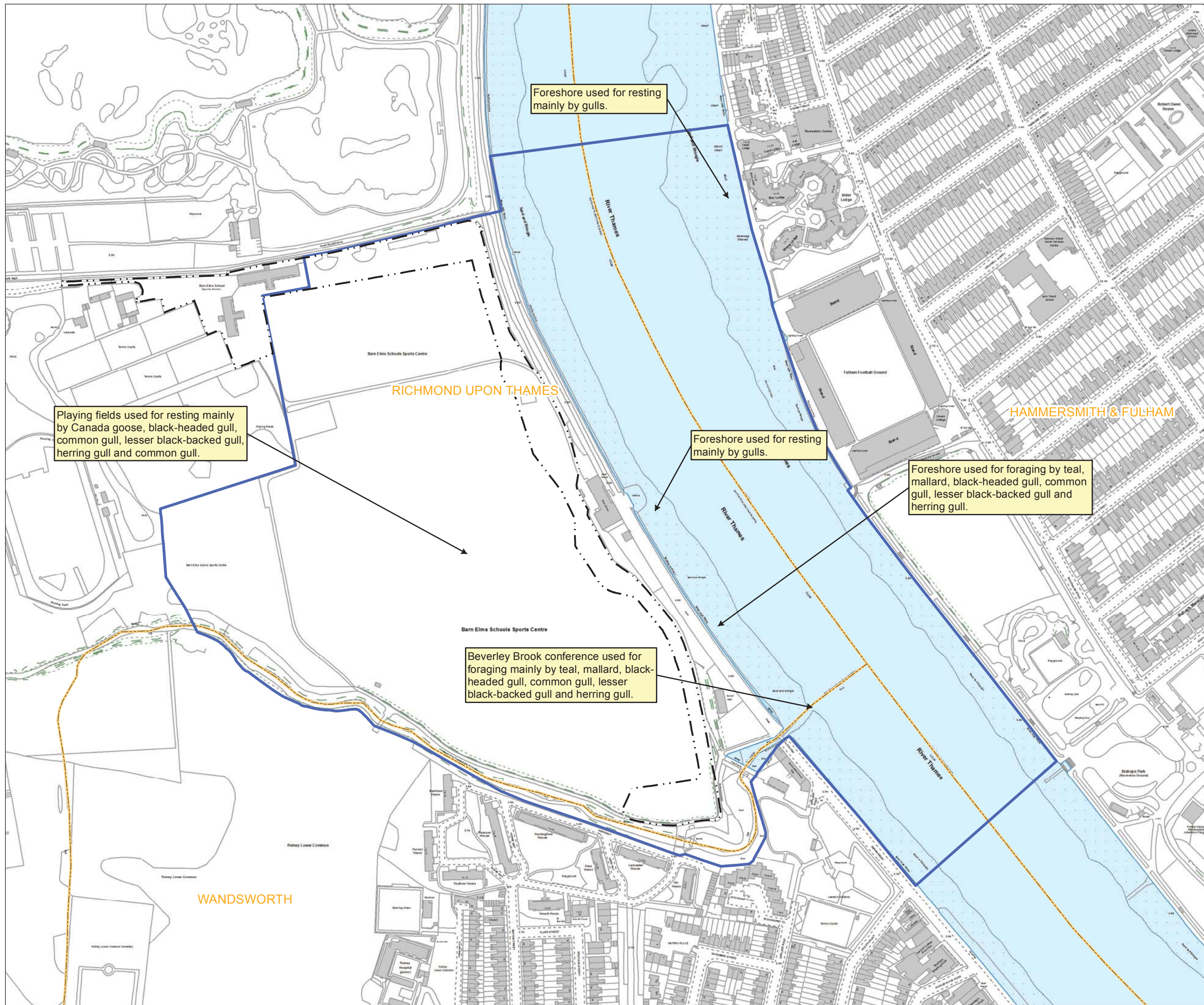
Vol. 6 Figure 6.4.6

1PL03-TE-40044

January 2013



- Key
- Limits of Land
 - to be Acquired or Used
 - Survey Area
 - Local Authority Boundary



Scale 1 : 3,500 at A3

FOR INFORMATION

Location
Barn Elms
London Borough of Richmond upon Thames

Document Information
Environmental Statement
Terrestrial ecology – wintering birds survey

Vol.6 Figure 6.4.7
1PL03-TE-40063
January 2013



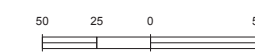
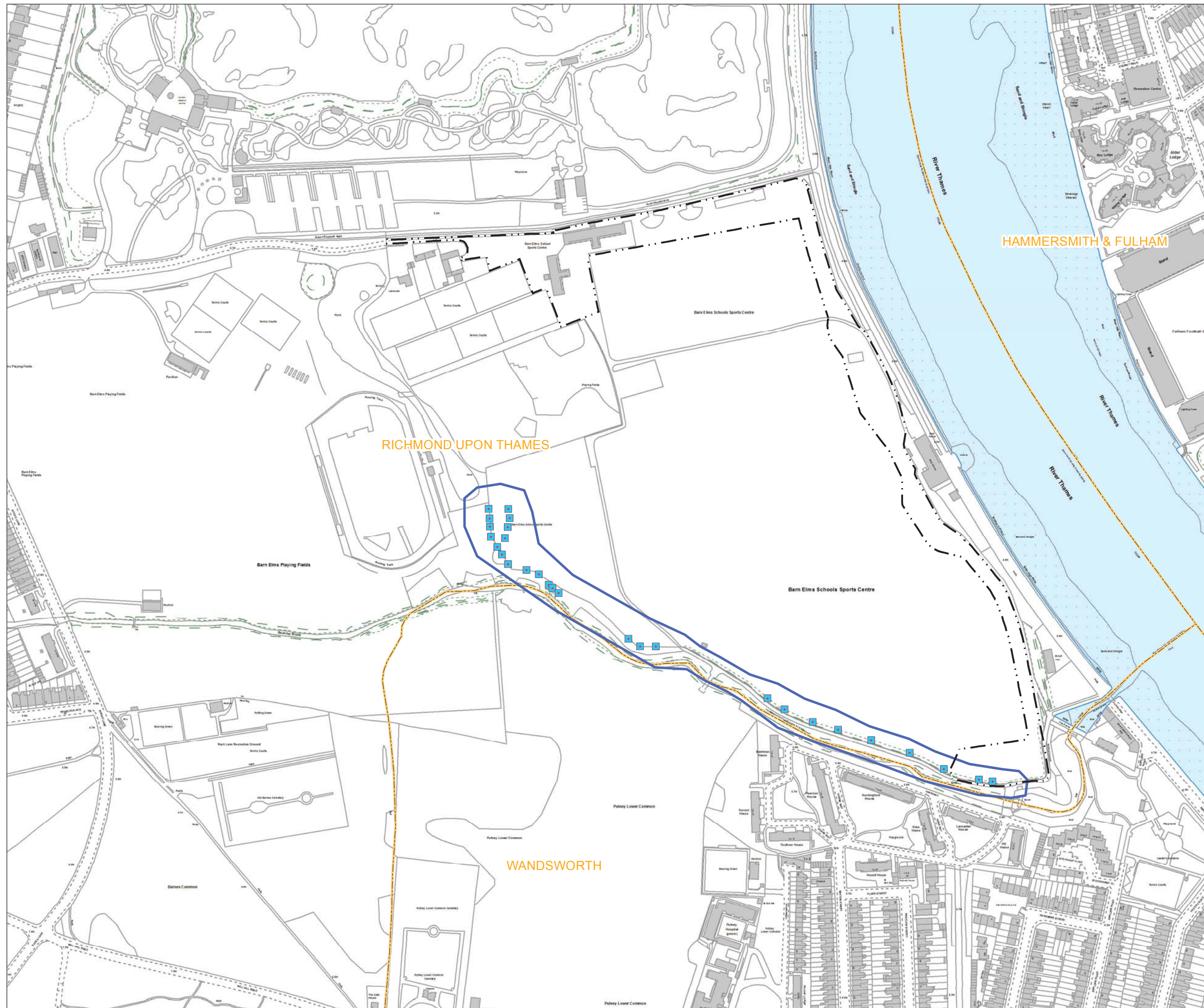
Keyplan:



Key

- Limits of Land to be Acquired or Used
- ▭ Survey Area
- ▭ Local Authority Boundary
- Reptile Mat

Note:
No reptiles recorded during survey.



Scale 1 : 3,500 at A3

FOR INFORMATION

Location

Barn Elms
London Borough of Richmond upon Thames

Document Information

Environmental Statement

Terrestrial ecology – reptile survey

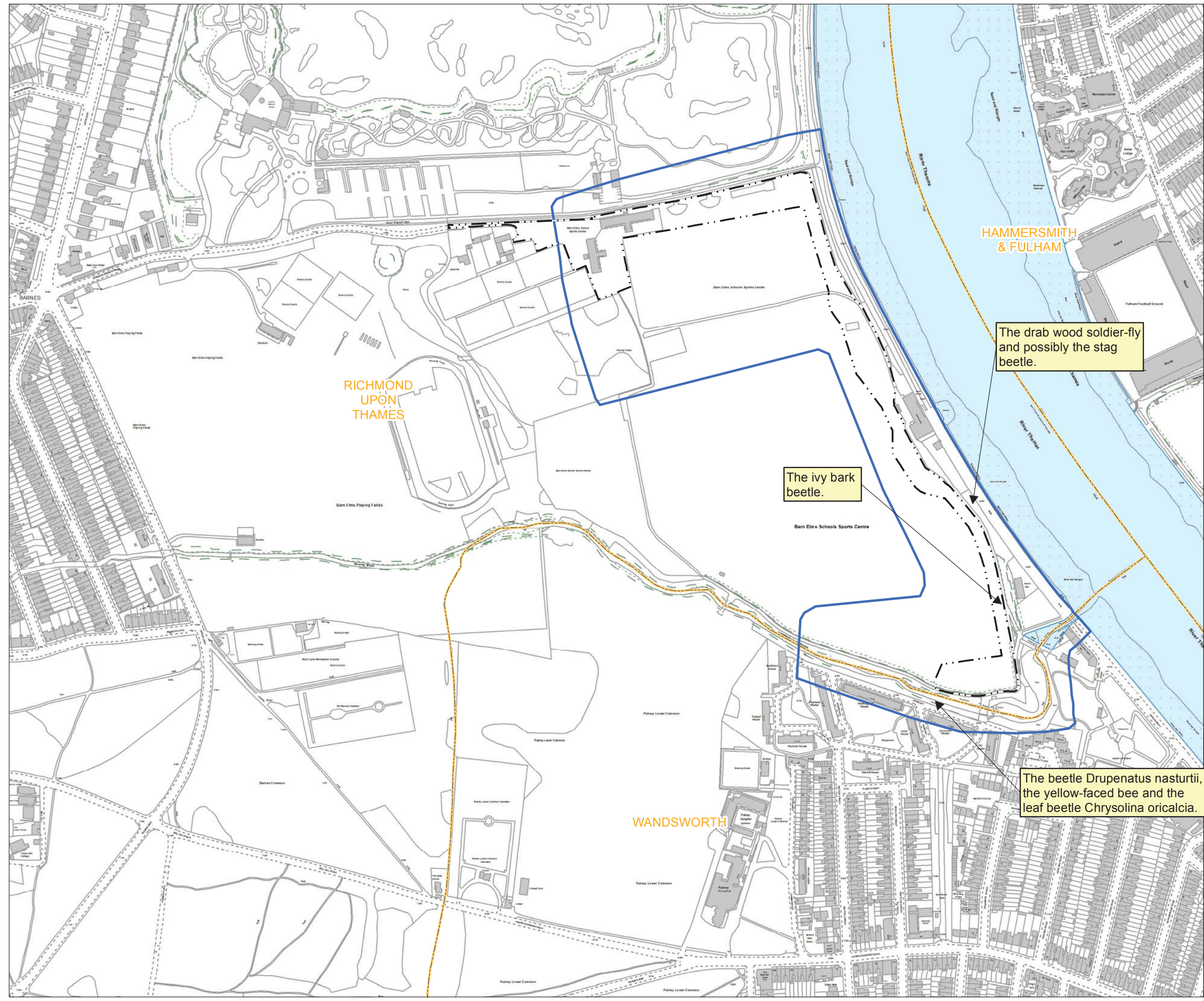
Vol. 6 Figure 6.4.8

1PL03-TE-40081

January 2013



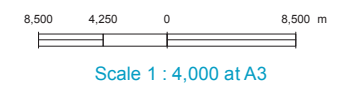
- Key**
- Limits of Land to be Acquired or Used
 - Survey Area
 - Local Authority Boundary



The drab wood soldier-fly and possibly the stag beetle.

The ivy bark beetle.

The beetle *Drupenatus nasturtii*, the yellow-faced bee and the leaf beetle *Chrysolina oricalcia*.



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Terrestrial ecology – invertebrate survey

Vol. 6 Figure 6.4.9
 1PL03-TE-40048
 January 2013

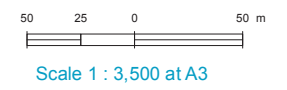


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- Key**
- Limits of Land to be Acquired or Used
 - Survey Area
 - Local Authority Boundary

Note:
No species recorded during survey.

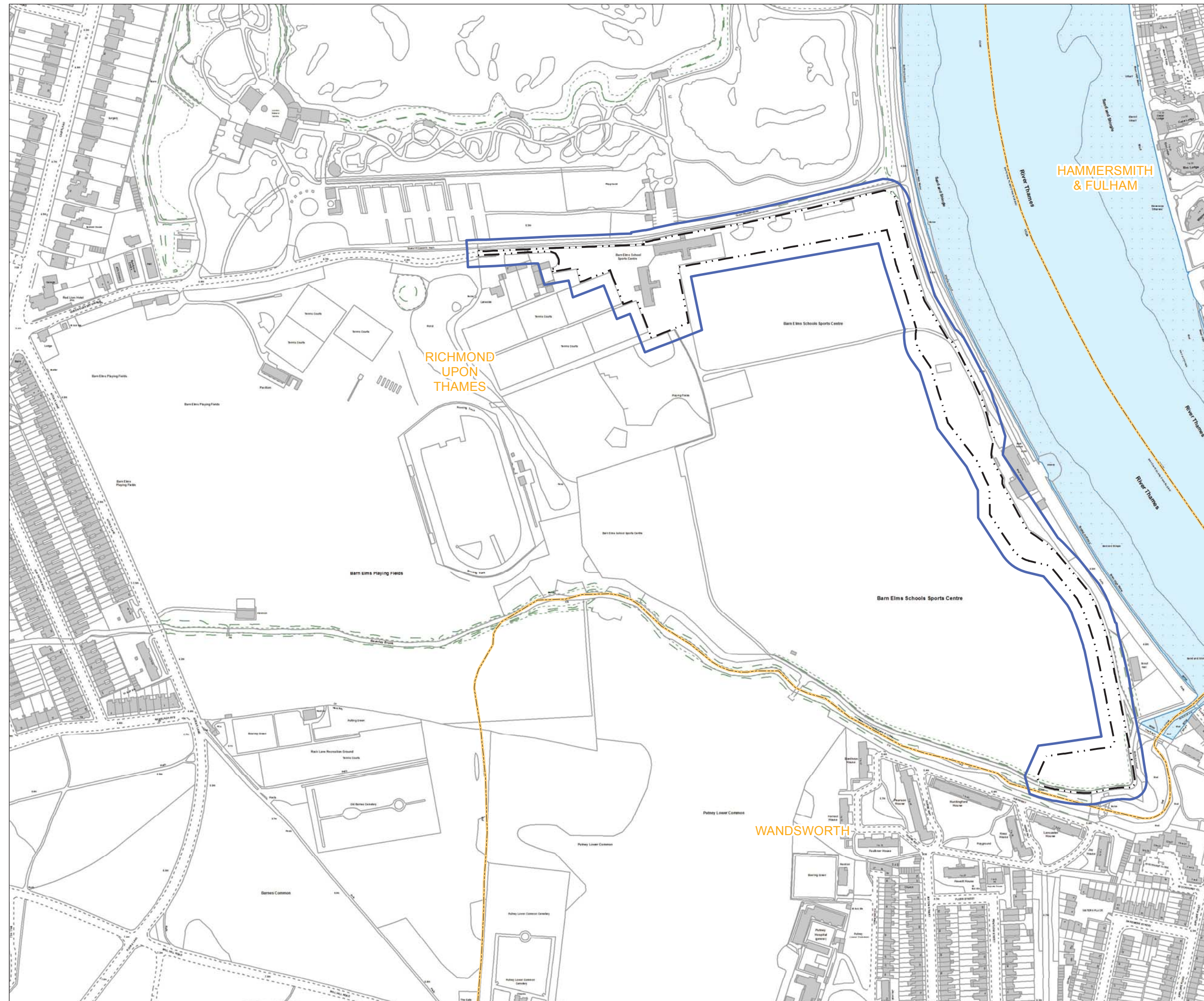


FOR INFORMATION

Location
Barn Elms
London Borough of Richmond upon Thames

Document Information
Environmental Statement
Terrestrial Ecology - invasive plant survey

