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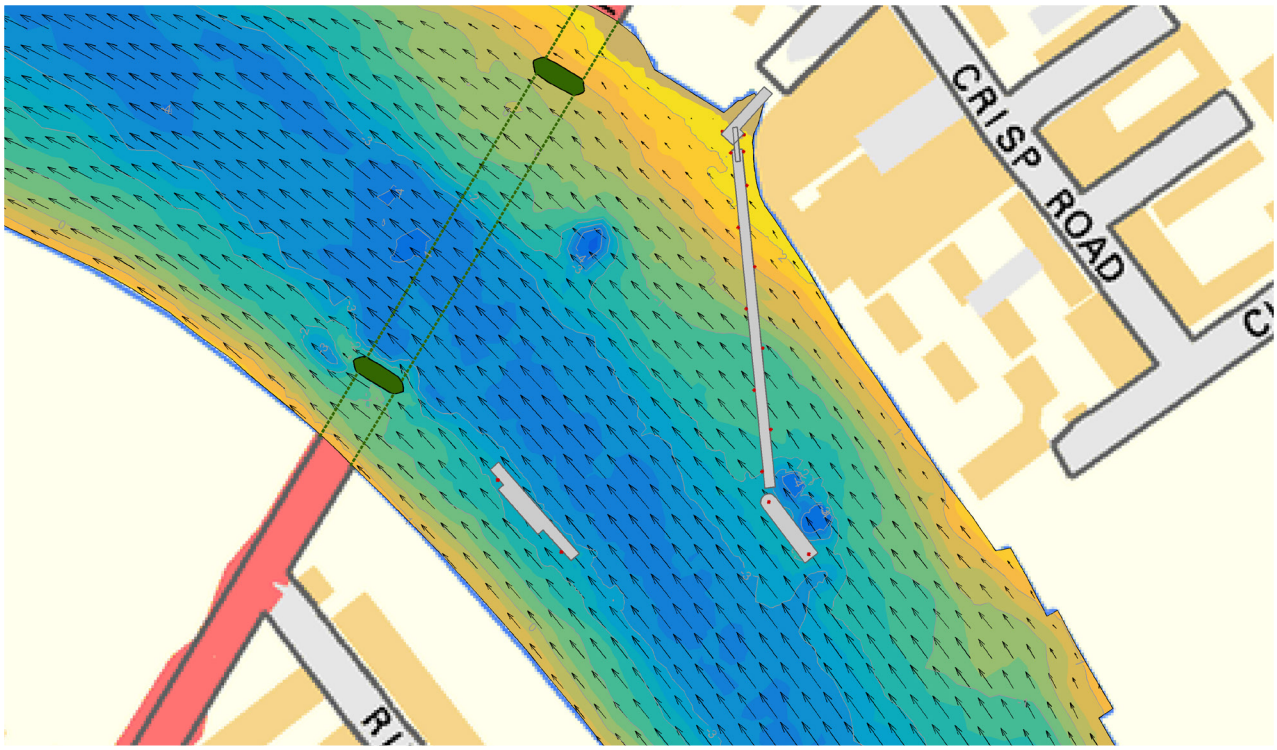
Hammersmith Temporary Ferry

Water Framework Directive Assessment



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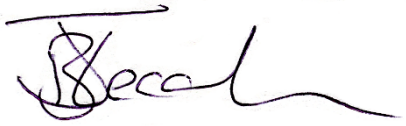

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1. Introduction

1.1. Background

This report was produced by HR Wallingford on behalf of Thames Clipper to Transport for London. This report presents the findings of a Water Framework Directive Assessment for the proposed Temporary Hammersmith Ferry, adjacent and to the east of the Hammersmith Bridge. The Hammersmith Refurbishment project is a separate development and is not considered within this report.

1.2. Project overview

To facilitate the refurbishment works and enable repairs for Hammersmith Bridge, a temporary ferry service is required to provide pedestrian and cycling access over the River Thames. The temporary ferry service, located to the east of Hammersmith Bridge, will provide temporary access for pedestrians and cyclists to cross the River Thames.

The Temporary Piers will be located on either side of the river, immediately downstream of Hammersmith Bridge. Hammersmith Pier on the north bank will land at the end of Queen Caroline Street, while Barnes Pier will land on the Thames towpath on the south bank.

Both the Hammersmith Pier and Barnes Pier which make up the Hammersmith Ferry service are to be temporary installations for an intended period of 3 years with a maximum of 5 years. The design of each structure has therefore been completed with ease of removal as a key criterion.

1.3. Location and description of the proposed development

The temporary crossing as proposed is shown in the general arrangement drawing in Figure 1.1. Two new temporary piers are proposed as ferry terminals, Hammersmith Pier (Figure 1.2 and Figure 1.3) on the north bank and Barnes Pier (Figure 1.4) on the south bank. In terms of structural marine elements:

1.3.1. Hammersmith Pier

The proposed Hammersmith Pier is to land on the public slipway located at the end of Queen Caroline Street. The slipway is seldom used and is closed off with timber flood boards. Access to the pier is to be via a lightweight steel ramp that will span over the flood boards.

A modular floating walkway (using units by EZ Dock) will span between the flood defence wall and a second-hand barge, modified for use as a pier. The walkway will be restrained by temporary tubular piles of up to 0.5 m in diameter. The required piling is to be minimised to avoid major impacts and disturbance to the river environment.

The barge will be restrained by a pair of spud legs – these have been selected given their temporary nature and lesser impact when compared to piles. The pier is skewed downstream to facilitate passage of large vessels beneath Hammersmith bridge (the bridge is open for occasional navigation when no works are in progress on the bridge).

Hammersmith Pier has a shorter pier and similar arrangement of two restraining piles, a floating walkway and a transition platform with two piles. The floating walkway comprises 11 restraining temporary piles at 15 m intervals, and rests on the foreshore at low water.

1.3.2. Barnes Pier

The proposed Barnes Pier is formed from the old Savoy pier, itself a temporary structure, which will be repurposed for this development. The pier will be modified such that is restrained by a pair of spud legs rather than its current radial arms to minimise the impact on the foreshore.

Access to the pier is by an aluminium linkspan, connecting to the landside towpath. The towpath is located beneath Flood Defence Level and floods on some spring tides. As part of the works, a lightweight steel frame walkway will be installed to allow dry access to the pier

Barnes Pier comprises two new temporary piles of around 1 m diameter restraining a pier of dimensions approximately 40 m long and 10 m wide.

1.3.3. Plough dredging

Approximately 120 m^3 of sediment to be levelled by plough dredging in and around the area of the Hammersmith pier to allow vessels to come alongside at low tide. The location of the sediment to be levelled in relation to the Hammersmith pier is shown in Figure 1.5. The maximum height to be levelled at any location is circa 450 mm. The c.120 m^3 of sediment will be plough dredged downstream.

1.3.4. Programme

Construction is anticipated to begin in early June 2021 with offsite construction activities. Works on site will commence from July 19th 2021 and be completed by the end of August 2021. These dates remain subject to attaining the relevant licensing and consents for the works.

1.3.5. Construction

The first activity on site will be the bathymetric and UXO surveys. A proof dig at the pile line will also be carried out. Following this, the temporary piers will be installed following Red7 Marine's method statement. All piles will be driven by the crawler crane mounted on a spud leg barge. A jack-up barge will act as a piling gate where accessible. In the case of the 4 most northern piles, a landside excavator will act as the piling gate.

Non-percussive piling methods will be used to install the tubular piles. Soft-start vibratory piling methods (high-frequency, variable moment resonant free vibratory hammer) will be used instead to embed the piles ~4m into the riverbed, therefore, the noise and vibratory effects will be significantly reduced and less harmful to the surroundings. Piles will be driven dry where possible, and in the minimum water level possible where not possible. The plant requires a minimum water depth of 2 m to safely carry out the works. The methodology utilises low water piling techniques to reduce noise and vibration effects throughout the works.