Vol. 6 Figure 6.4.10
1PL03-TE-40046
January 2013



Keyplan:

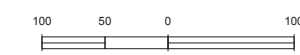


Key

- Limits of Land to be Acquired or Used
- Assessment Area
- Heritage Feature/Findspot
- Past Archaeological Investigation
- Statutorily Listed Building
- Wreck/Obstruction
- Registered Park/Garden

The reference numbers for historic environment features correspond to the descriptions in the 'Gazetteer of known heritage assets' in Environmental Statement Vol. 6 Appendix E.1

Note: Archaeological Priority Zones/Conservation Areas not shown



Scale 1 : 6,000 at A3

FOR INFORMATION

Location

Barn Elms
London Borough of Richmond upon Thames

Document Information

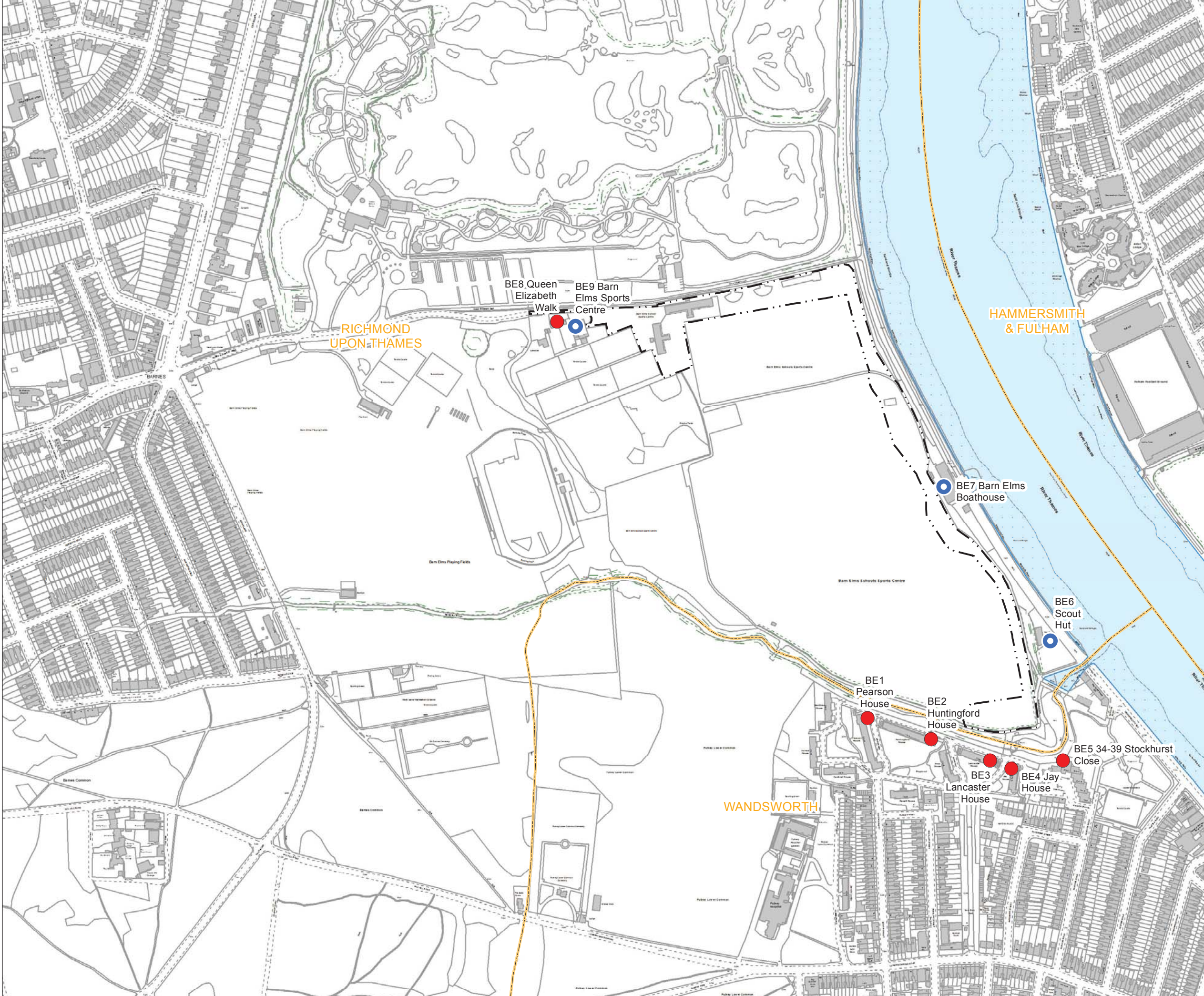
Environmental Statement

Historic environment -
historic environment features map
Vol.6 Figure 7.4.1

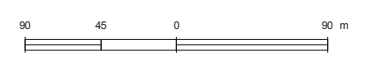
1PL03-HE-60079
January 2013



- Key
- Limits of Land to be Acquired or Used
 - Local Authority Boundary
- Representative Receptor Locations:
- Residential
 - Non-residential



Note:
The receptors are selected on the basis that they are representative of sensitive land uses closest to the site.



Scale 1 : 4,500 at A3

FOR INFORMATION

Location
Barn Elms
London Borough of Richmond upon Thames

Document Information
Environmental Statement
Noise and vibration - receptor locations

Vol.6 Figure 9.4.1
1PL03-NV-40120
January 2013

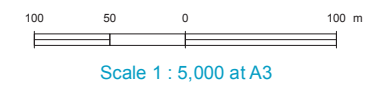
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- Key**
- Limits of Land to be Acquired or Used
 - Barn Elms Schools Sports Centre, London Borough of Wandsworth
 - Barn Elms Playing Fields, London Borough of Richmond upon Thames
 - Beverley Brook Public Footpath
 - Queen Elizabeth Walk
 - Thames Path
 - National Cycle Route 4
 - Receptors and Site Context Features

- Receptors and Site Context Features**
1. London Wetland Centre
 2. Sea Cadet Corps HQ
 3. Leaders Gardens
 4. Scout Hut
 5. Putney Lower Common
 6. Barn Elms Boat House

Note: Residential receptors have been identified on land use plans for this site.

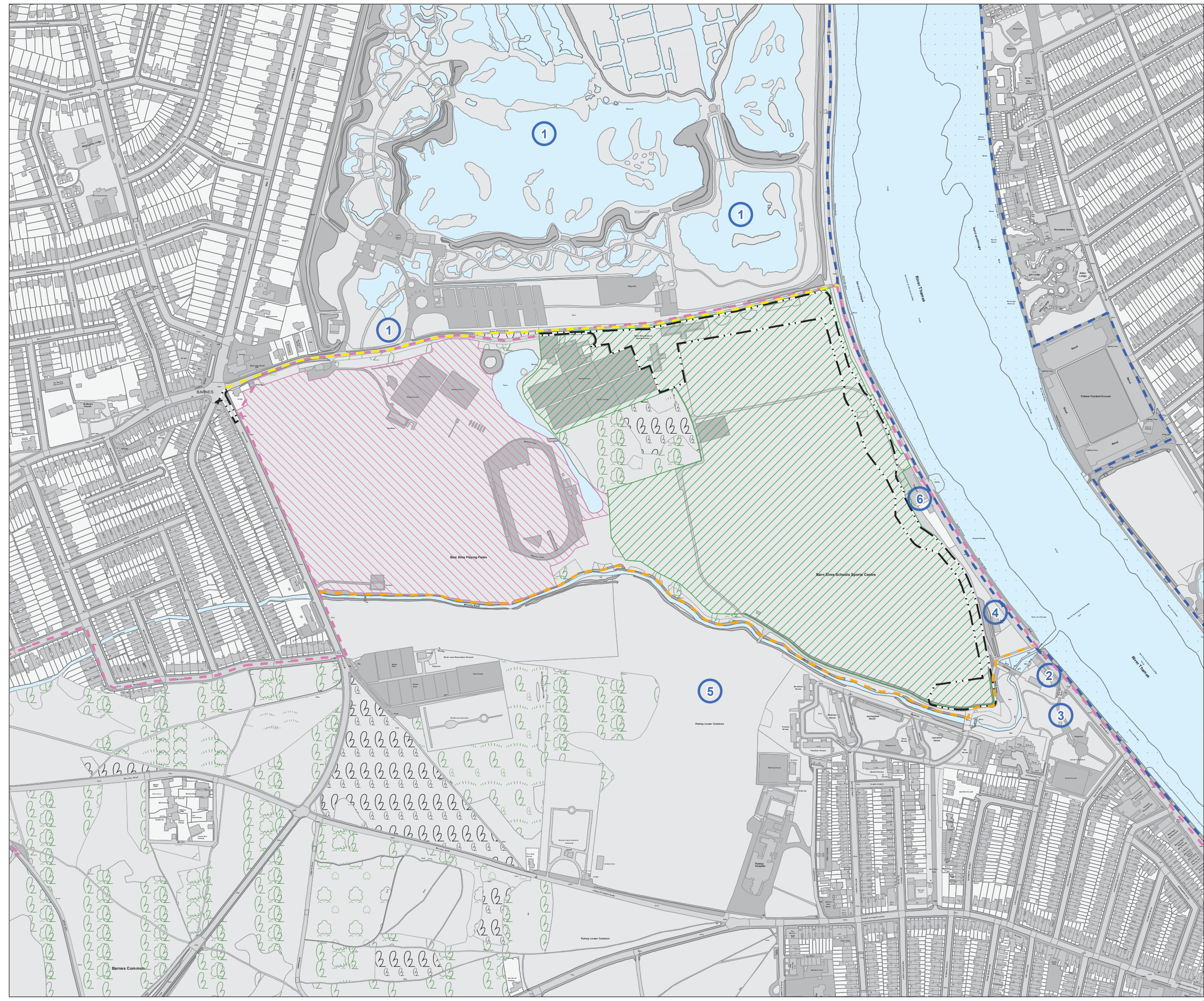


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

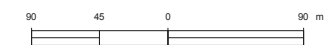
Document Information
Environmental Statement
 Socio-economics - context plan

Vol.6 Figure 10.4.1
 1PL03-SE-20060
 January 2013

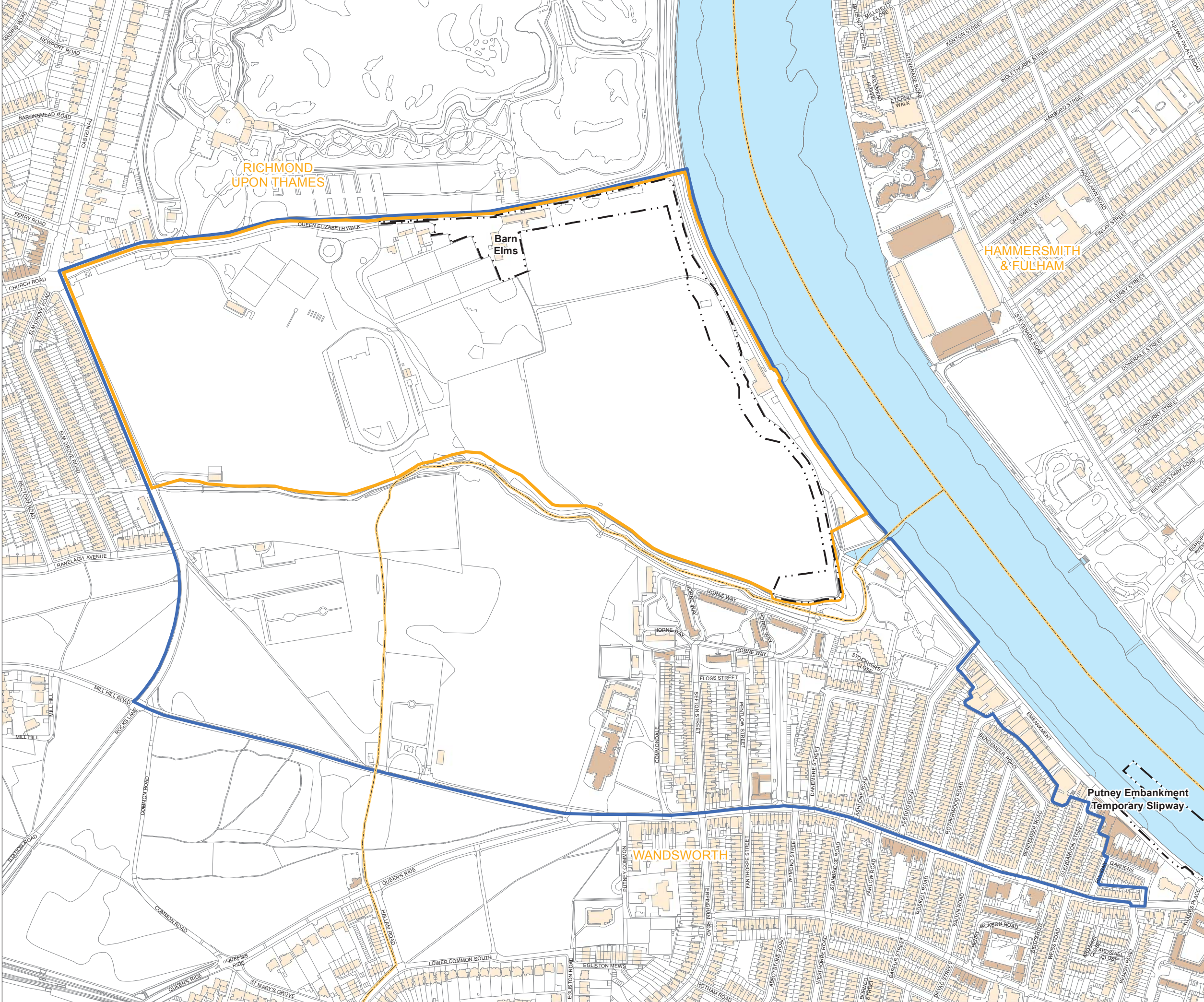




- Key:**
- Limits of Land to be Acquired or Used
 - - - Local Authority boundary
 - ▭ Extents of construction phase townscape assessment area
 - ▭ Extents of operational phase townscape assessment area
 - ▭ River Thames and tidal tributaries
- Building heights**
- 0 - 20m
 - 20 - 40m
 - 40 - 60m
 - 60 - 80m
 - 80 - 100m
 - >100m



Scale 1 : 5,000 at A3



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Townscape and visual
 Development pattern and scale
 Vol. 6 Figure 11.4.1
 1PL03-TS-40359
 January 2013

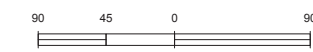


Keyplan:



Key:

- Limits of Land to be Acquired or Used
- Local Authority boundary
- Extents of construction phase townscape assessment area
- Extents of operational phase townscape assessment area