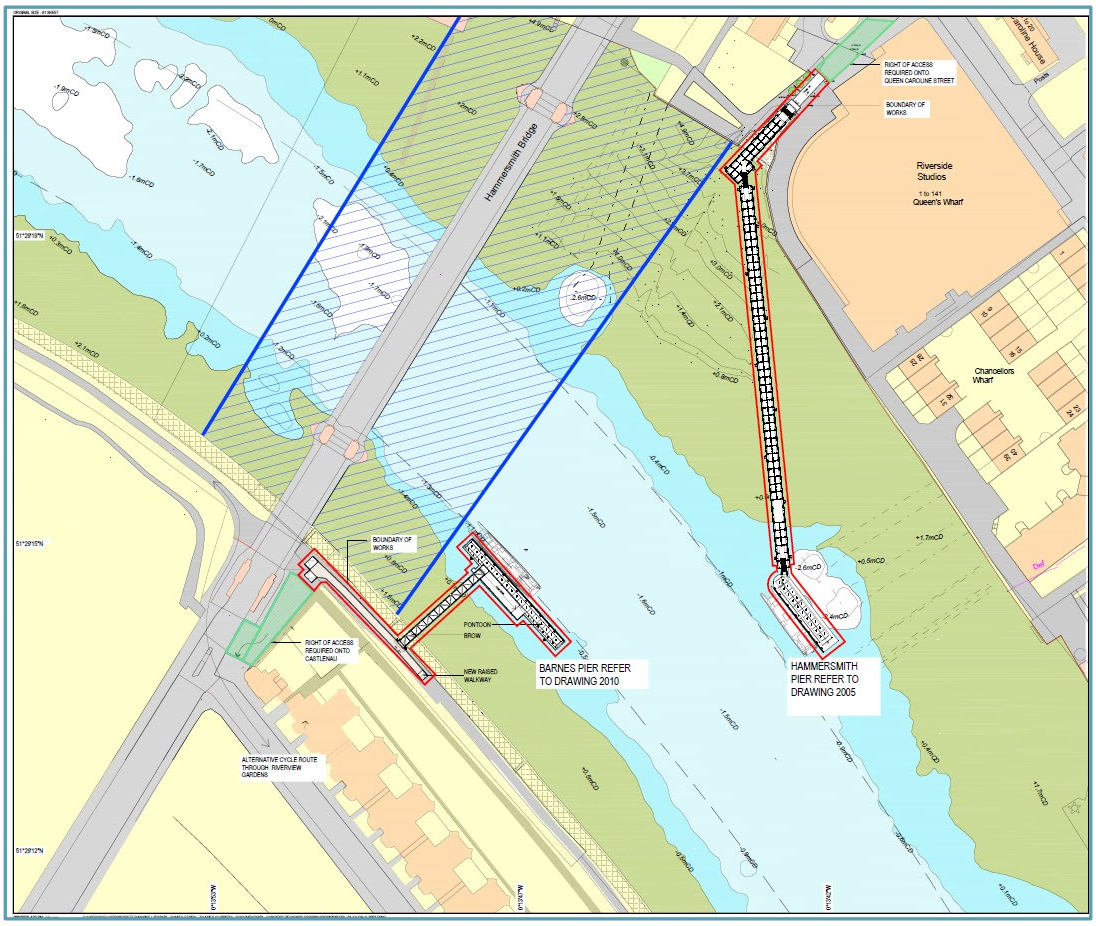

Figure 1.1: Proposed temporary hammersmith ferry location

Source: Beckett Rankine, drawing 2001

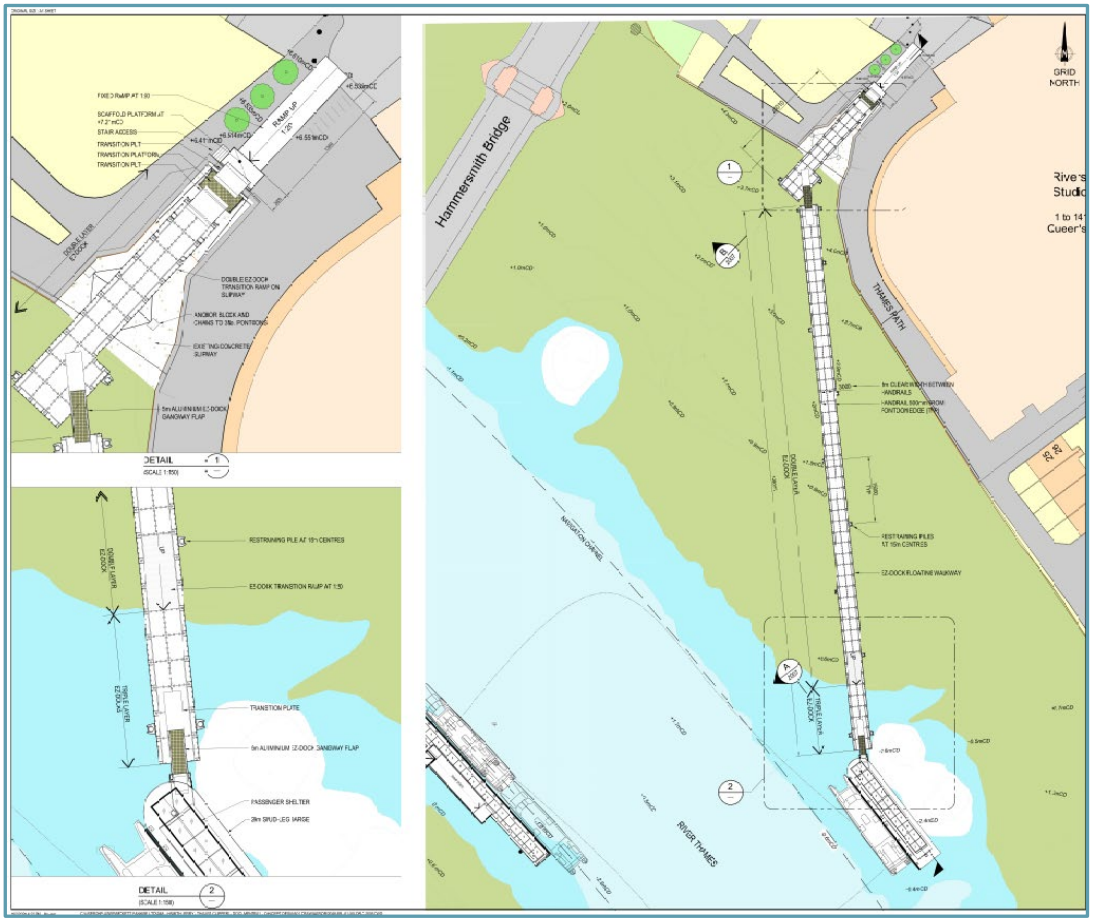

Figure 1.2: Hammersmith pier detail

Source: Beckett Rankine, drawing 2005

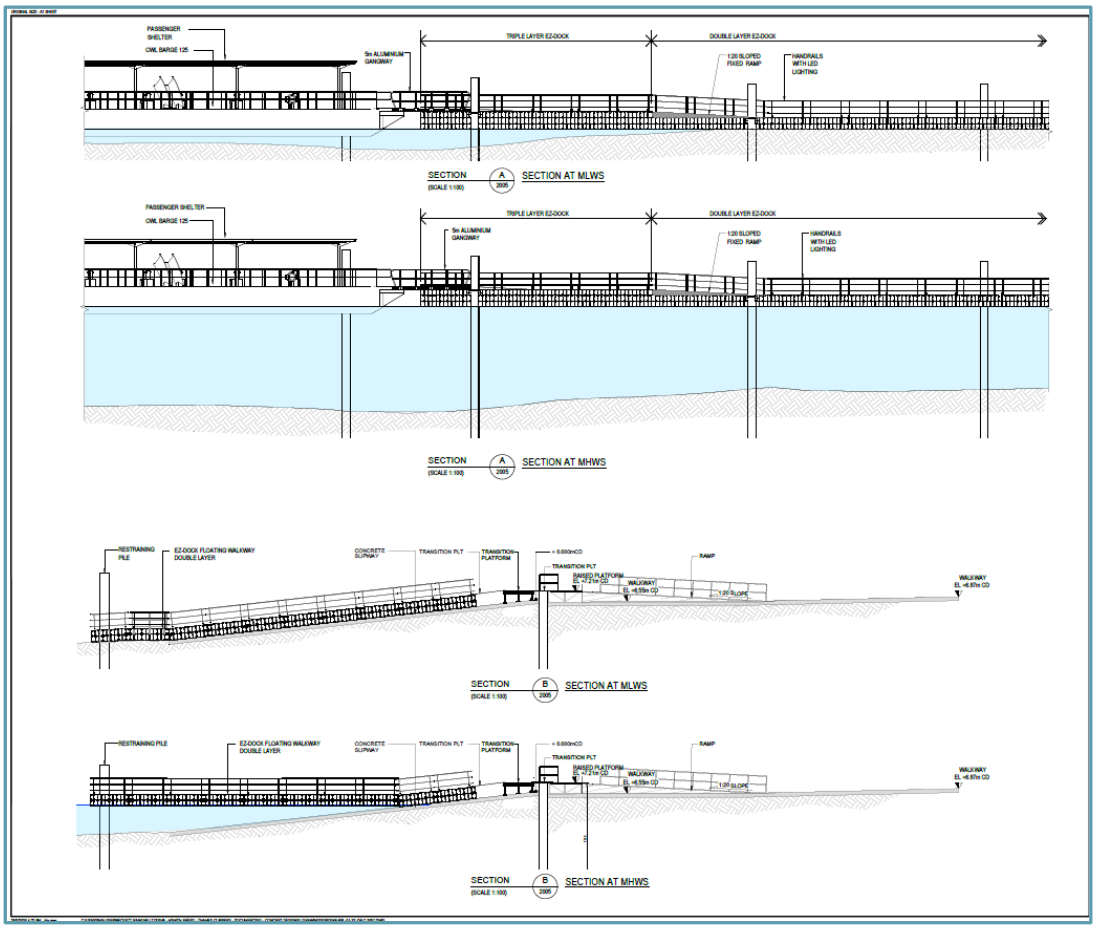

Figure 1.3: Sections at Hammersmith pier

Source: Beckett Rankine, drawing 2007

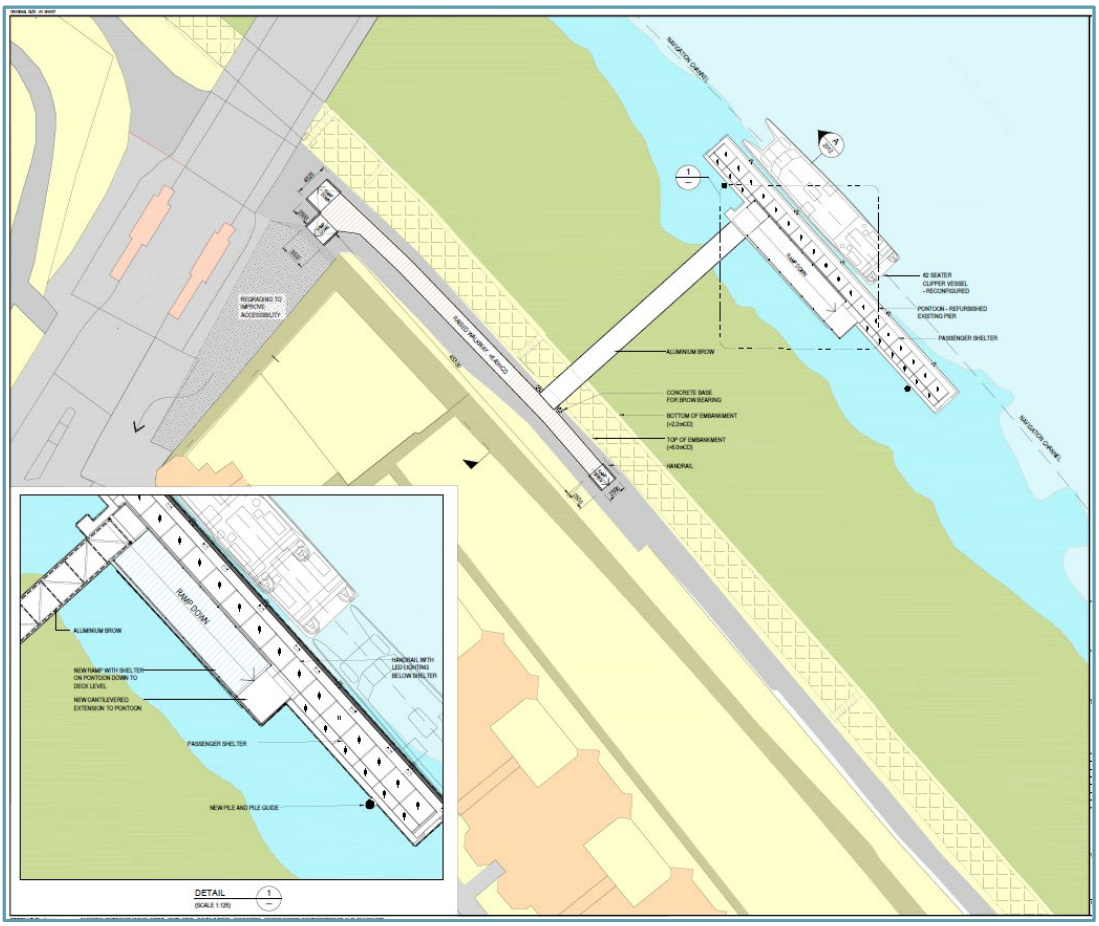

Figure 1.4: Barnes pier detail

Source: Beckett Rankine, drawing 2010

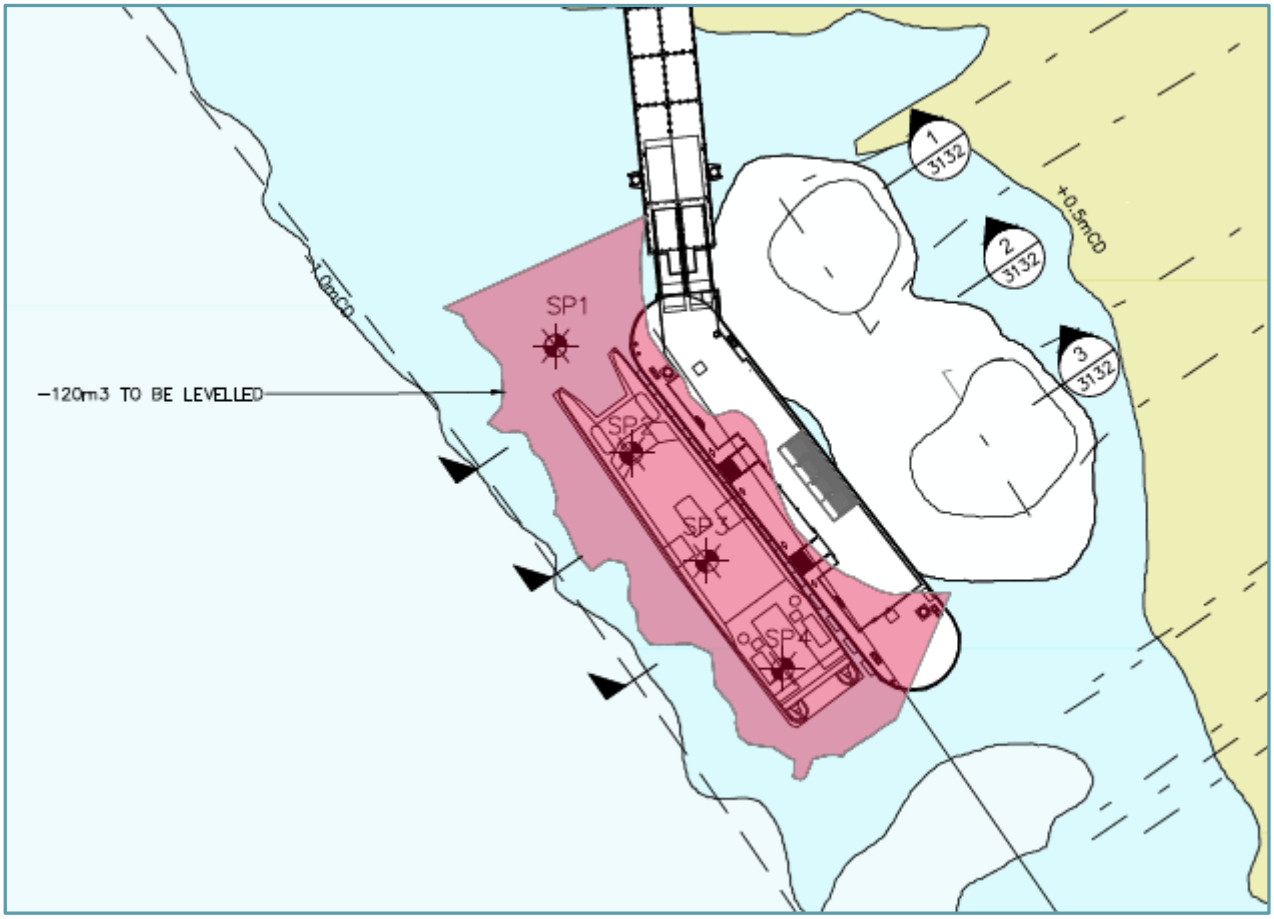

Figure 1.5: Location of sediment to be levelled via plough dredger

Source: Thames Clipper drawing: 2048-BRL-02-XX-DR-C-3131

2. WFD assessment methodology

2.1. The Water Framework Directive

The WFD (2000/60/EC) came into force in 2000 and establishes a framework for the management and protection of Europe's water resources. It was implemented in England and Wales through the Water Environment (WFD) (England and Wales) Regulations 2003 (the Water Framework Regulations). These Regulations were superseded in April 2017 by the Water Environment (WFD) (England and Wales) Regulations 2017. The overall objective of the WFD is to achieve good status (GS) in all inland, transitional, coastal and ground waters, unless alternative objectives are set and there are appropriate reasons for time limited derogation.

The environmental objectives of the WFD are to:

- prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- aim to achieve at least good status for all water bodies by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status by 2021 or 2027;

- meet the requirements of Water Framework Directive Protected Areas;
- promote sustainable use of water as a natural resource;
- conserve habitats and species that depend directly on water;
- progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
- progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and,
- contribute to mitigating the effects of floods and droughts.

2.2. Ecological status

The ecological status of surface waters is classified using information on the biological (e.g. fish, benthic invertebrates, phytoplankton, angiosperms and macroalgae), physico-chemical (e.g. dissolved oxygen and dissolved inorganic nitrogen) and hydromorphological (e.g. hydrological regime) quality of the water body, as well as several specific pollutants (e.g. copper and zinc). Compliance with chemical status objectives is assessed in relation to environmental quality standards (EQS) for a specified list of 'priority' and 'priority hazardous' substances.

River Basin Management Plans (RBMPs) are a requirement of the WFD, setting out measures for each river basin district to maintain and improve quality in surface and groundwater water bodies where necessary. In 2009, the Environment Agency published the first cycle (2009 to 2015) of RBMPs for England and Wales, reporting the status and objectives of each individual water body. The Environment Agency subsequently published updated RBMPs for England as part of the second cycle (2015 to 2021), as well as providing water body classification results from 2015 to 2019 classifications via the Catchment Data Explorer (https://environment.data.gov.uk/catchment-planning).