Scale 1 : 5,000 at A3

FOR INFORMATION

Location

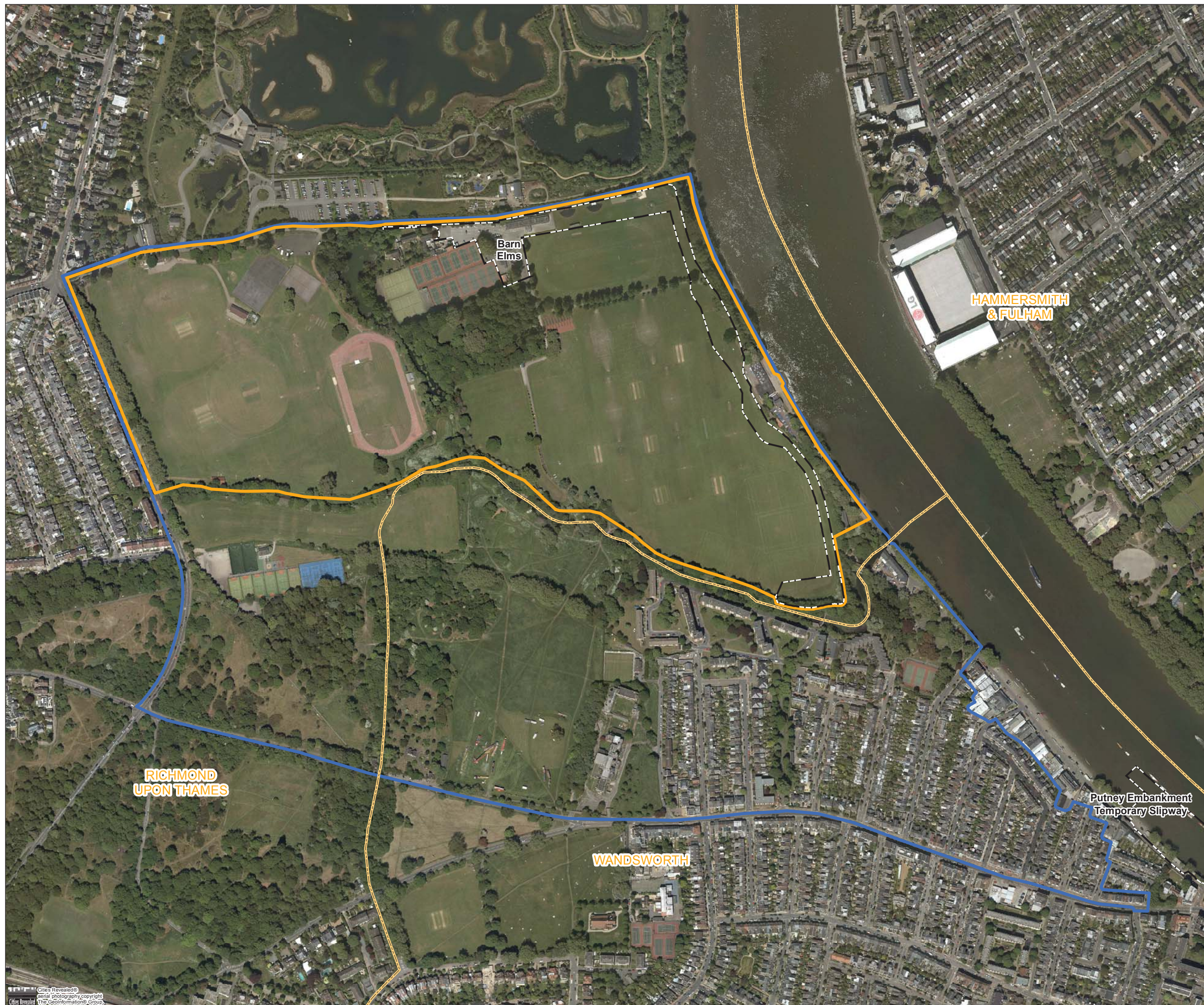
Barn Elms
London Borough of Richmond upon Thames

Document Information

Environmental Statement

Townscape and visual
Aerial photo showing pattern of vegetation
Vol. 6 Figure 11.4.2

1PL03-TS-40360
January 2013





- Key:**
- Limits of Land
 - to be Acquired or Used
 - Local Authority boundary
 - Extents of construction phase townscape assessment area
 - Extents of operational phase townscape assessment area
 - Metropolitan Open Land
 - Public open space
 - River Thames and tidal tributaries

90 45 0 90 m

Scale 1 : 5,000 at A3

FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement

Townscape and visual
 Open spaces
 Vol. 6 Figure 11.4.3
 1PL03-TS-40361
 January 2013

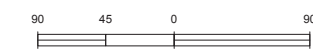


Keyplan:



Key:

- Limits of Land to be Acquired or Used
- Local Authority boundary
- Extents of construction phase townscape assessment area
- Extents of operational phase townscape assessment area
- National Rail stations
- Thames Path
- Provision for cyclists alongside busy roads
- London cycle routes
- Rail
- A roads
- River Thames and tidal tributaries



Scale 1 : 5,000 at A3

FOR INFORMATION

Location

Barn Elms
London Borough of Richmond upon Thames

Document Information

Environmental Statement

Townscape and visual

Transport routes

Vol. 6 Figure 11.4.4

1PL03-TS-40362

January 2013





- Key:**
- Limits of Land
 - to be Acquired or Used
 - Local Authority boundary
 - Extents of construction phase townscape assessment area
 - Extents of operational phase townscape assessment area
 - Conservation areas

The colour fills shown on the plan are used to differentiate between townscape character areas



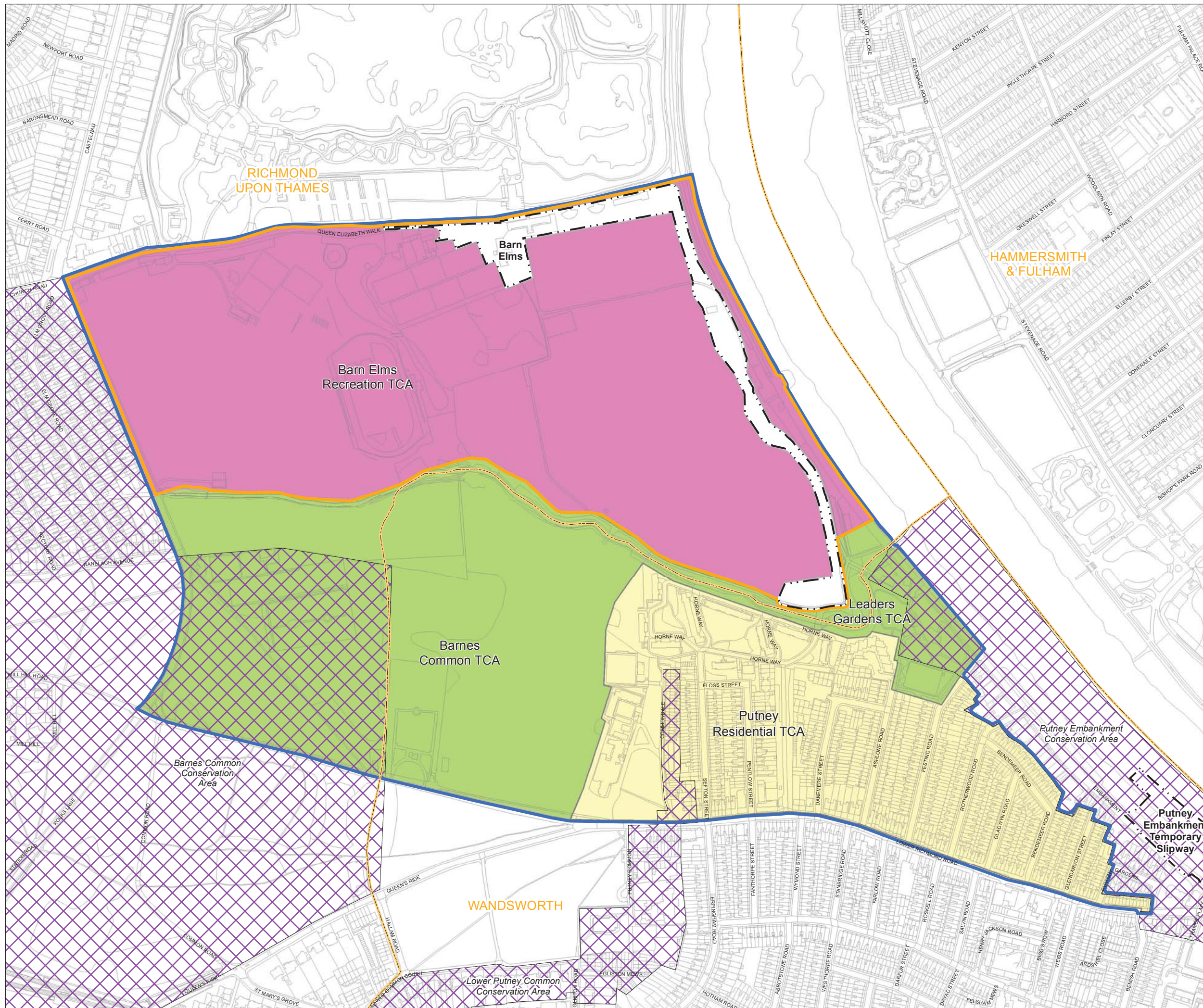
Scale 1 : 5,000 at A3

FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement

Townscape and visual
 Townscape character areas
 Vol. 6 Figure 11.4.5
 1PL03-TS-40363
 January 2013

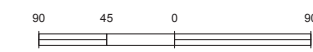


Keyplan:



Key:
The zone of theoretical visibility (ZTV) is a computer generated model which indicates the theoretical visibility of the construction works (including cranes) and operational structures. As described in Volume 2 the ZTV is a starting point for defining the assessment area and for informing the assessment of likely significant effects. Theoretical visibility does not necessarily mean a location would be subject to adverse effects.

- Limits of Land
- to be Acquired or Used
- Local Authority boundary
- Visual assessment points
- Construction phase ZTV
- Operational phase ZTV
- River Thames and tidal tributaries



Scale 1 : 5,000 at A3

FOR INFORMATION

Location
Barn Elms
London Borough of Richmond upon Thames

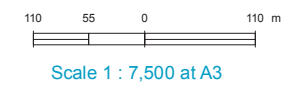
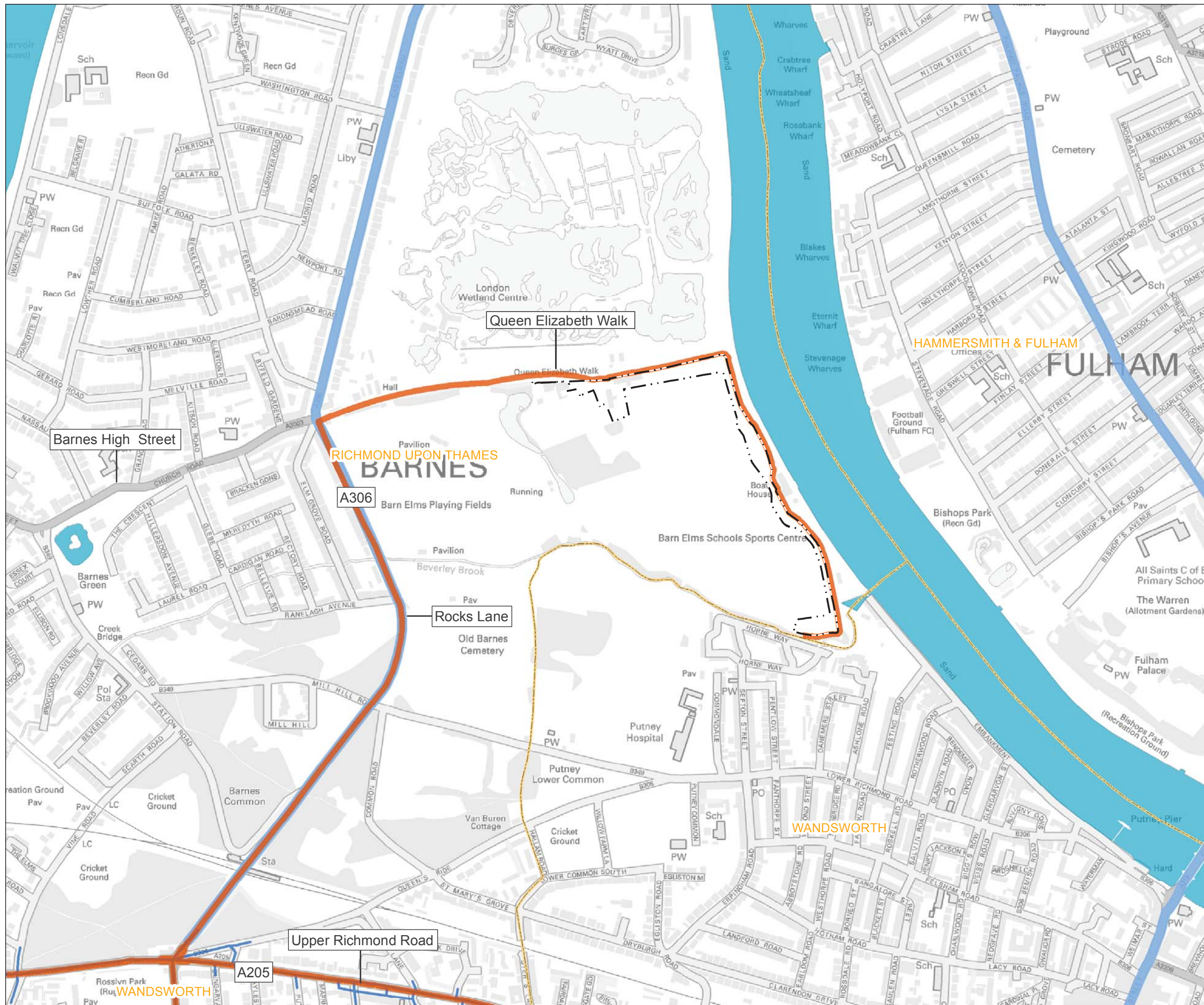
Document Information
Environmental Statement

Townscape and visual Viewpoints
Vol. 6 Figure 11.4.6
1PL03-TS-40364
January 2013





- Key**
- TFL road network
 - Strategic road network
 - Primary construction route
 - Limits of Land to be Acquired or Used
 - Local authority boundary



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond

Document Information
Environmental Statement
 Transport - construction traffic routes

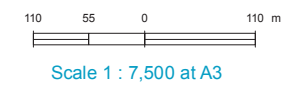
Vol.6 Figure 12.2.1
 1PL03-TT-50499
 January 2013



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- Key**
- TFL road network
 - Strategic road network
 - Limits of Land to be Acquired or Used
 - Local authority boundary

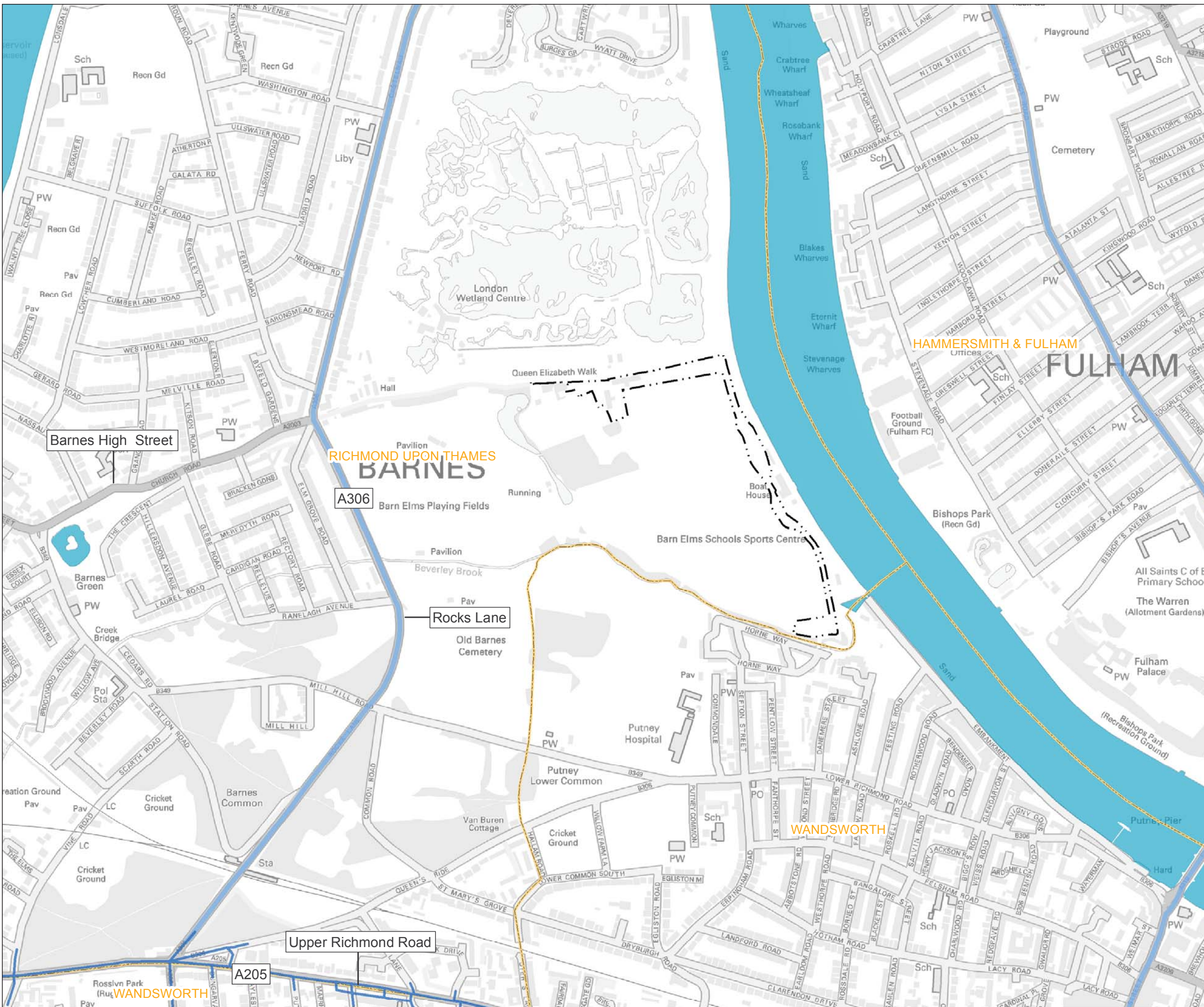


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond

Document Information
Environmental Statement
 Transport - site location plan

Vol.6 Figure 12.4.1
 1PL03-TT-50507
 January 2013



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- Key**
- Cycle parking
 - National rail stations with cycle parking
 - Pedestrian routes
 - Thames path
 - London strategic walk network
 - London cycle routes
 - National cycle network
- Route Type**
- Open Traffic Free
 - Open on-road
 - Limits of Land to be Acquired or Used
 - Local authority boundary

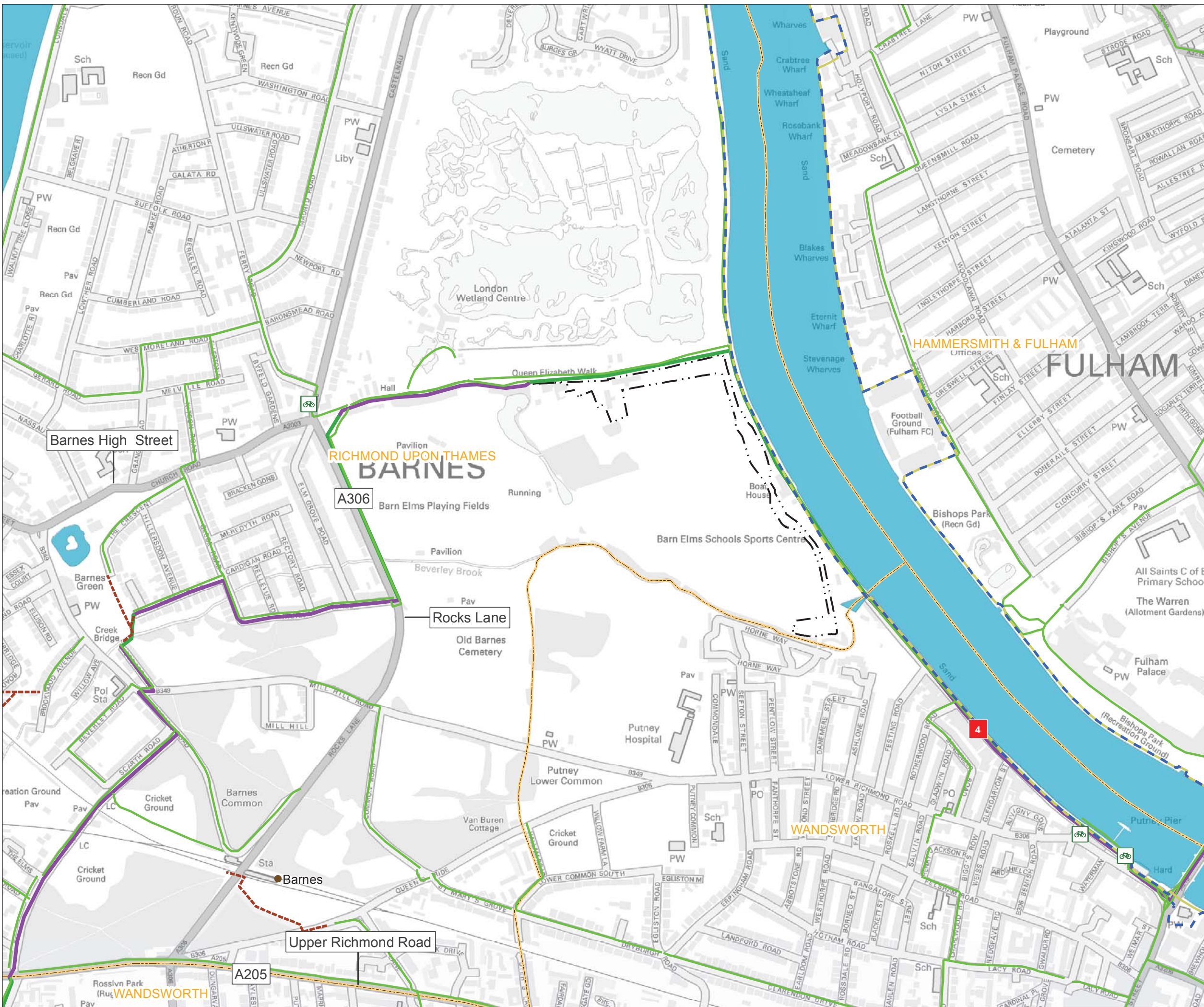
110 55 0 110 m
Scale 1 : 7,500 at A3

FOR INFORMATION

Location
Barn Elms
London Borough of Richmond

Document Information
Environmental Statement
Transport - pedestrian and cycle network

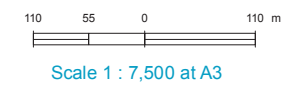
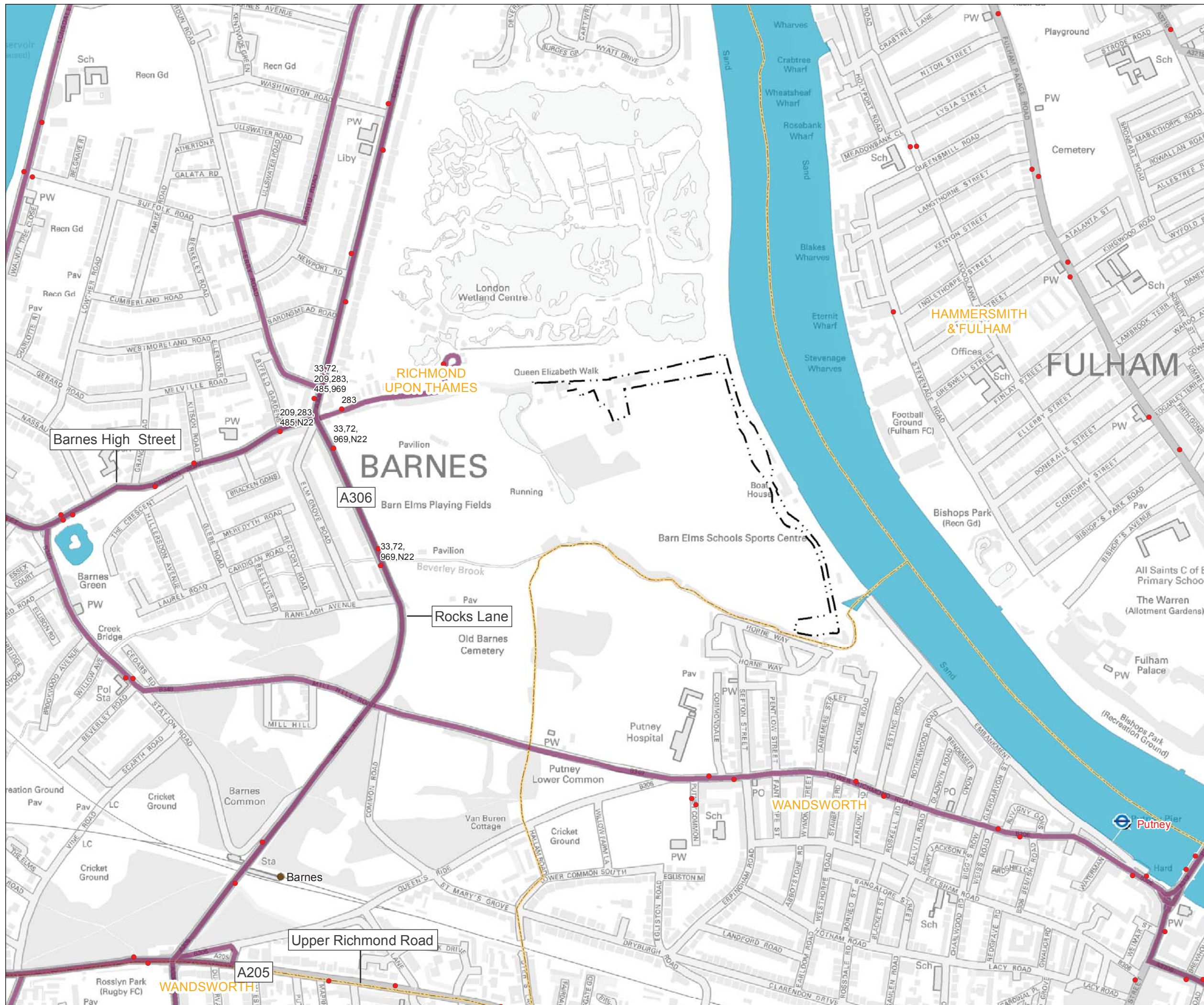
Vol.6 Figure 12.4.2
1PL03-TT-50515
January 2013



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- Key**
- TFL bus stops
 - Pier locations
 - National rail stations
 - TFL bus routes
 - Limits of Land to be Acquired or Used
 - Local authority boundary



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond

Document Information
Environmental Statement
 Transport - public transport

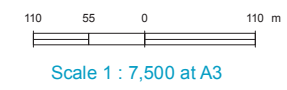
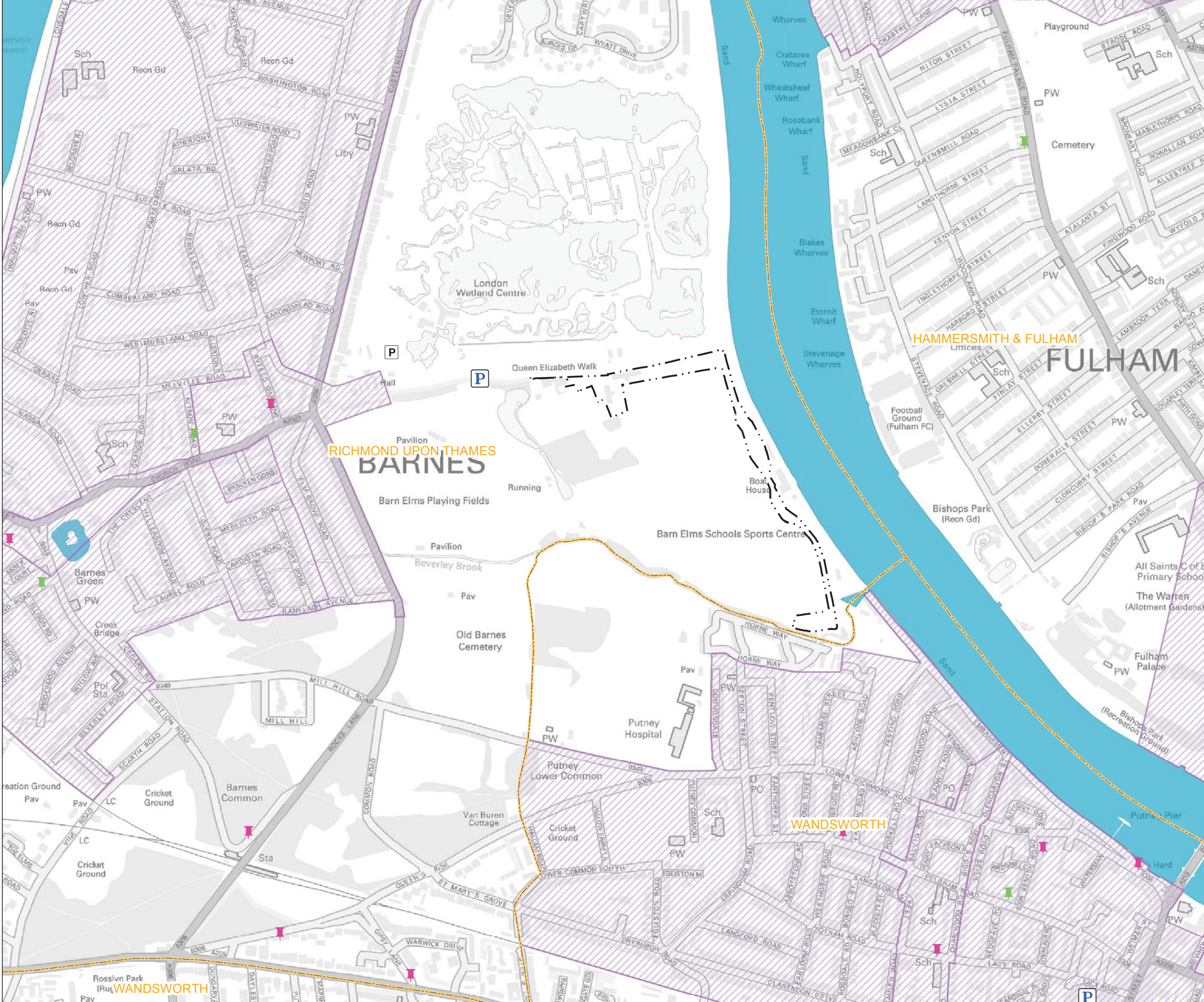
Vol.6 Figure 12.4.3
 1PL03-TT-50523
 January 2013



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- Key**
- City Car
 - Zip Car
 - Private car parking
 - Coach parking
 - Controlled Parking Zones and Hours of Operation
 - Limits of Land to be Acquired or Used
 - Local authority boundary



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond

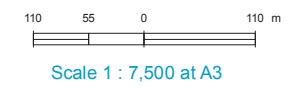
Document Information
Environmental Statement
 Transport - parking