The Proposed Development is located within the Thames Upper transitional water body (Figure 3.1) in the Thames river basin district which is reported in the Thames River Basin Management Plan (RBMP) (Environment Agency, 2015). The status of this water body is discussed further in Section 3.

Table 2.1: Definition of Status within the WFD Assessment

Status	
High	Near natural conditions. No restrictions on the beneficial uses of the water body. No impacts on amenity, wildlife, or fisheries.
Good	Slight change from natural conditions as a result of human activity. No restriction on the beneficial uses of the water body. No impact on amenity or fisheries. Protects all but the most sensitive wildlife.
Moderate	Moderate change from natural conditions as a result of human activity. Some restriction on the beneficial uses of the water body. No impact on amenity. Some impact on wildlife and fisheries.
Poor	Major change from natural conditions as a result of human activity. Some restrictions on the beneficial uses of the water body. Some impact on amenity. Moderate impact on wildlife and fisheries.
Bad	Severe change from natural conditions as a result of human activity. Significant restriction on the beneficial uses of the water body. Major impact on amenity. Major impact on wildlife and fisheries with many species not present.

The WFD aim is for all waterbodies to be at good status. The purpose of the WFD assessment is to assess whether the Hammersmith Temporary Ferry project will:

- cause or contribute to deterioration of status; or,
- jeopardise the water body achieving good status.

2.3. WFD Methodology

Dredging and disposal activities in estuaries have the potential to either cause deterioration in the ecological or chemical status of a water body, or to compromise improvements which might otherwise lead to a water body meeting its WFD objectives. The Environment Agency's 'Clearing the Waters for All' guidance[1] sets out the process for ensuring that the effects of dredging and disposal operations are compliant with the WFD. The guidance comprises three stages:

- Stage one: Screening;
- Stage two: Scoping;
- Stage three: Impact Assessment; and,
- Stage four: Identification of Measures.

The guidance methodology states that the purpose of the screening stage is to identify if further assessment of the activity is required. If the activity is considered low risk then no further action need be taken.

By referring to the Environment Agency's 'Clearing the Waters for All' guidance and the Thames RBMP (2015) and its supporting Annexes, this assessment considers the effects of the proposed Hammersmith Temporary Ferry upon WFD status.

2.4. Stage one: Screening

Within the screening stage, some activities can be 'screened out' due to the nature, frequency or intensity of the activity. This thereby excludes activities that do not need to go through the scoping, impact assessment and measures stages.

The Environment Agency's guidance states that: *you do not need to carry out scoping if your activity is low risk*. *Your activity is low risk if it is a 'self-service marine licence activity' or an 'accelerated marine licence activity' that meets specific conditions* (https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters).

If the Proposed Development does not meet the self-service or accelerated marine licence criteria, the assessment should proceed to stage two: Scoping.