Vol.6 Figure 12.4.4
 1PL03-TT-50531
 January 2013





- Key**
- Automatic traffic count surveys
 - Pedestrian and cycle surveys
 - Junction surveys
 - Parking surveys
 - Limits of Land to be Acquired or Used
 - Local authority boundary

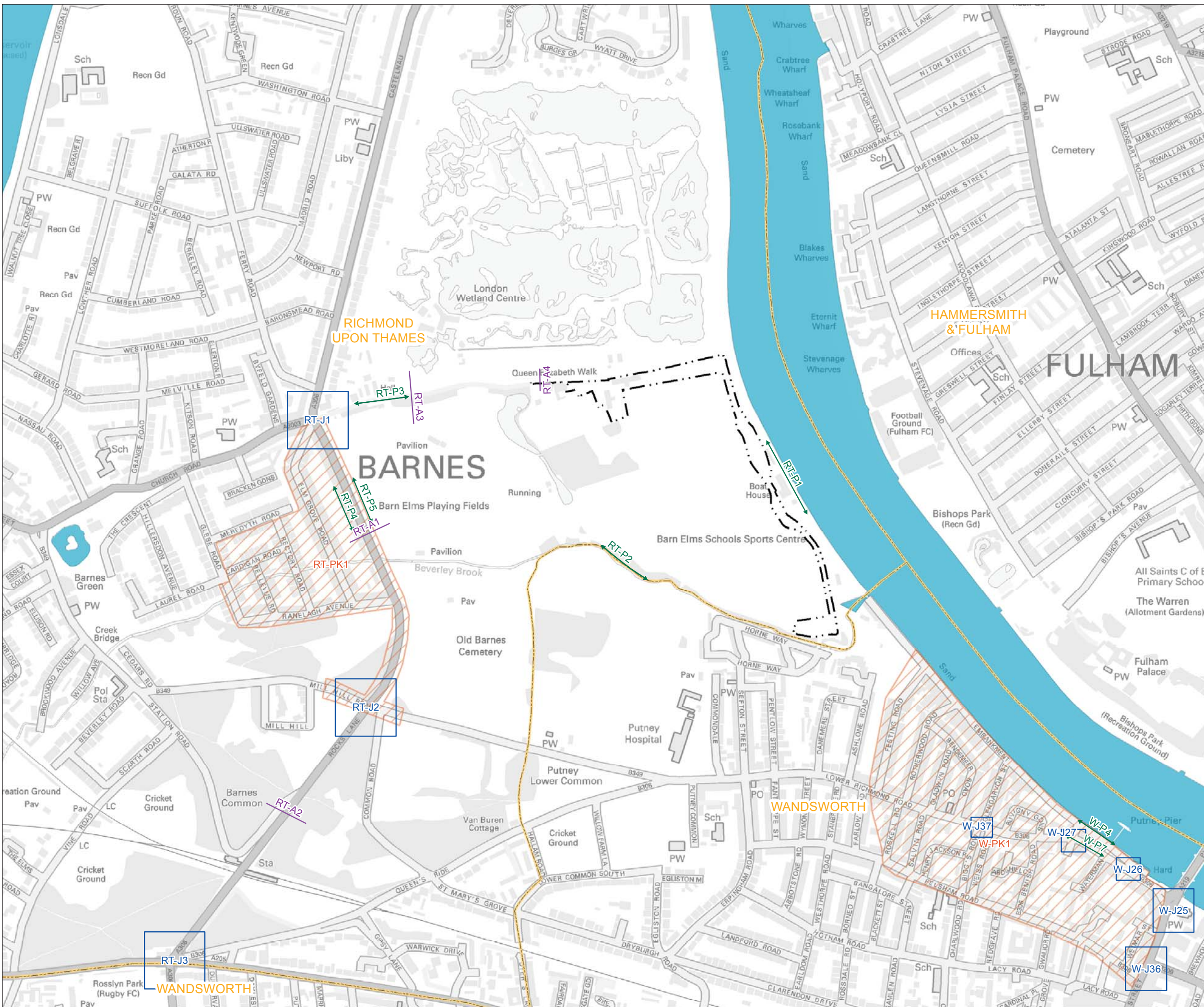


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond

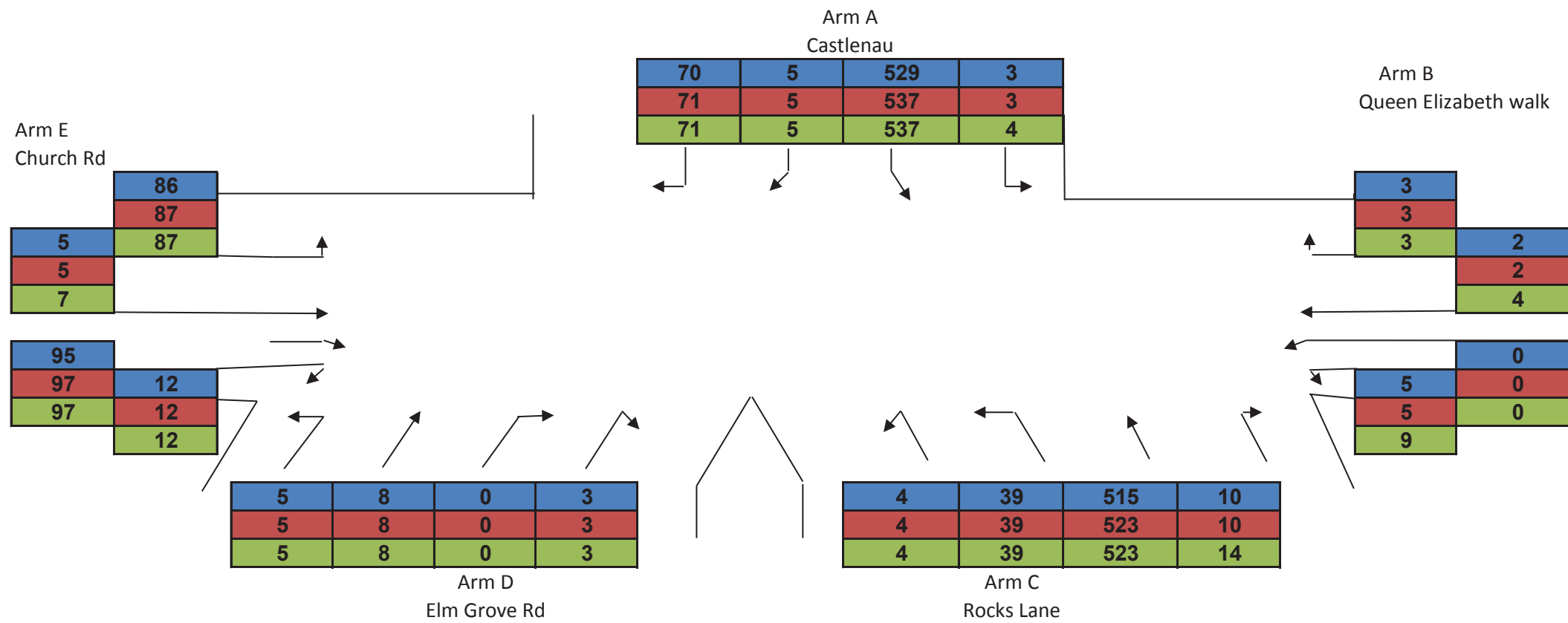
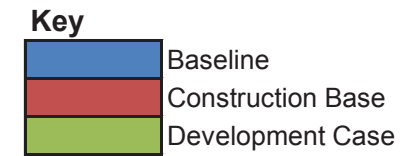
Document Information
Environmental Statement
 Transport - survey locations

Vol.6 Figure 12.4.5
 1PL03-TT-50539
 January 2013



Site: Barn Elms
 Borough: Richmond
 Junction: St Church Rd/ Castlenau/ Rocks Ln
 Junction no.: PBA 8

Data: Traffic Flow in PCUs - AM Peak Hour
 from Traffic Survey



FOR INFORMATION

Location
 Barn Elms
 London Borough of Richmond

Document Information
 Environmental Statement

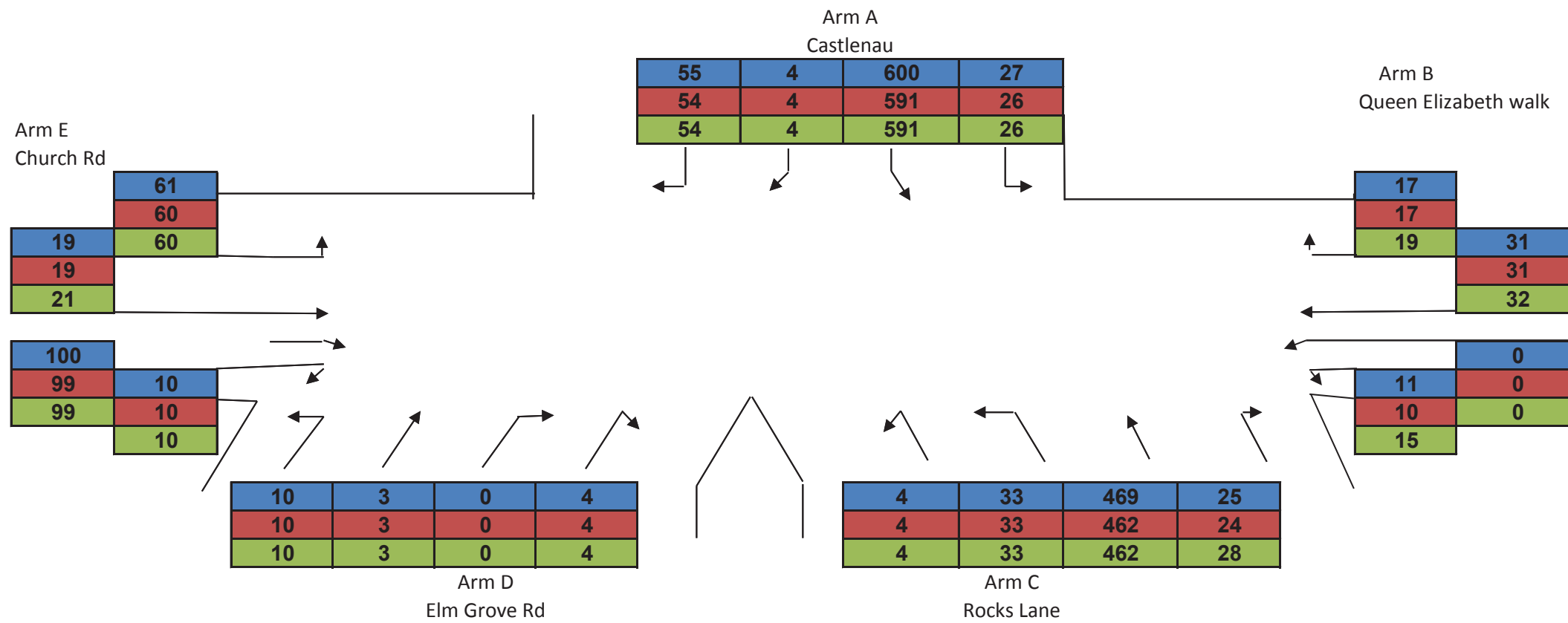
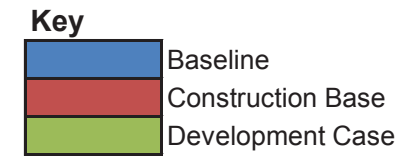
Baseline, Construction and
 Development case traffic flow
 (AM peak hour)

Vol. 6 Figure 12.4.6
 1PL03-TT-50870
 January 2013



Site: Barn Elms
 Borough: Richmond
 Junction: St Church Rd/ Castlenau/ Rocks Ln
 Junction no.: PBA 8

Data: Traffic Flow in PCUs - PM Peak Hour
 from Traffic Survey



FOR INFORMATION

Location
 Barn Elms
 London Borough of Richmond

Document Information
 Environmental Statement

Baseline, Construction and
 Development case traffic flow
 (PM peak hour)

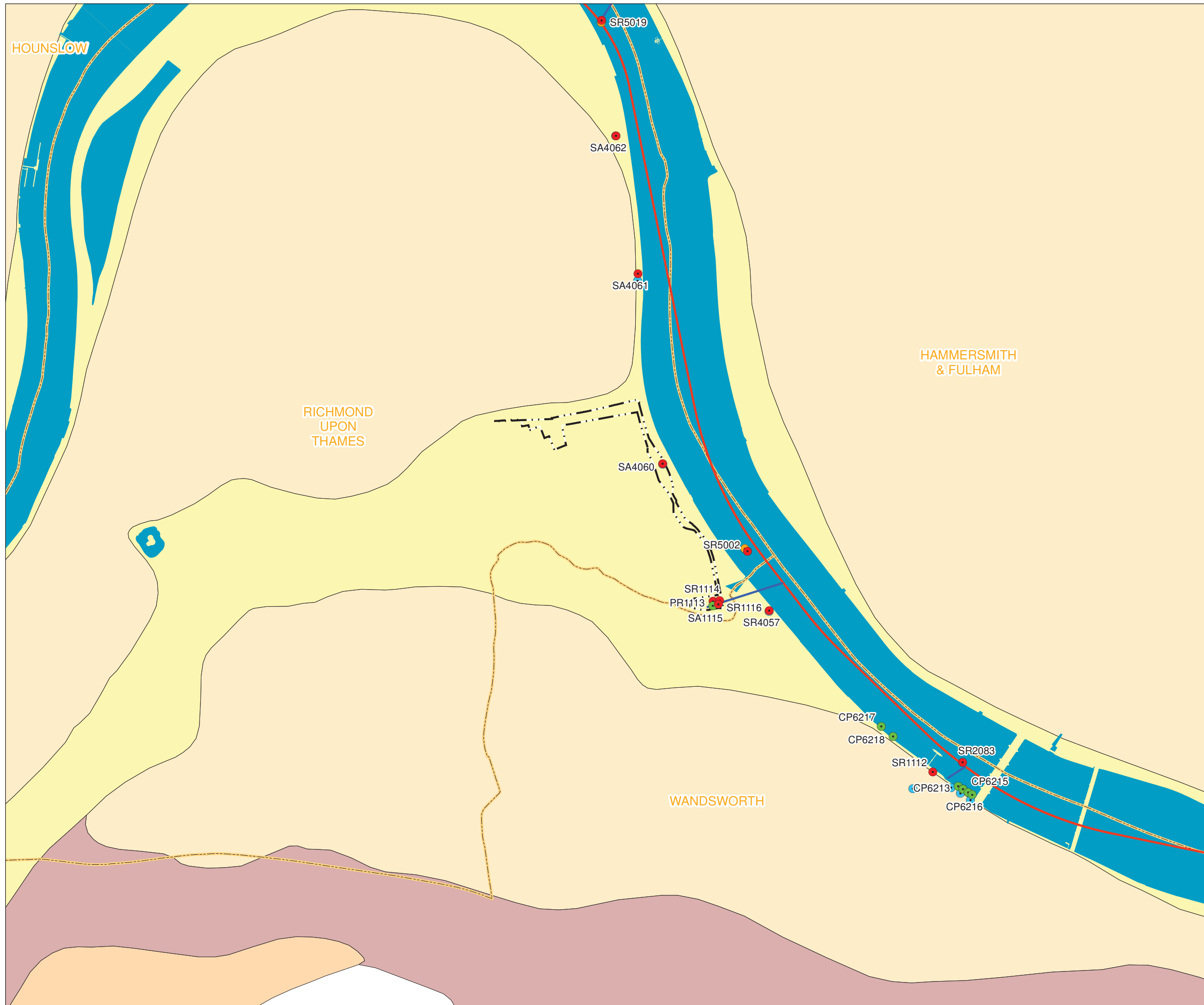
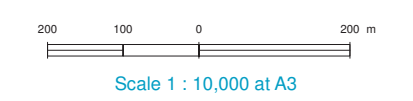
Vol. 6 Figure 12.4.7
 1PL03-TT-50894
 January 2013





Key

- Limits of Land to be Acquired or Used
- Thames Tideway Tunnel
 - Main Tunnel
 - Connection Tunnel
- Local Authority Boundary
- Drilled Boreholes
 - Depth (m)
 - 0 - 10
 - 10 - 30
 - 30+
 - Proposed Boreholes
 - Water
 - Land
 - Superficial Geology
 - Head
 - Alluvium
 - Kempton Park Gravel Member
 - Taplow Gravel Formation



FOR INFORMATION

Location
 Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Water resources – groundwater - superficial geology
 Vol.6 Figure 13.4.1
 1PL03-WR-20112
 January 2013

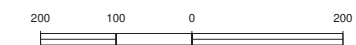


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Key

- Limits of Land to be Acquired or Used
- : Acquired or Used
- Thames Tideway Tunnel**
 - Main Tunnel
 - Connection Tunnel
- Local Authority Boundary
- Drilled Boreholes**
- Depth (m)
 - 0 - 10
 - 10 - 30
 - 30+
- Proposed Boreholes**
 - Water
 - Land
- EA Chalk Piezometric Level (mATD) - Jan 11
- Solid Geology**
 - London Clay Formation



Scale 1 : 10,000 at A3



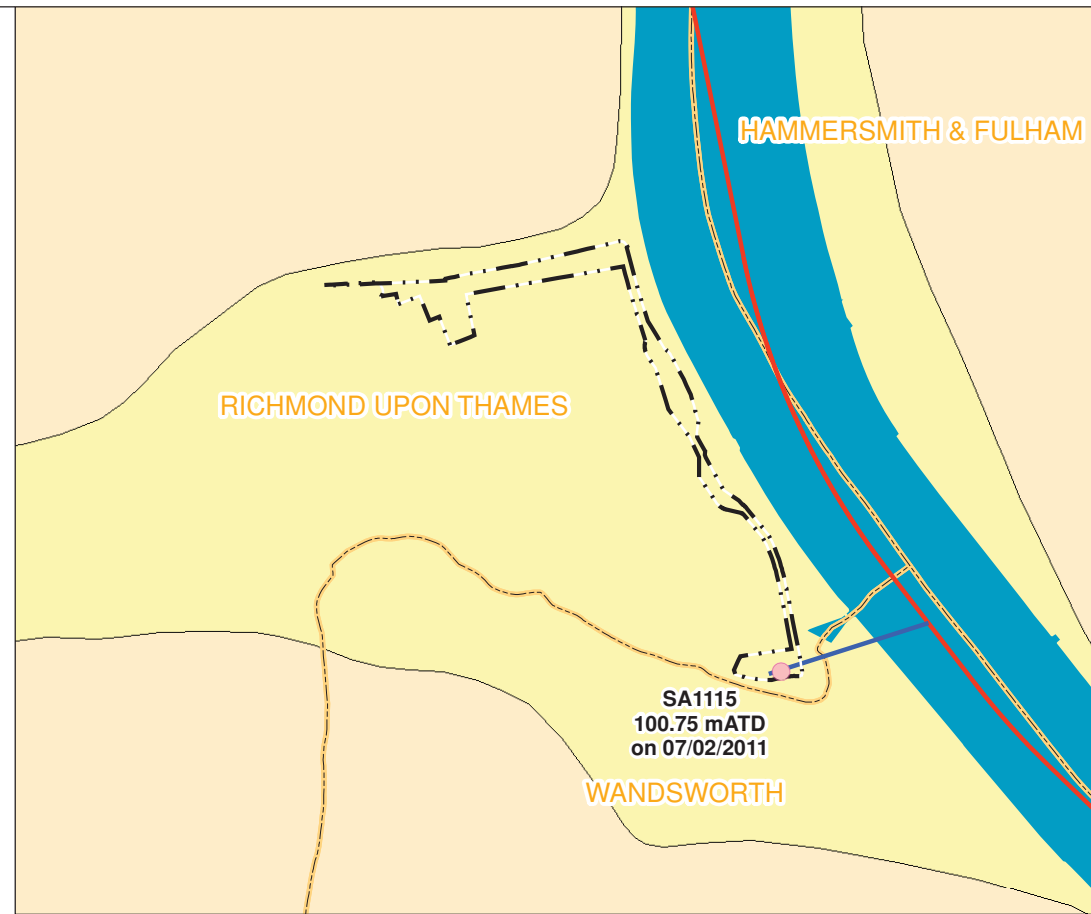
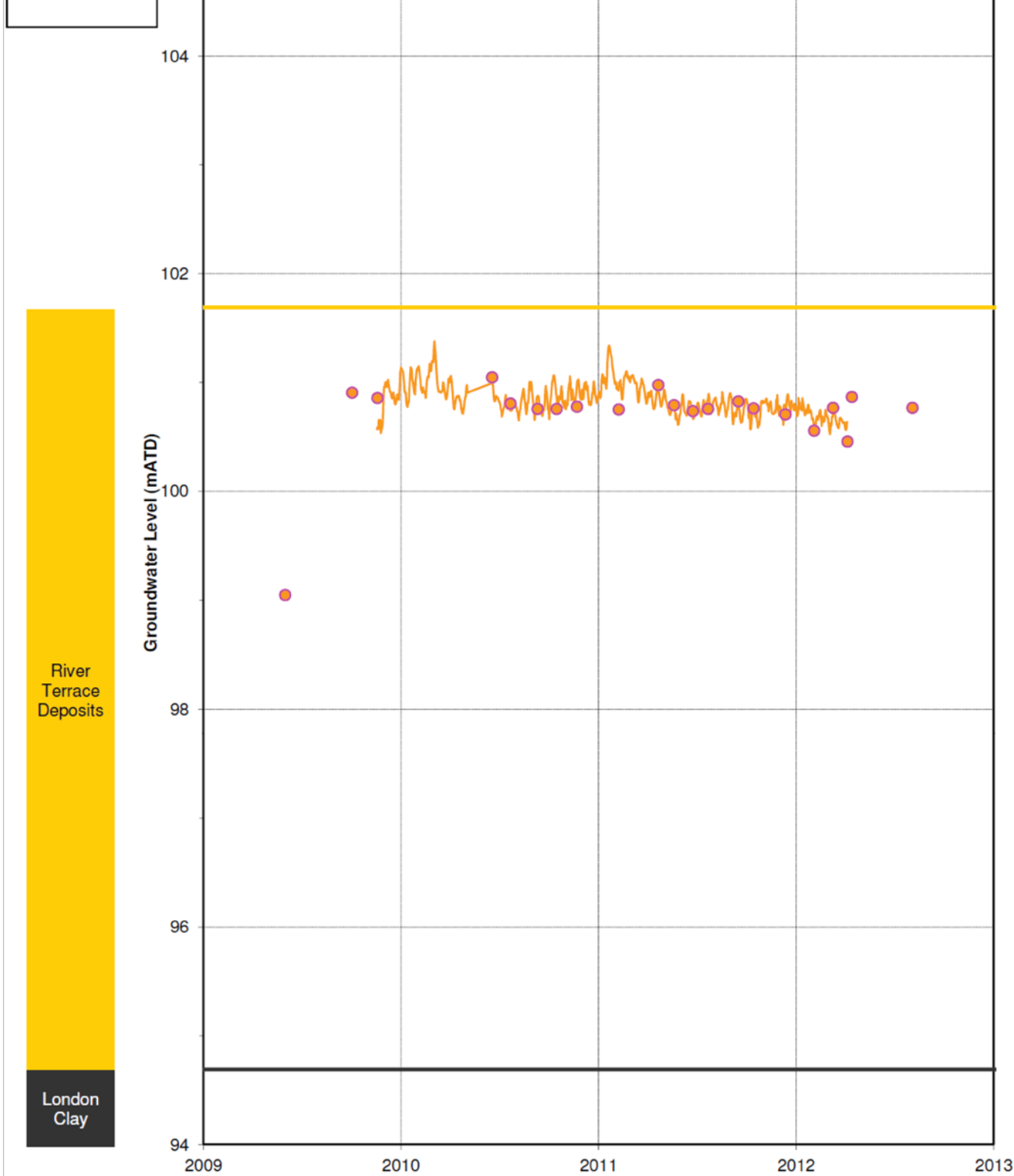
FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

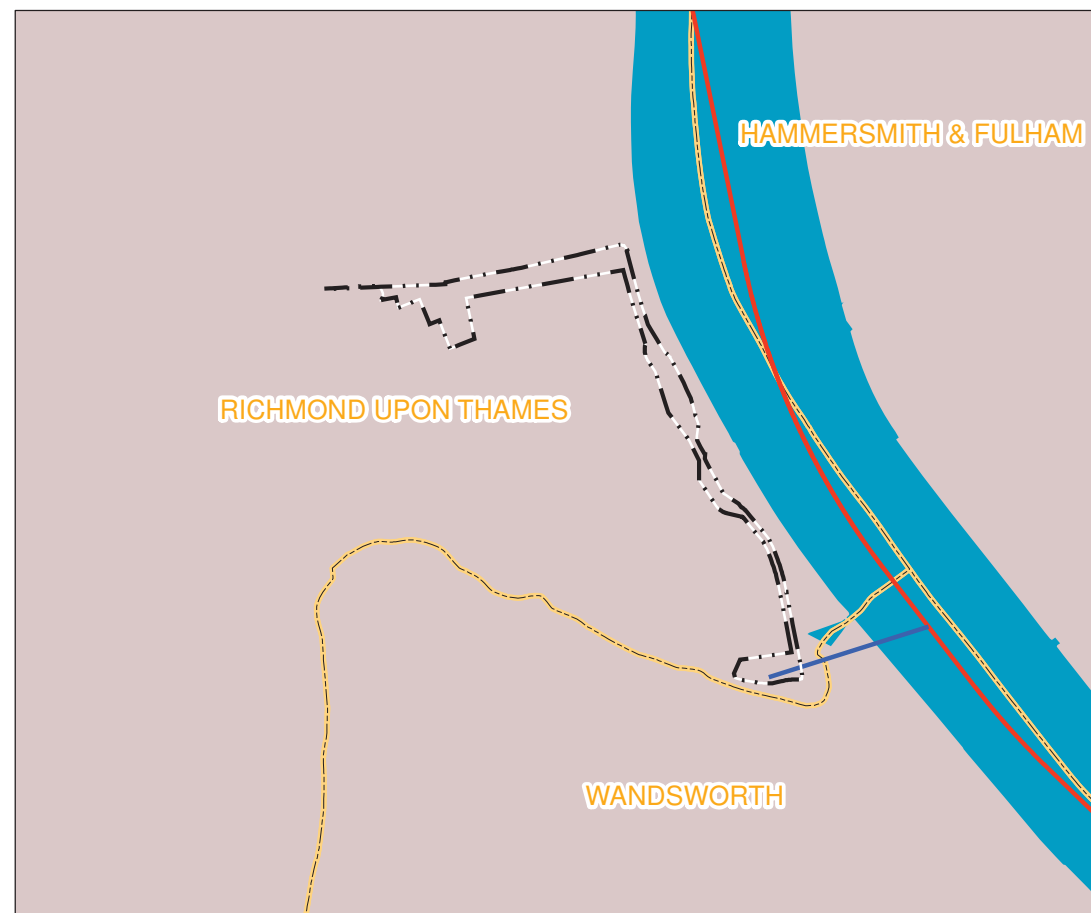
Document Information
Environmental Statement
 Water resources – groundwater - solid geology
 Vol.6 Figure 13.4.2
 1PL03-WR-20113
 January 2013



Geology at the Shaft Site



Upper aquifer monitoring locations

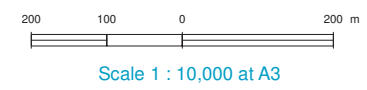


Lower aquifer monitoring locations

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- Key**
- Limits of Land to be Acquired or Used
 - : Acquired or Used
 - Thames Tideway Tunnel**
 - Main Tunnel
 - Connection Tunnel
 - Local Authority Boundary
 - Drilled Boreholes Upper Aquifer Water Levels**
 - SA1115
 - Superficial Geology**
 - Alluvium
 - Kempton Park Gravel Member
 - Solid Geology**
 - London Clay Formation



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Water resources – groundwater - monitoring locations
 Vol.6 Figure 13.4.3
 1PL03-WR-20114
 January 2013

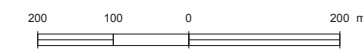


Keyplan:



Key

- Limits of Land to be Acquired or Used
- Automatic Quality Monitoring Station Locations



Scale 1 : 10,000 at A3

FOR INFORMATION

[Location](#)

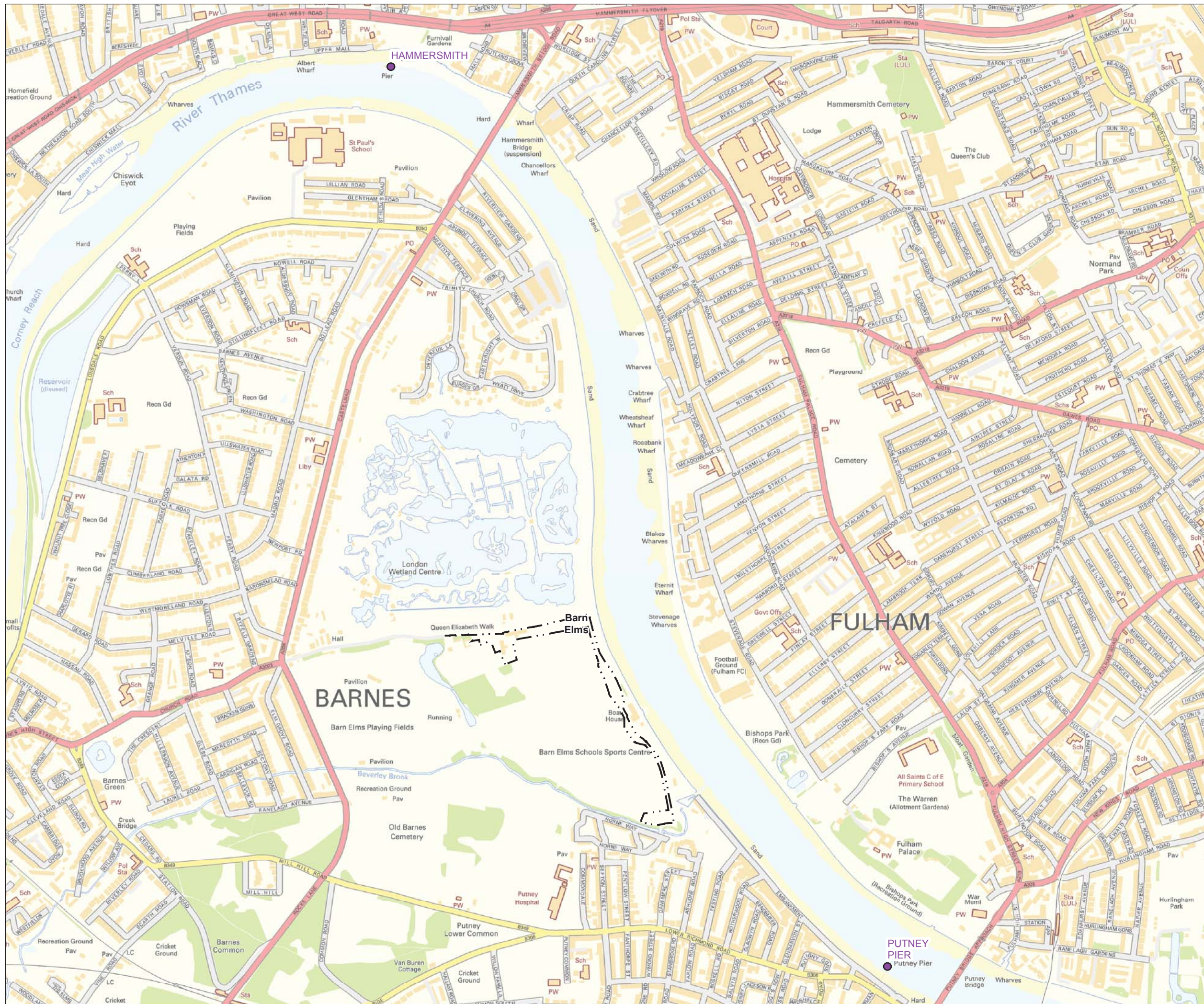
Barn Elms
London Borough of Richmond upon Thames