2.5. Stage two: Scoping

If an activity is not screened-out during stage one, the scoping stage identifies any activities that have a potential risk/s to each of the five WFD receptors. The receptors are:

- Hydromorphology;
- biology – habitats;

[1] https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters

- biology – fish;
- water quality; and,
- protected areas.

These receptors are based on the water body's quality elements. Consideration is also required for invasive non-native species (INNS) at the scoping stage.

2.6. Stage three and four: Assessment and identification of measures

If there are any activities scoped in at stage two (above), the assessment stage considers the potential impacts of the activity, identifies ways to avoid or minimise impacts, and shows if the activity may cause deterioration or jeopardise the water body achieving good status.

2.7. Available data

No site survey has been carried out specifically for the WFD assessment, however, information from other sources has been used within parts of this assessment report. The assessment has been informed by the following data and reports:

- EA Catchment Data Explorer, which contains the current WFD results (Cycle 2: 2015-2021) [Last accessed: May 2021];
- Thames River Basin Management Plan (Environment Agency, 2016);
- Environment Agency – Migratory and freshwater fish monitoring surveys (EA, 2021);
- Various Thames guidance documents produced by, or for the Zoological Society of London (ZSL) HR Wallingford 2016; ZSL, 2016 and ZSL, 2018);
- Hammersmith Temporary Ferry: Hydrodynamic and scour assessment (HR Wallingford, 2021a);
- Hammersmith temporary Ferry: Underwater Noise Assessment (HR Wallingford, 2021b); and,
- Hammersmith Temporary Ferry: Aquatic Desk Study (HR Wallingford, 2021c).

2.8. Consultations

A number of consultations have been completed during the early stages of the Hammersmith Temporary Ferry project. With regard to WFD, this has included the following consultations:

- Environment Agency (08 April 2021) – First call with EA to discuss project, to outline the requirement for aquatic assessment and a Water Framework Directive (WFD) Assessment and noted the protected nature of the foreshore. Also notes requirement to consider scour.
- Marine Management Organisation – First call with MMO, to discuss project, to outline the requirement for aquatic assessment and a Water Framework Directive Assessment (WFDa) and to include consideration of scour and underwater noise.
- Environment Agency (22 April 2021) – Second meeting to discuss the projects. Within this meeting the EA confirmed the foreshore was not a protected mudflat as described under the WFD.

3. Identification of potentially affected water bodies

The Hammersmith Temporary Ferry project will be carried out within the Thames Upper transitional water body. Further information on the status of this water body is provided in Table 3.1.

There is not considered to be a mechanism for Hammersmith Temporary Ferry project to affect any other water bodies. The WFD Assessment has, therefore, been carried out in respect of the Thames Upper transitional water body.

3.1. Current status: Thames Upper transitional water body

Table 3.1 provides a summary of the Thames Upper transitional water body (GB530603911403), within which the Hammersmith Temporary Ferry project is located (see Figure 3.1). Details include current water body status (overall, ecological and chemical) and parameters currently failing to achieve good status.

Table 3.1: Thames Upper transitional water body summary

WFD water body name	Thames Upper
WFD water body ID	GB530603911403
River basin district name	Thames
Water body type	Estuarine
Water body total area (ha)	314.92
Overall water body status	Moderate
Ecological status	Moderate
Chemical status	Fail
Target water body status	Reaching good ecological potential (GEP) by 2027
Hydro-morphology status	Not assessed
Parameters not at Good Status (2019)	Biological: Supporting elements (subsurface water) and specific pollutants (Zinc); Chemical: Cypermethrin, Polybrominated diphenyl ethers (PBDE), Benzo(b)fluoranthene, Benzo(g-h-i)perylene, Benzo(k)fluoranthene, Mercury and Its Compounds and Tributyltin Compounds.
Is the water body heavily modified (HMWB)?	Yes
Use: Coastal protection	Yes
Use: flood protection	Yes
Use: navigation, ports and harbours	No
high-sensitivity habitat	none
Intertidal soft sediment (ha) (low sensitivity habitat)	36.28
Magic map link for each water body	Thames Upper
Bivalve mollusc production area name	none

WFD water body name	Thames Upper
WFD phyto-plankton classification	Good
History of harmful algae	Not monitored

Source: Water body summary table – EA.gov.uk and EA Catchment data explorer at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB530603911403 [Accessed April 2021]

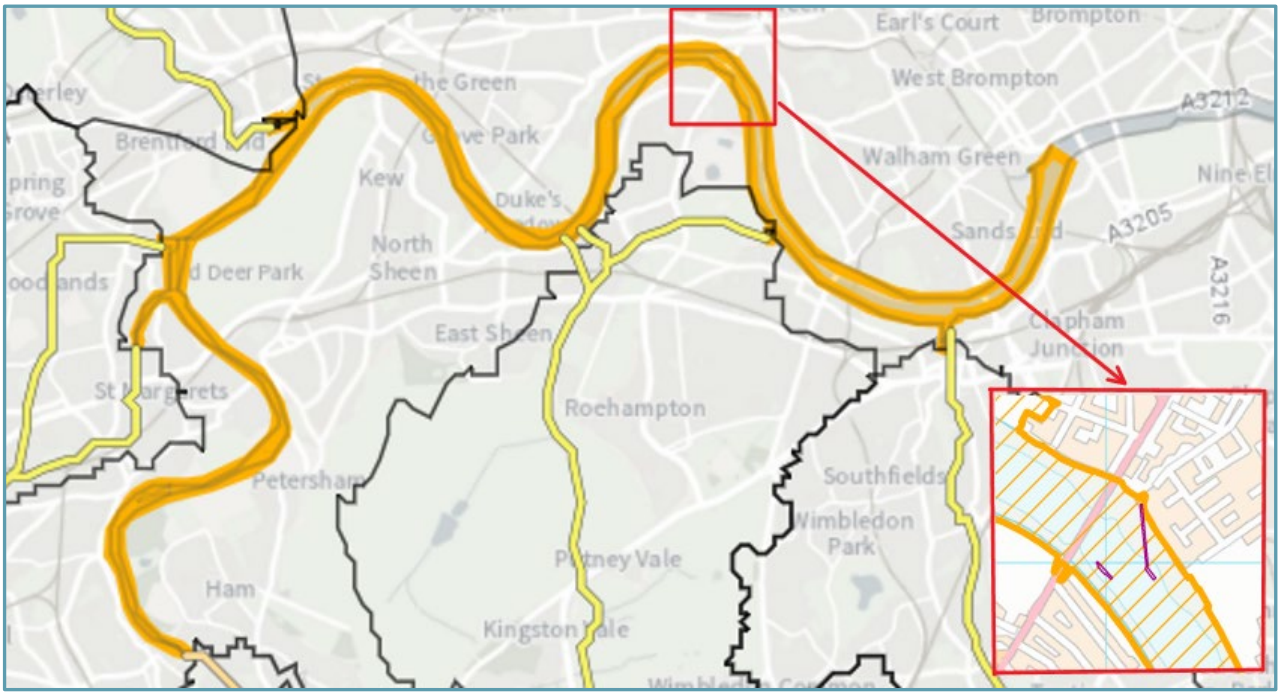

Figure 3.1: The Thames Upper transitional water body and location (red box) of the Hammersmith Bridge and the Temporary Ferry main structures (purple)

Source: Main map from EA Catchment Data Explorer

3.2. WFD protected habitats

Location of habitats protected under the WFD are indicated on Figure 3.2. The highlighted area on north bank, west of the Hammersmith Bridge is indicated as the protected habitat of intertidal soft sediment, which is either sand, mud or mixed (EUNIS A2.2, A2.3 or A2.4). The foreshore to the east of the Hammersmith Bridge where the structures for the Temporary Hammersmith Ferry are proposed, are not designated under the WFD. This is likely, in part, due to the more gravelly substrate present at that location.

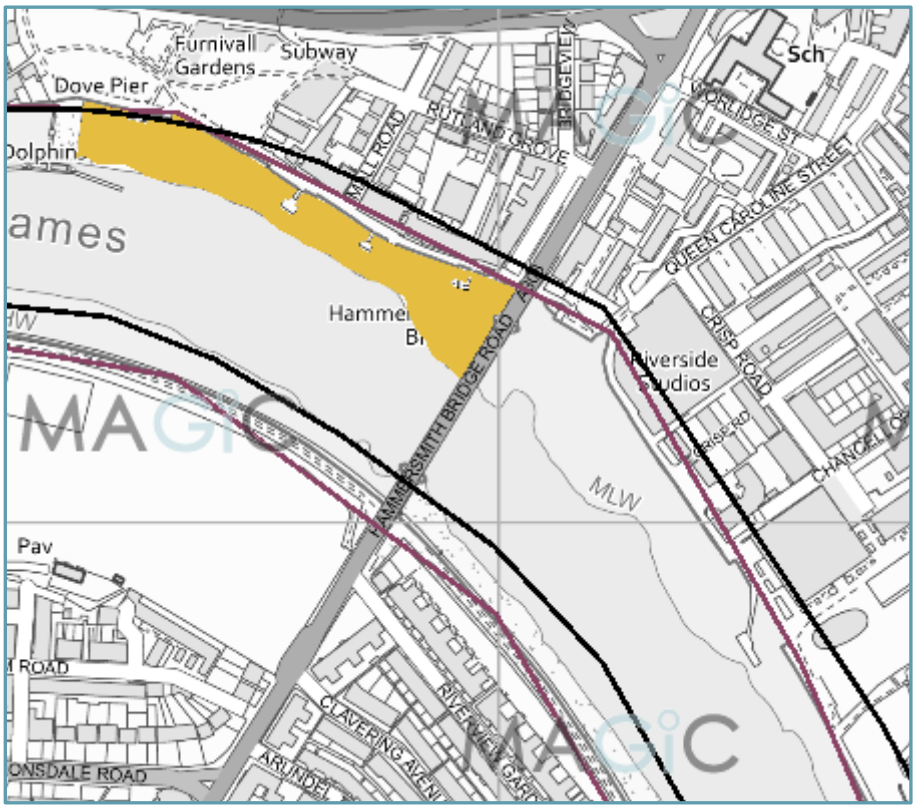

Figure 3.2: Location of WFD protected habitats. Highlighted area (north bank west of Hammersmith Bridge) is Intertidal Soft Sediment

Source: https://magic.defra.gov.uk/MagicMap.aspx

3.3. Thames RBMP

The Thames RBMP was produced by the EA to "…provide a framework for protecting and enhancing the benefits provided by the water environment." (Thames RBMP, 2016), which is aligned with the requirements of the WFD and contributes to objectives of other EU directives.

Each of the water bodies within the Thames river basin district have been given status objectives, which takes into account the requirement to prevent deterioration. The RBMP summarises the status objectives for all water bodies within the Thames River Basin District, along with the year in which it is aiming to be achieved.

Protected areas are also given objectives to protect the protected environment from adverse effects. The RBMP covers the entire Thames catchment, however only objectives for the Thames Upper water body are considered in this assessment. The RBMP assigns objectives for each water body, identifying the status and the year in which it is aiming to be achieved. See Table 3.1 of this report for the full list of status objectives for the Thames Upper water body.

The RBMP also sets out the existing plans for the different operational catchments to achieve by 2021, as well as future aims. The RBMP states that the priority river basin management issues to be tackled in the Tidal Thames catchment are:

- the water (including habitat enhancement, water quality, and flood risk);

- the human element (education, access, and public awareness); and,
- planning and economic development (including river traffic, commerce, fishing, and riverside development).

4. Water Framework Directive Assessment

4.1. Stage One: Screening

The first stage of a WFD assessment allows activities that do not require further assessment to be screened out. The Proposed Development does not meet the MMO criteria for 'low risk' activities.

As such, it is considered that the Proposed Development would need to progress to the WFD scoping stage.

4.2. Stage Two: Scoping

As the Proposed Development has not been screened out at stage one, consideration is required for the interaction of the Proposed Development with WFD receptors. A list of WFD receptors groups is shown in Section 2.5.

Environment Agency WFD guidance (2017) recommends the use of a scoping template to record the scoping stage findings (https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters) for estuarine and coastal waters. The template can then be sent to the regulator as part of the WFD assessment. The populated scoping template for the Hammersmith Temporary Ferry can be found at Appendix A. A summary of the scoping stage for the Thames Upper transitional water body is shown in the Table 4.1 below.

Table 4.1: Summery of WFD Scoping assessment

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	Yes	The Hammersmith Temporary Ferry includes: (i) plough dredging; (ii) installation of temporary piles; (iii) installation of 2 x temporary piers; and, (iv) a walkway (Hammersmith side) which will rest on foreshore at low tide. Each of these has the potential to impact the hydromorphology of the Thames Upper.
Biology: habitats	No	Location of the Hammersmith Temporary Ferry and size of works is below all risk thresholds.
Biology: fish	Yes	The Thames Upper is considered to be an important breeding and nursery area for smelt (*Osmerus eperlanus*) and a migratory route for European eel (*Anguilla anguilla*). The Hammersmith Temporary Ferry includes piling activity that has the potential to produce noise within the Thames Upper

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
		The project also includes plough dredging that may resuspend sediments that contain contaminants above CAL1.
Water quality	Yes	There may be sediment that will be disturbed during plough dredging or during pile installation that contain chemicals that are on the EQSD list and that may be above Cefas Action Level 1.
Protected areas	No	The only WFD protected area is a Nitrate Vulnerable Zone (Zone No. 455), however the proposed works does not involve any use of nitrogen fertiliser, store organic manure or involve agricultural sources of pollution and therefore, the proposed works will not impact Nitrate Vulnerable Zone 455 and is scoped out.
Invasive non-native species	Yes	Potential that INNS could be spread through the piling machinery or vessel used for the construction activities and the ferries that will be used for the ferry service

Source: Full WFD scoping assessment can be seen in Appendix A

4.2.1. Protected areas

The only WFD protected area is a Nitrate Vulnerable Zone (Zone No. 455), however the proposed works does not involve any use of nitrogen fertiliser, store organic manure or involve agricultural sources of pollution and therefore, the proposed works will not impact Nitrate Vulnerable Zone 455 and is scoped out..

Other protected areas, although not considered as protected within a WFD assessment (ie they are not SAC, SPA, bathing waters or shellfish waters), are shown on Figure 4.1. Further details of these sites are provided in the accompanying aquatic desk study (HR Wallingford 2021c) which includes assessment of potential impact on these sites.

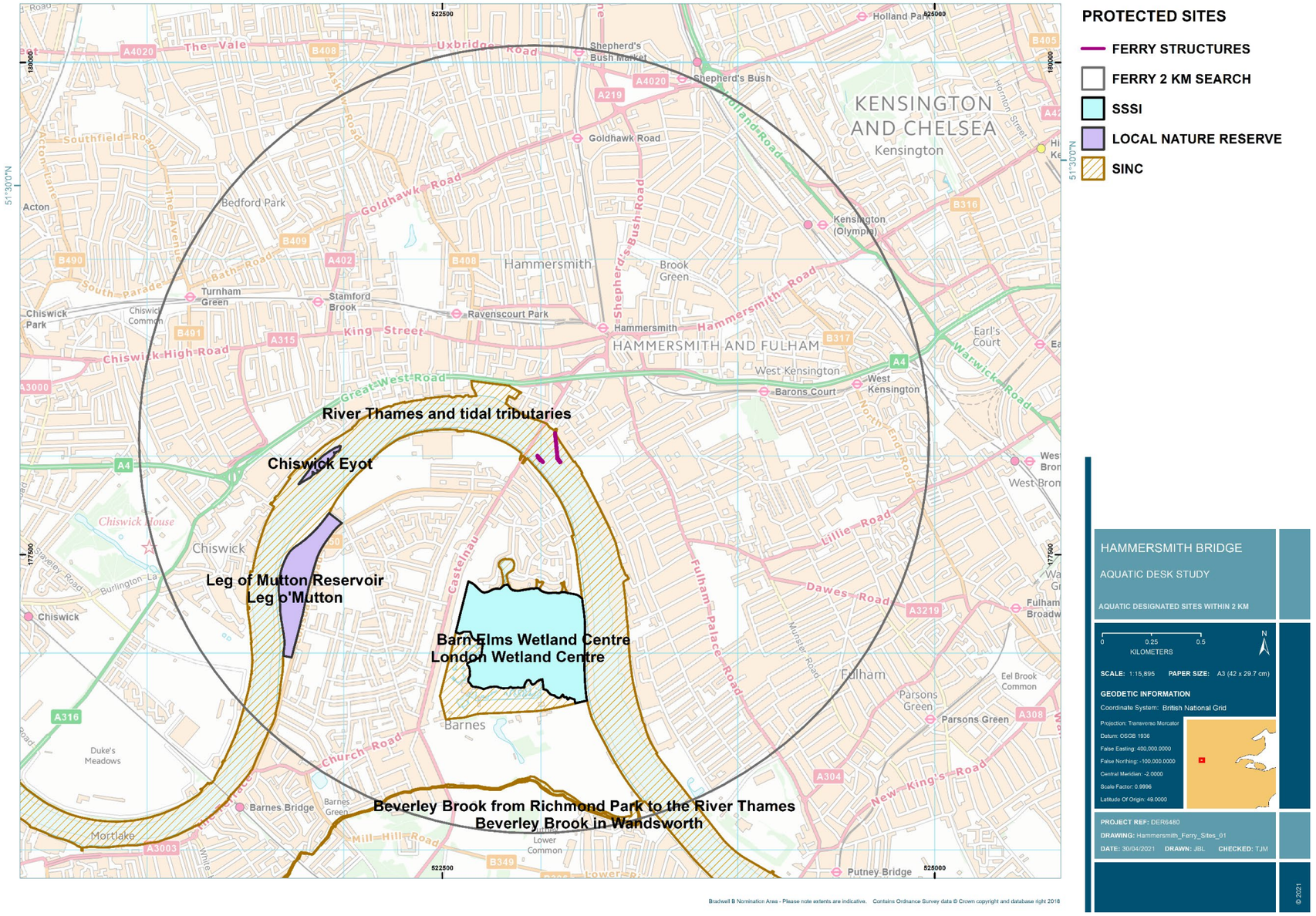

Figure 4.1: Designates sites within 2 km of the Hammersmith Temporary Ferry project

Source: Designated sites polygons from GiGL data search (GiGL, 2021) under licence to HR Wallingford [22 April 2021]. Copyright GiGL

5. Assessment of potential effects on identified receptors

5.1. Introduction

This section completes the Stage 3 WFD assessment of the potential effects the Hammersmith Temporary Ferry may have on receptors identified at the scoping stage (Table 4.1).

5.2. Hydromorphology

Introduction

The Hammersmith Temporary Ferry includes:

(i) plough dredging;

(ii) installation of piles;

(iii) installation of 2 x piers; and,

(iv) a walkway (Hammersmith side) which will rest on foreshore at low tide.

Each of these has the potential to impact the hydromorphology of the Thames Upper.

Hydrodynamic modelling suggests that the bridge piers will cause minor alterations in flow and a small increase in scour (HR Wallingford, 2021a). The changes are isolated over a minimal area of the river. The conclusions of the report were:

5.2.1. Flow alignment

There is no discernible change in the current direction as indicated by the vectors for the proposed case (HR Wallingford, 2021a).

5.2.2. Impact on hydrodynamics

Flow speed differences between baseline and proposed conditions are for the most part manifest as speed reduction due to the drag associated with the piles and blockage due to the piers, which the model (presented in HR Wallingford, 2021a) predicts will cause flow speed decreases locally up to 0.2 m/s but generally less than 0.1 m/s. For the later ebb case, there are small areas of flow speed increase, very locally up to 0.2 m/s at the up and downstream ends of the piers, associated with the reduced water depth caused by the draughts of the floating piers. There is also a small footprint of flow speed increase less than 0.1 m/s on the foreshore at Barnes Temporary Pier apparent for the later ebb case but not for either of the peak flow cases.

A number of locations in and around the Hammersmith Temporary Ferry were considered and predicted changes to hydrodynamics modelled. These are summarised below:

- At the Hammersmith bridge pier on the Barnes Temporary Pier side shows a very small decrease in peak flood tide flows, demonstrating a negligible effect on this third-party structure.