[Document Information](#)

Environmental Statement

Water resources - surface water - water quality monitoring points
Vol.6 Figure 14.4.1

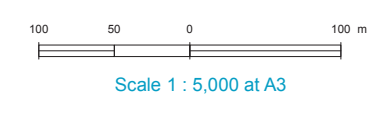
1PL03-WR-21003
January 2013



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- Key**
- Limits of Land to be Acquired or Used
 - Thames Tidal Defences
 - EA Flood Zone 3
 - EA Flood Zone 2

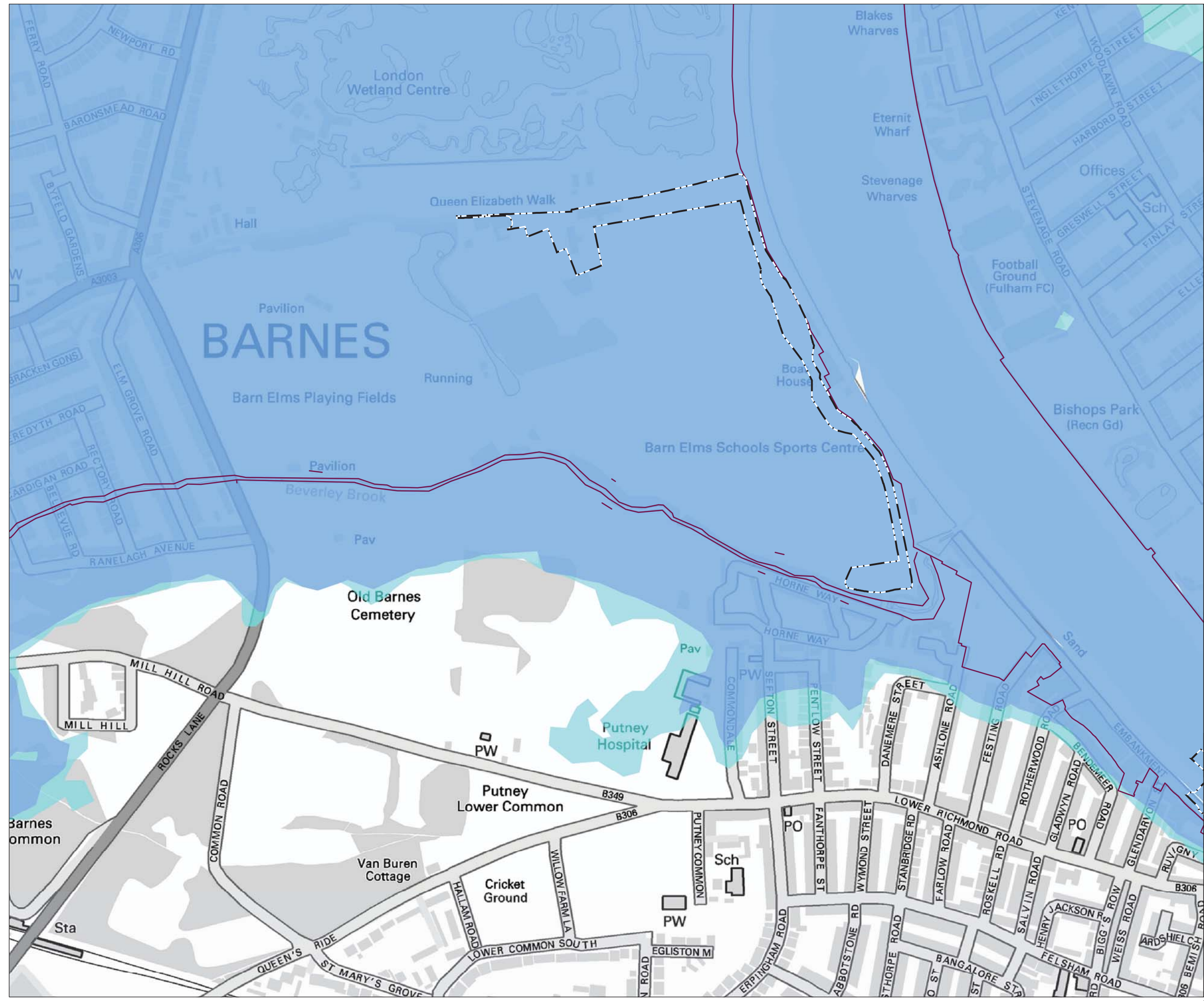


FOR INFORMATION

Location
Barn Elms
London Borough of Richmond upon Thames

Document Information
Environmental Statement
Flood risk - EA flood zones

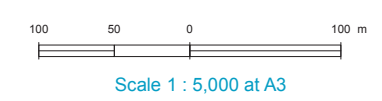
Vol.6 Figure 15.3.1
1PL03-FL-20129
January 2013



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- Key**
- - - Limits of Land to be Acquired or Used
 - Thames Tidal Defences
- Beverley Brook Flood Depth (m) 1% AEP + Climate Change**
- <0.01
 - 0.01 - 0.25
 - 0.25 - 0.50
 - 0.50 - 1.00
 - 1.00 - 2.00
 - >2.00

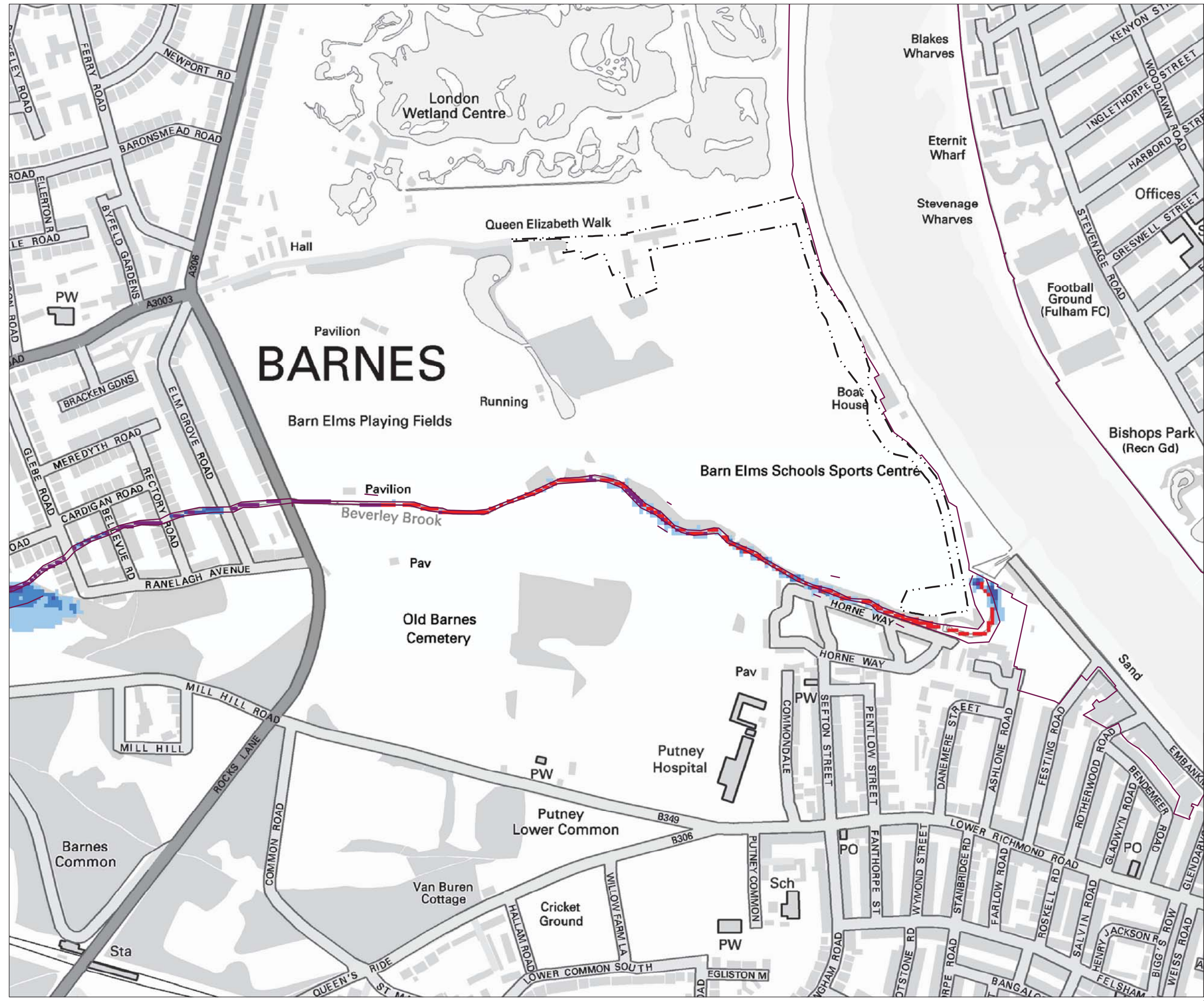


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Flood risk - Beverley Brook flood depth (m)

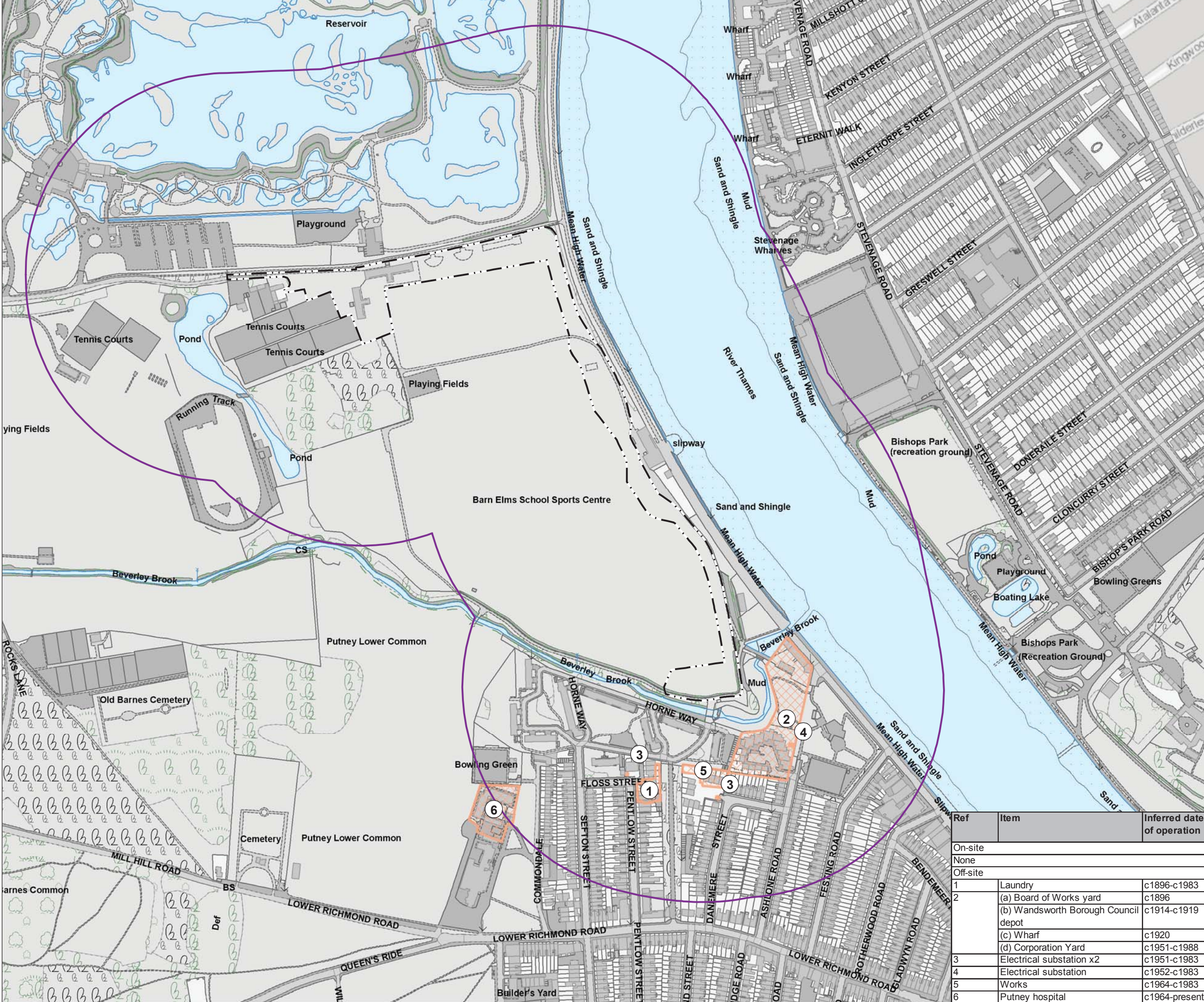
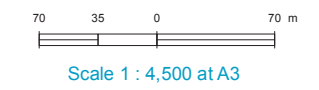
Vol.6 Figure 15.3.2
 1PL03-FL-20130
 January 2013



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- Key
- Limits of Land to be Acquired or Used
 - Limit of Land 250m Buffer
 - Potentially Contaminating Land-Uses



FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond

Document Information
Environmental Statement
 Land quality - potentially contaminating land-uses
 Vol.6 Figure F.1.1
 1PL03-LQ-30073
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Ref	Item	Inferred date of operation
On-site		
None		
Off-site		
1	Laundry	c1896-c1983
2	(a) Board of Works yard	c1896
	(b) Wandsworth Borough Council depot	c1914-c1919
	(c) Wharf	c1920
	(d) Corporation Yard	c1951-c1988
3	Electrical substation x2	c1951-c1983
4	Electrical substation	c1952-c1983
5	Works	c1964-c1983
6	Putney hospital	c1964-present



Keyplan:



Key

Drilled Boreholes

Depth (m)

- 0 - 10
- 10 - 30
- 30+

- Limits of Land
- to be Acquired or Used
- Limit of Land 250m Buffer

70 35 0 70 m

Scale 1 : 4,500 at A3

FOR INFORMATION

Location

Barn Elms
London Borough of Richmond

Document Information

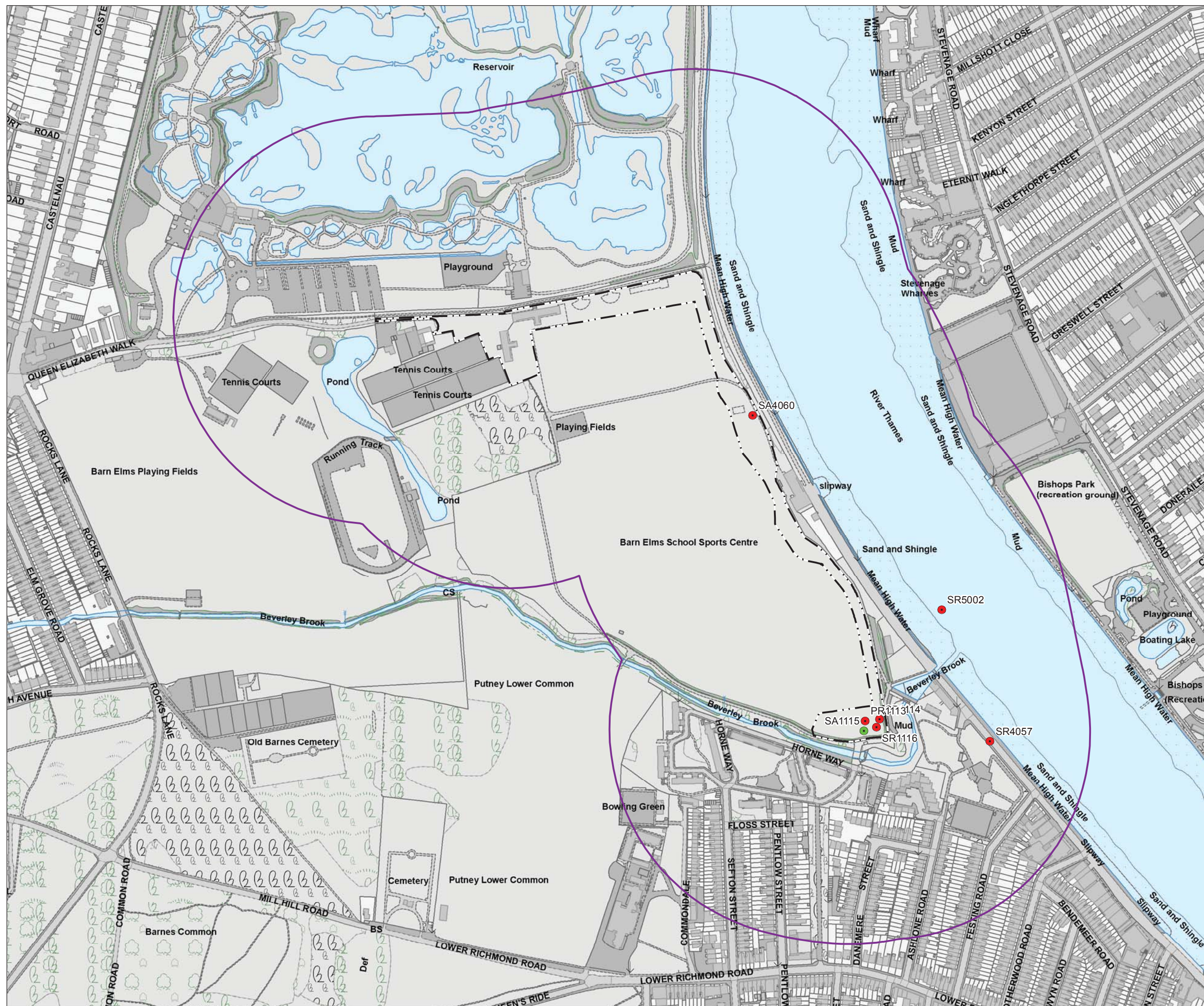
Environmental Statement

Land quality - borehole locations

Vol.6 Figure F.1.2

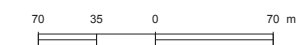
1PL03-LQ-30074

January 2013





- Key**
- Limits of Land
 - - - to be Acquired or Used
 - Limit of Land 250m Buffer
- Waste**
- ▲ Past Potential Contaminated Industrial Uses
- Hazards**
- Pollution Incidents to Controlled Waters
 - LA Pollution Prevention & Controls
 - ▲ Past Potentially Contaminated Industrial Uses



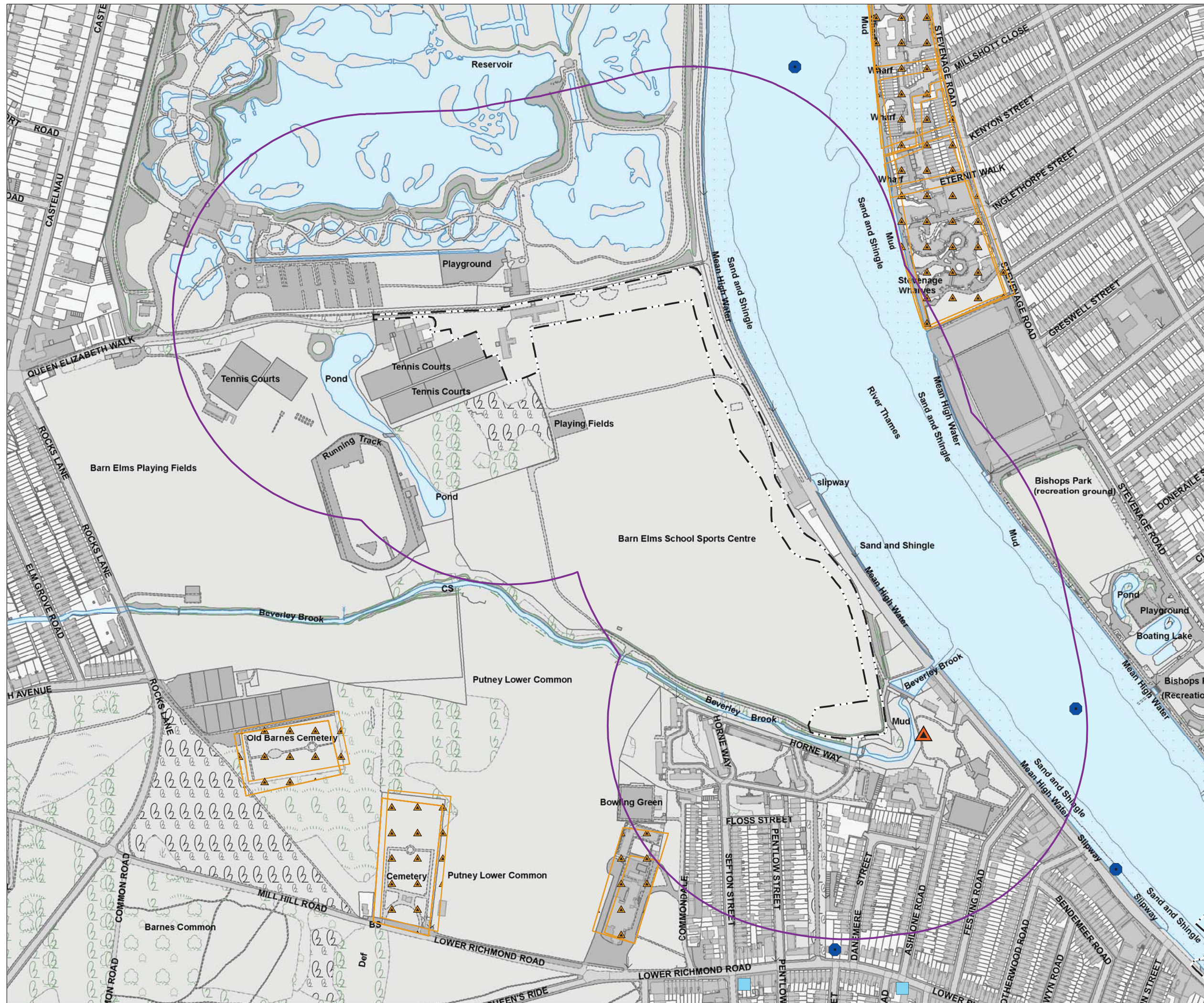
Scale 1 : 4,500 at A3

FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond

Document Information
Environmental Statement
 Land quality - hazard and waste sites

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 1PL03-LQ-30075
 January 2013



Keyplan:



Key

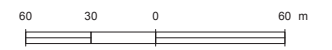
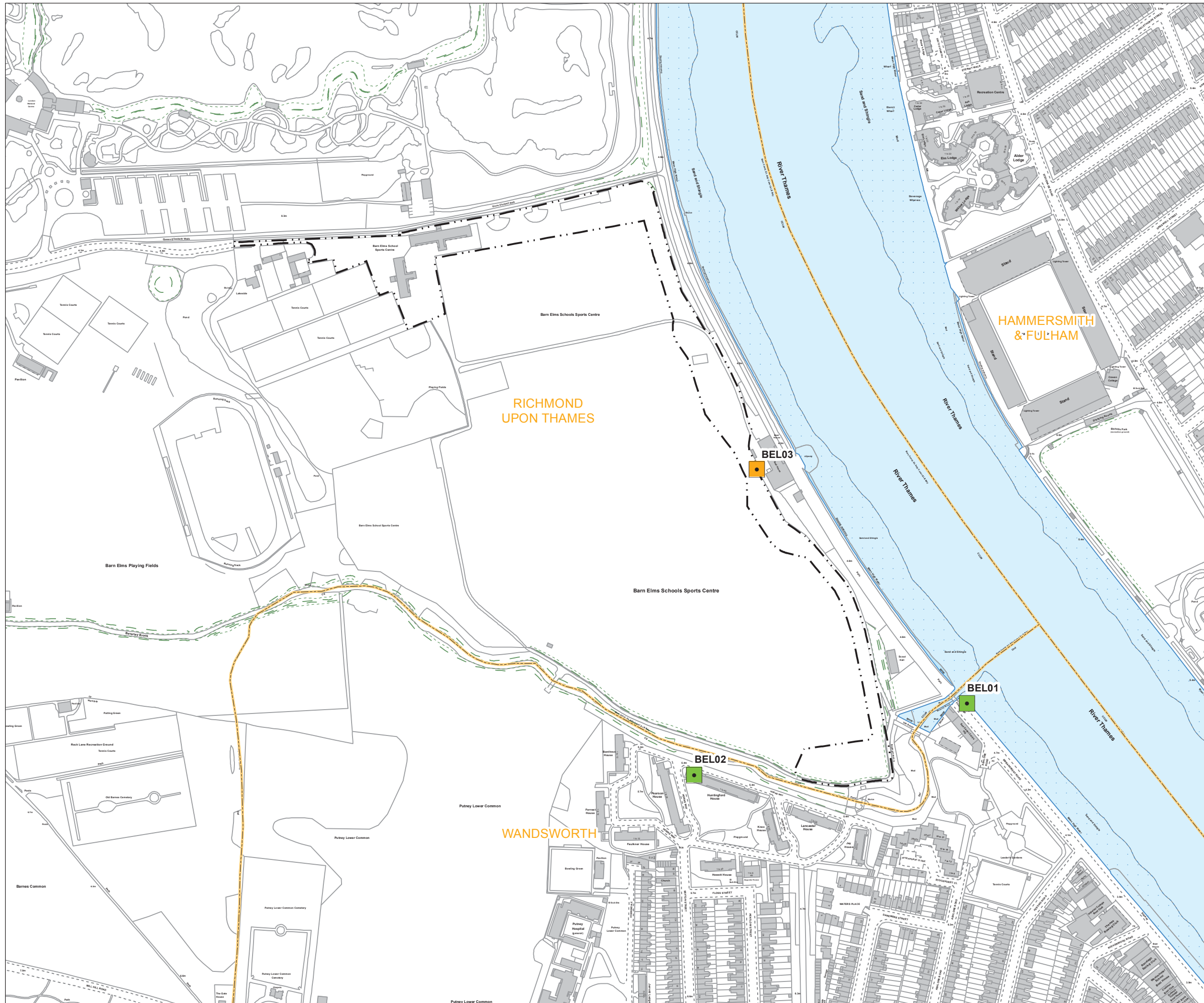
— Limits of Land to be Acquired or Used

Local Authority Boundary

Noise Survey Locations

Attended

Unattended



Scale 1 : 3,500 at A3

FOR INFORMATION

Location

Barn Elms
London Borough of Richmond upon Thames

Document Information

Environmental Statement

Noise and vibration - noise survey locations

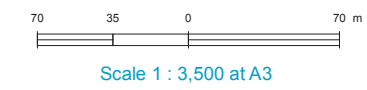
Vol.6 Figure G.1

1PL03-NV-40140

January 2013



- Key**
- Survey Point
 - 1. Thames Path and National Cycle Route 4 North of Barn Elms Boat House
 - 2. Thames Path and National Cycle Route 4 at Mouth of Beverley Brook
 - 3. Beverley Brook Walk Public Footpath
 - 4. Queen Elizabeth Walk
 - Survey Zone
 - 5 - Barn Elms Playing Fields, London Borough of Richmond upon Thames
 - 6 - Barn Elms Schools Sports Centre, London Borough of Wandsworth
 - Beverley Brook Footpath Diversion in Place During 2011 Survey
 - Beverley Brook Footpath
 - Queen Elizabeth Walk
 - Thames Path

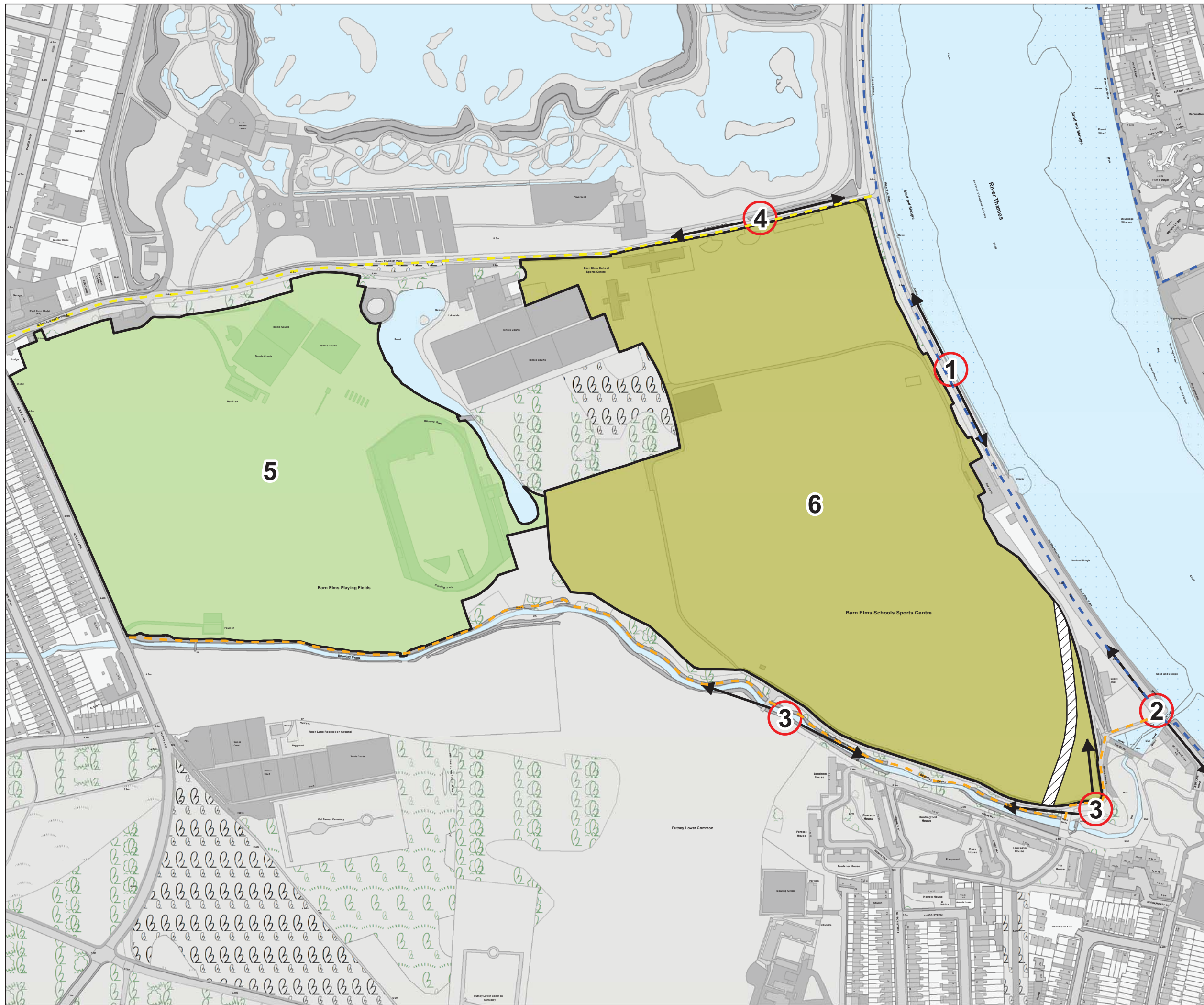


FOR INFORMATION

Location
Barn Elms
 London Borough of Richmond upon Thames

Document Information
Environmental Statement
 Socio-economics - usage survey plan

Vol.6 Figure H.1
 1PL03-SE-20029
 January 2013



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