- Two locations one up and one downstream of the Barnes Temporary Pier show the effect of the piles and pier to reduce the flow speeds in the lee of the structure, but again below any significant magnitude of changes.
- The foreshore at Barnes shows a slight speed increase as flow is diverted around the pier structure, with the effect more pronounced on the later ebb tide.
- Underneath the floating walkway on the upper foreshore shows the effect of the reduced water depth underneath the temporary pier sections around peak flood tide, with no other changes apparent.
- At the outfall discharge site shows there is no effect of the structure at this location.

These changes are within the natural variability in currents that occurs in the area due to changes in tide and river flow and will not significantly impact on the main navigation channel. Additionally, there is no discernible impact of the Hammersmith Temporary Pier on the nearby outfalls.

5.2.3. Impact on morphology

The model results presented in HR Wallingford (2021a) indicate that the impact on morphology may include:

- Small patches of increased maximum grain size from 5 to 10 mm related to slight increases in the maximum bed shear stress underneath the temporary piers, indicating that in these very localised areas some bed material coarsening possibly leading to a small amount of erosion may occur.
- A small area of increase in maximum grain size to 5 to 10 mm on the Barnes foreshore suggesting some coarsening the sediment in this area - removing some of the finer fraction material, if present.

5.2.4. Impact of scour

Local scour may occur around the proposed piles at the Hammersmith and Barnes Temporary Pier, and the piles restraining the floating walkway, to depths no deeper than 1 m, but more than likely restricted to less than 0.5 m.

The risk of local scour occurring of the grounded floating walkway is considered to be low. Any scour that does occur during flooding and draining is expected to be within the bounds of natural variability.

Consideration has been given to the potential flow speed increases at the Hammersmith Temporary Pier piles during a outfall discharge event. The results show that there is limited increased risk of scour due to the proximity to the outfall.

5.2.5. Impact of plough dredging

There is the potential for small alterations to bed morphology due to the proposed plough dredging. Approximately 120 m^3 of sediment to be levelled by plough dredging in and around the area of the Hammersmith Pier to allow vessels to come alongside at low tide. The location of the sediment to be levelled in relation to the Hammersmith Pier is shown in Figure 1.5. The maximum height to be levelled at any location is circa 450 mm. The c.120 m^3 of sediment will be plough dredged downstream into an area which is currently lower in bed level.

There is likely to be some minor alterations to the dynamics which will be very localised as a result of the proposed dredging.

5.2.6. Hydromorphology conclusion

The change predicted to hydrodynamics as a result of both pier structures, associated walkway (Hammersmith) and minor amount of plough dredging are likely to result in minor localised effects, which are unlikely to affect a wide area of the river.

After the Hammersmith Temporary Ferry structures are decommissioned in between 3 to 5 years, the river morphology is likely to recover to pre-project conditions within a relatively small amount of time.

Overall, in the context of the scale of the Thames Upper WFD water body, any effects of the Hammersmith Temporary Ferry are considered to be negligible. Consequently, it is concluded that during construction and operation there are not expected to be any non-temporary effects on hydromorphology for the water body and the Hammersmith Temporary Ferry would not prevent the water body from meeting the WFD objectives for hydromorphology.

5.3. Migratory fish

Introduction

The Hammersmith Temporary Ferry includes piling activity that has the potential to produce noise within the Thames Upper WFD water body. The project also includes plough dredging that may resuspend sediments that contain contaminants above CAL1.

Of the fish species that are present within this stretch of the Thames, European smelt and the European eel are of conservation importance. This is because the Thames smelt population are known to spawn close to the project area and eel are known to pass by the area on their upstream and downstream migration. Some of the most frequented eel locations are upstream of the project area. These two species are considered in more detail in the sections below.

5.3.1. European smelt (*Osmerus eperlanus*)

The European smelt (*Osmerus eperlanus*) is a small predatory fish that inhabits cold-water estuaries including the Tidal Thames. Once common in the UK, it has suffered significant declines since the early 19th century due to water pollution, over exploitation and destructive river engineering. Improvements to water quality in the latter half of the 20th century have allowed smelt to return to 36 water courses in England including the Tidal Thames.

The presence of smelt in an estuary can be used as an indicator of good water quality due to their sensitivity to pollution. They are listed as a London and UK Biodiversity Action Plan species, as a Feature of Conservation Importance (FOCI) species for the Marine Conservation Zone process and as a Natural Environment and Rural Communities (NERC) Species of Principal Importance.

A report, completed by HR Wallingford on behalf of ZSL, identified the likely spawning location of smelt within the Thames. The report noted the timing of smelt spawning within the two years of study was:

- 2015 analysis suggests a potential spawning date of 19 March 2015 and hatching date of 2 April 2015.
- 2016 analysis suggests that spawning occurred from 1 March to 2 April 2016 and hatching occurred from 22 March to 13 April 2016.

The data indicate that smelt spawn over an elongated period of five weeks during March and the beginning of April, with a one to three week peak spawning period within that window. The specific timing and length of

the smelt spawning period each year is likely to be dependent on a range of environmental factors. Water temperature, tidal state, freshwater flow and salinity and lunar phase. Following spawning, juvenile smelt drift with the currents until they are large enough to swim independently. They remain in the Tidal Thames throughout the summer (ZSL, 2016).

During the ZSL ichthyoplankton surveys at Wandsworth Bridge, juvenile smelt estimated to be less than one day old were caught in 2015 and 2016. This suggested that the Wandsworth Bridge sampling site was in close proximity to where smelt spawned. HR Wallingford completed detailed numerical modelling of ZSL's ichthyoplankton survey dataset and their analysis showed a close match between the model results and the survey data when simulated smelt hatchlings were released at Wandsworth Bridge. The results suggest that smelt spawn in the area between Wandsworth Bridge and 600 m upstream of this point (see Figure 5.1). However, it cannot be ruled out that the spawning area could extend further West to Barnes Bridge (also shown in Figure 5.1). Full results can be found in the HR Wallingford 2016 report.

ZSL advise that no development affecting the subtidal habitat of the predicted spawning ground should be permitted during the months where smelt are likely to spawn: late February, March and April.

Figure 5.1: Location of predicted smelt spawning ground. Pink shows the most likely spawning ground and dark blue shows potential extension of this spawning ground upstream

Source: HR Wallingford, 2016

5.3.2. Impact of underwater noise on smelt

Although the Hammersmith Temporary Ferry is located in the area that is identified as potential extension area of the smelt spawning ground (indicated in blue of Figure 5.1), the project works are outside of the

spawning time of Feb- April. As such there is unlikely to be an impact on smelt spawning as a result of the project.

There is the potential for juvenile and or some adult smelt to be present at the Hammersmith Temporary Ferry site during the installation of piles that are required for the ferry structures. Piles are to be installed via vibratory piling methods, with a number of the piles being installed in the dry. An assessment of noise has is provided as a supplementary report (HR Wallingford, 2021b). The conclusions of this study are:

- Underwater sound levels generated during construction of the floating pontoon are unlikely to exceed TTS thresholds for marine mammals or fish;
- For fish eggs and larvae, the risk of TTS or damage is expected to be low.

As a result it is unlikely the piling required for the Hammersmith Temporary Ferry will have a significant effect on the smelt of the Upper Thames transitional water body.

5.3.3. European Eel

The European eel, *Anguilla anguilla*, has been listed as 'Critically Endangered' on the IUCN Red List since 2008 due to dramatic declines in abundance recorded across all stages of its life cycle and much of its natural range (IUCN, 2014).

Eels are protected under the EU Eels Regulation, 2009, which sets out an escapement target (migration from inland waters to the sea) of 40 % for silver eels. The Thames river basin district (RBD) currently has an average of 20 % silver eel escapement and as such does not meet the 40 % compliance target for Eel Management Plans 2015 (Defra, 2015).

ZSL has conducted regular monitoring surveys of eel within the Thames tributaries. They record the annual mean catch per unit effort (CPUE) between 2011 and 2018. Each of the sites ZSL survey in are shown in Table 5.1 for each site is shown in Figure 5.2 below. CPUE fluctuates between years across most sites and shows high variance from the mean within a single season. Of sites monitored, those that are upstream of the project site are highlighted in blue. As eels migrate, the sites indicated in blue must have eels that have passed the site during upstream migration as adults and that pass downstream as juvenile eels. Of note Brent-Stoney Sluice has recorded the highest CPUE for five consecutive years. Brent-Stoney sluice is approximately 7 km upstream of the Hammersmith Bridge. Figure 5.2 shows the location of each of the monitoring sites.

Table 5.1: Annual CPUE for each of the monitoring sites

Site	2011	2012	2013	2014	2015	2016	2017	2018
Ash-Colne Off Take	-	-	-	0.27	0.1	0.1	-	-
Brent-Stoney Sluice	-	-	15.3	244.31	114.63	88.94	210.29	507.46
Crane-Crane Park Island	0	0	0	-	-	-	-	-
Crane-Mogden STW	-	-	-	-	5.96	6.35	3.87	0.93
Cray-Hall Place	0	0.01	0.04	-	-	-	-	0.11
Darent-Acacia Weir	-	0.16	0.02	1.21	0.08	0.09	-	-
Ember-Island Barn Sluice	-	-	-	-	-	-	6.81	-
Hogsmill-Middle Mill	-	0.01	0.04	0.08	0.08	0.18	0.21	0.12
Lea-Bow Locks	-	0.09	1.48	2.98	0.61	0.88	-	-
Lea-Lea Bridge	-	-	-	-	-	56.57	132.95	98.925
Longford-Home Park	-	-	0.62	2.82	2.53	2.31	-	-
Medway-Allington Lock	-	10.9	133.3	66.68	2.34	0.48	1.49	0.76
Mole-Zenith Weir	-	1.25	0.09	0.1	0.52	-	-	-
Roding-Redbridge	-	0.08	0.47	7.2	2.36	0.83	1.15	3.61
Thames-Molesey Weir	-	0.82	14.63	2.1	1.68	1.63	0.82	0.67
Thames-Teddington Lock	-	-	-	0.36	0.02	0.25	0.31	0.50
Wandle-Merton Abbey Mills	0	0.97	0.64	2.46	0.5	1.41	11.34	0.79
Wandle-Morden Hall	-	-	-	-	-	-	2.43	1.64
Annual CPUE	**0**	**1.59**	**15.14**	**27.55**	**10.11**	**12.31**	**33.79**	**49.78**

Source: Table from ZSL, 2018

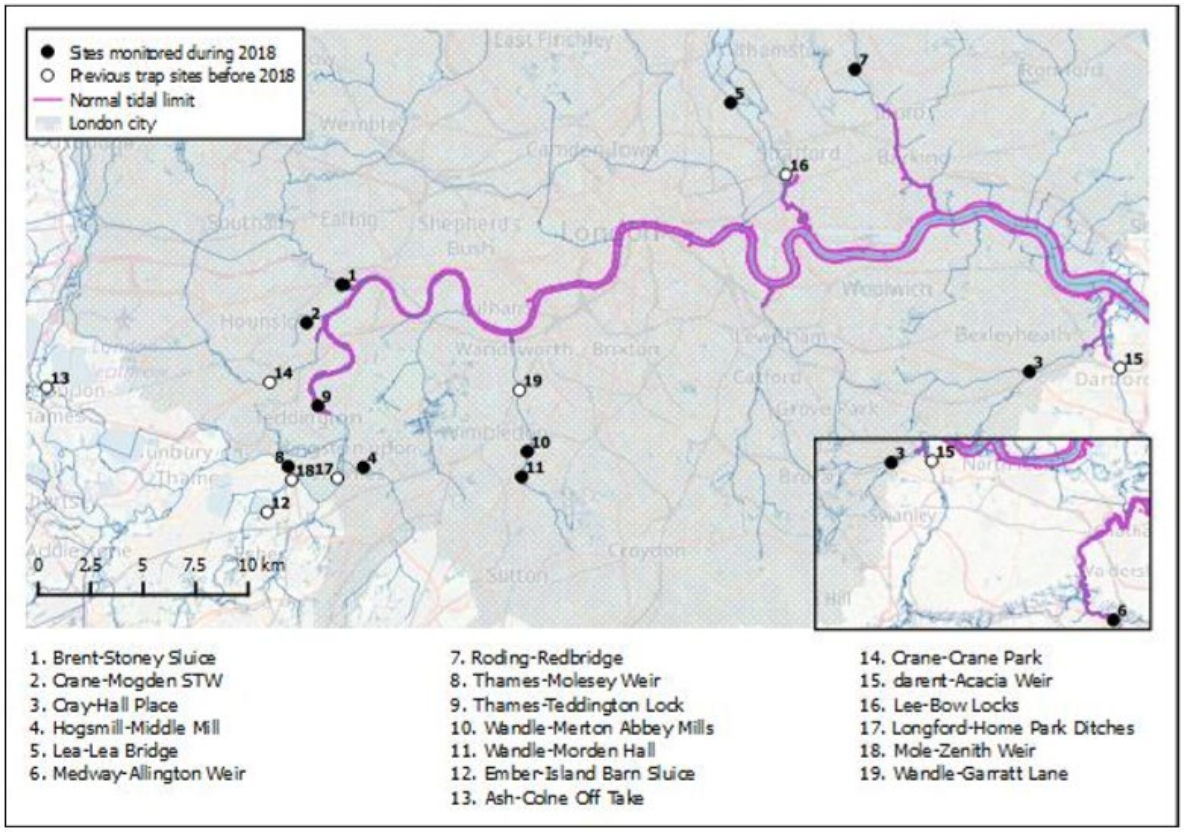

Figure 5.2: Location of the monitoring sites within the Thames catchment prior to 2018 and present. Map created using

Source: QGIS ©. (ZSL, 2018) Benthic Species (Benthos)

5.3.4. Impact of underwater noise on eel

Eel migration also generally occurs at night-time. As piling will be limited in night-time hours, the risk of noise impacts upon this activity is also low.

An assessment of noise has is provided as a supplementary report (HR Wallingford, 2021b). The conclusions of this study are:

- Underwater sound levels generated during construction of the floating pontoon are unlikely to exceed TTS thresholds for marine mammals or fish;
- For fish eggs and larvae, the risk of TTS or damage is expected to be low.

As a result it is unlikely the piling required for the Hammersmith Temporary Ferry will have a significant effect on the eel of the Upper Thames transitional water body.

5.3.5. Impact of sediment disturbance on migratory fish

Any piling activity into aquatic sediments is likely to disturb the sediment to some degree, depending on the nature of the piling activity and the nature of the sediments encountered.

The piling method proposed for the temporary ferry structures: piles will be driven by the crawler crane mounted on a spud leg barge. A jack-up barge will act as a piling gate where accessible. In the case of the 4 most northern piles, a landside excavator will act as the piling gate. Piles will be driven dry where possible, and in the minimum water level possible where not possible.

This is likely to cause some minor, localised disturbance to the sediment from the spud legs, the jack-up or by the land based excavator. This will be repeated each time the barge(s) is moved between each piling location. This is unlikely to significantly effect water quality as sediment disturbance will be minor.

The proposed plough dredging will likely move c.120 m^3 of sediment which will be ploughed downstream. Although there is typically some degree of chemical contamination in most tidal Thames sediments, it is unlikely that the disturbance of c. 120 m^3 of sediment would lead to anything other than potentially very minor impacts to water quality, which would be localised and short term. The likelihood of indirectly effect on migratory fish that may be present in the Thames Upper WFD water body is likely to be very low.

5.3.6. Migratory fish conclusion

The above assessments have concentrated on the two species with the highest conservation importance and generally high sensitivity. Overall, it is concluded that there are not expected to be any non-temporary effects on the fish quality element at water body level due to the Hammersmith Temporary Ferry and it would not prevent the Thames Upper water body from meeting the WFD objectives of good potential for fish.

5.4. Water Quality

Introduction

As the proposed works will impact the riverbed, sediments could be disturbed which could cause increased turbidity of the water, impact fish, and potentially release contaminated sediments. Priority substances and other polluting chemicals listed on the Environmental Quality Standard Directive (EQSD), and the Cefas Action Level 1 lists, such as heavy metals, organics and organo-metallic compounds, are present in the Thames Upper water body. The EA Water Quality Archive for Thames at Hammersmith Bridge (Dove Pier) has been monitoring and sampling such substances since 2000 at the site and recent data from early 2019 has recorded the presence of heavy metals and polyaromatic hydrocarbons (PAHs), amongst others.

5.4.1. Water quality of the Thames Upper

As seen in Table 3.2, one of the reasons for the water body not achieving 'good' status is due to tributyltin (TBT) being present in the water body bed sediments and contaminating them. TBT is a priority hazardous substance on the Cefas Action Level and EQSD lists. TBT was last sampled 0.2 m below the surface in March 2019 at the Dove Pier location, thus any disturbance of sediments near this site could cause TBT to become suspended in the water column.

Table 5.2: Water quality data from Thames at Hammersmith Bridge – Dove Pier (sampling point ID TH-PTTR0079) from 2019

Determinant	Average	Unit
4-nonPhenol	0.04	ug/l
As-Filtered	1	ug/l
B-[a]-pyrene	0.02081	ug/l

Determinant	Average	Unit
B-[b]-fluora	0.01969	ug/l
B-[ghi]-pery	0.02114	ug/l
B-[k]-fluora	0.01037	ug/l
C - Org Filt	5.23	mg/l
Cd Filtered	0.03	ug/l
CHLOROPHYLL	27.4	ug/l
Cr Hex Filt	0.3	ug/l
Cu Filtered	2.74	ug/l
Fe- Filt	100	ug/l
Fluoranthene	0.01595	ug/l
Hg Filtered	0.01	ug/l
Ind123pyrene	0.0214	ug/l
N Dis Inorg	10.64	mg/l
N Oxid Filt	10.56	mg/l
NH3 filt N	0.0865	mg/l
Ni- Filtered	2.697	ug/l
Nitrate Filt	10.52	mg/l
Nitrite Filt	0.047	mg/l
O Diss %sat	80.09	%
OrthophsFilt	0.69	mg/l
Oxygen Diss	8.185	mg/l
Pb Filtered	0.181	ug/l
ptOctylPheno	0.0014	ug/l
SiO2 Filt	9.89	mg/l
TriBT Cation	0.00038	ug/l
Turbdty in-s	75.84	ftu
Zn- Filtered	6.61	ug/l

Source: Environment Agency Water Quality Archive – available at: https://environment.data.gov.uk/water-quality/view/sampling-point/TH-PTTR0079 [Accessed May 2021].

5.4.2. Impact of sediment disturbance

Any piling activity into aquatic sediments is likely to disturb the sediment to some degree, depending on the nature of the piling activity and the nature of the sediments encountered.

The piling method proposed for the temporary ferry structures: piles will be driven by the crawler crane mounted on a spud leg barge. A jack-up barge will act as a piling gate where accessible. In the case of the 4 most northern piles, a landside excavator will act as the piling gate. Piles will be driven dry where possible, and in the minimum water level possible where not possible.

This is likely to cause some minor, localised disturbance to the sediment from the spud legs, the jack-up or by the land based excavator. This will be repeated each time the barge(s) is moved between each piling location. This is unlikely to significantly effect water quality as sediment disturbance will be minor.

The assessment of scour due to the placement of the temporary piles and the walkway structure that will bottom out during low tide to some degree, shows only minor disturbance of sediments. As such this is unlikely to significantly impact water quality or cause secondary effects on aquatic receptors.

The proposed plough dredging will likely move c.120 m^3 of sediment which will be ploughed downstream. Although there is typically some degree of chemical contamination in most tidal Thames sediments, it is unlikely that the disturbance of c. 120 m^3 of sediment would lead to anything other than potentially very minor impacts to water quality, which would be localised and short term.

Although there is typically some degree of chemical contamination in most Tidal Thames sediments, it is unlikely that the minor levels of disturbance to the sediments would significantly affect water quality. Where sediments are disturbed, the potential footprint for disturbance is small and is unlikely to significantly affect turbidity, dissolved oxygen, nutrient levels or levels of contaminants within the water.

The removal of the temporary piles and associated ferry structures after between 3 and 5 years will cause some disturbance to the sediment. Levels of disturbance are likely to be of a similar scale, nature and duration as during construction. The activity will also likely require some sort of jack-up barge to facilitate the removal, although the exact decommissioning method is not yet known.

Although there are usually at least some level of contamination in most Thames sediments, it is unlikely that the minor levels of disturbance to the sediments would significantly affect water quality.

The small additional scour due to the placement of piles in the Thames, will recover over time following their removal. During this time there is the potential for minor disturbance to the sediments.

Therefore, the impact of sediment disturbance on water quality due to constructions and decommissioning of the Hammersmith Temporary Ferry is likely to be negligible for water quality.

5.4.3. Impact of accidental pollution event

During construction, operation and decommissioning, a number of vessel will be required, from barges (during construction and decommissioning) to ferries during normal operation. As is the case for most operations that take place in and near the marine environment, there is the potential for accidental spillages or leakages of substances (e.g. fuels, oils, etc.) to occur from vessels, which has the potential to adversely affect water quality through direct input to the estuary or via runoff.

To minimise the risk of spillage or leakages from occurring, best practise techniques and due diligence should be implemented throughout all construction, operational and decommissioning activities. Thames Clipper will have an emergency response protocol, which will include what actions to take following an expected leak or spillage.

All working practices will adhere to the Guidance on Pollution Prevention (NetRegs, 2020) and all vessels would adhere to the requirements of the MARPOL Convention Regulations.

It is not possible to assess the significance of a particular pollution incident as this is dependent on the nature of the incident (e.g. location, scale, type of pollutant). However, the risk associated with the impact of accidental pollution events is considered low.

5.4.4. Water quality conclusions

Overall, it is considered that there are not expected to be any non-temporary effects on chemical status/potential at water body level and that the Hammersmith Temporary Ferry would not prevent the Thames Upper water body from meeting the WFD objectives of good/high for water chemistry.

5.5. Invasive non-native species

Introduction

Introduction and transfer of non-native species (NNS) can occur by the transport and discharge of ballast water, transport of fouling organisms on vessel hulls and via the installation of artificial structures (Nall, 2017).

Once NNS become established and disperse within a new habitat they can out-compete local species for space and resources, prey directly on local species, or introduce pathogens (Roy et al., 2012). Consequently, the introduction of NNS could potentially affect the ecological functioning of estuarine communities, however, it is important to understand that the majority of non-native species are not 'invasive' non-native species (INNS) (i.e. a non-native species that has the ability to spread causing damage to the environment, the economy and our health (GBNNSS 2021)).

5.5.1. INNS of the Thames Upper

The London Invasive Species Initiative, part of the London Biodiversity partnership, encourages better co-ordination and partnership working to prevent, reduce and eliminate the impacts caused by invasive non-native species across the city.

A list was provided during the GiGL (2021) data search of a 2 km radius form the project. The one species noted of concern was the crustacean, the Chinese Mitten Crab (*Eriocheir sinensis*). This species was recorded on 7 occurrences, between 09/09/11 and 10/10/16. These records are either from adjacent to Chiswick Eyot (LNR), or from the London Wetland Centre LNR site.

From Fulham Club ES Chapter (WSP, 2017), non-native species found in samples included the New Zealand mud snail (*Potamopyrgus antipodarum*), which has been widespread in British rivers for many years, and the Asian clam (Corbicula fluminea), which has become well established in the tidal Thames.

5.5.2. Impact of INNS

With any construction activity that requires plant and vessels from another location, there is the potential for the spread of non-native species to the project area. After the works are complete, there is also the potential for the spread of non-native species that are present at the project site to other locations.

A Construction Environmental Management Plan (CEMP) to be produced and all contractors should be made aware of the presence and identification of aquatic invasive species (such as via the ID sheets found on the Non-Native Species Secretariat).

With any operations of this nature, best practice should be adopted to prevent the spread of non- native species. All equipment, including boats and platforms, must be cleaned and inspected (check, clean, dry technique) for the presence of invasive species such as Chinese mitten crab or zebra mussel prior to being removed from site.

If these steps are taken, it is unlikely that invasive species will be spread by the proposed project.

5.5.3. INNS conclusion

Overall, with appropriate INNS mitigation measures in place as indicated above, it is considered that the risk of potential spread/introduction of INNS during construction, operation and decommissioning is not expected to have any non-temporary effects on the WFD potential of the Thames Lower water body and would not affect the attainment of WFD objectives.

5.6. Assessment against WFD Mitigation Measures

With respect to the WFD mitigation measures established by the Thames RBMP, as there are currently no mitigation measures in place for the Thames Upper water body, the proposed scheme will not impact on any measures.

5.7. Assessment against WFD Status Objectives – Improvement Assessment

The Hammersmith Temporary Ferry does not provide any opportunities for improvements in respect to the WFD objectives, however it will not jeopardise the water body status from improving.

5.8. Assessment against WFD Status Objectives – Deterioration Assessment

This assessment concludes that the Hammersmith Temporary Ferry proposed scheme is compliant with the requirements of the WFD and thus it can be stated that it will not cause or contribute to deterioration of the water body, nor jeopardise the water body status from improving..

6. Conclusion

The proposed Hammersmith Temporary Ferry is not expected to negatively impact the WFD status of the Thames Upper water body, nor jeopardise the water body status from improving.

The impacts discussed in this report, have the potential to lead to minor, localised or temporary effects, which are likely to recover once the ferry structures are removed after between 3 to 5 years. Potential impacts on hydromorphology, fish, water quality and invasive species will be mitigated during the construction and decommissioning of the project and therefore, the proposed works are unlikely to significantly impact the water body or its habitats and species.

Regarding the significance of risks to the water body, the temporary nature of the ferry structures means that it is not expected to cause a permanent change to the watercourse. Overall for the Hammersmith Temporary Ferry, it is concluded that there is no significant risk to the water body.

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Appendices

A. Water Framework Directive assessment – Scoping template

Project and site information

Activity	Description, notes or more information
Applicant name	Thames Clipper
Application reference number (where applicable)	
Name of activity	Hammersmith Temporary Ferry
Brief description of activity	To facilitate the refurbishment works and enable repairs for Hammersmith Bridge, a temporary ferry service is required to provide pedestrian and cycling access over the River Thames. The temporary ferry service, located to the east of Hammersmith Bridge, will provide access for pedestrians and cyclists to cross the River Thames. The temporary crossing as proposed is shown in the general arrangement drawing in Figure 1.1. Two new temporary piers are proposed as ferry terminals, Hammersmith Pier (Figure 1.2 and Figure 1.3) on the north bank and Barnes Pier (Figure 1.4) on the south bank. In terms of structural marine elements: ■ Barnes Pier comprises two new piles of around 1 m diameter restraining a peir of dimensions approximately 40 m long and 10 m wide. ■ Hammersmith Pier has a shorter pier and similar arrangement of two restraining piles, a floating walkway and a transition platform with two piles. The floating walkway comprises 11 restraining piles at 15 m intervals, and rests on the foreshore at low water.
Location of activity (central point XY coordinates or national grid reference)	Easting 523005 Northing 178055
Footprint of activity (ha)	Ca 007 ha / 7,000 m^2. This includes additional area for the jack-up barge during installation of piles.

Activity	Description, notes or more information
Timings of activity (including start and finish dates)	The construction activities are likely to last approximately 2 months and is likely to start in July 2021. The Temporary Ferry is likely to be operational for approximately 3 years. The ferry structures (pier, walkway and piles) will be removed at the end of the project.
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	The extent of the activity is fully within the Thames Upper transitional water body. The ca. 0.7 ha area includes area for jack-up barge during installation of piles and ferry structures. The actual area for the ferry structures when in-place for approximately 3 years is: Barnes walkway (not in contact with foreshore) XX m^2 Barnes Pier ca. 400 m^2 Hammersmith walkway (rests on foreshore at low tide) XX m^2 Hammersmith Pier ca XX m^2
Use or release of chemicals (state which ones)	Potential for release/resuspension of chemicals from the sediment during plough dredging, during pile installation and removal. Potential for accidental leakages and spills and during construction / decommissioning activities and during ferry service.

Water body	Description, notes or more information
WFD water body name	Thames Upper
Water body ID	GB530603911403
River basin district name	Thames
Water body type (estuarine or coastal)	Estuarine
Water body total area (ha)	314.92
Overall water body status (2019)	Moderate
Ecological status	Moderate
Chemical status	Fail

Water body	Description, notes or more information
Target water body status and deadline	Reaching good ecological potential (GEP) by 2027 Reaching good chemical status (GCS) by 2015 Reaching the protected area objectives by 2015
Hydromorphology status of water body	Not assessed
Heavily modified water body and for what use	Yes HMWB - for (1) Coastal protection; and (2) Flood protection.
Higher sensitivity habitats present	none
Lower sensitivity habitats present	Intertidal soft sediment – 36.28 ha;
Phytoplankton status	Good
History of harmful algae	Not monitored
WFD protected areas within 2km	Nitrate Vulnerable Zone - Beverley Brook (Motspur Park to Thames) and Pyl Brook at West Barnes NVZ (Zone ID 455) within 2 km of project. No other WFD Protected areas are within 2 km of the Temporary Ferry.

Source: Environment Agency's catchment data explorer and the water body summary table

Specific risk information

Consider the potential risks of your activity to each of these receptors:

- hydromorphology
- biology (habitats and fish)
- water quality
- protected areas.
- Invasive non-native species (INNS).

Section 1: Hydromorphology

Consider if hydromorphology is at risk from your activity.

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment is not required	Overall hydromorphology status of the Thames Upper is not assessed, and so unable to determine if the Thames Upper is of high status for hydromorphology.
Could significantly impact the hydromorphology of any water body	Impact assessment is required		The Proposed Development includes: (i) plough dredging; (ii) installation of piles; (iii) installation of 2 x piers; and, (iv) a walkway (Hammersmith side) which will rest on foreshore at low tide. Each of these has the potential to impact the hydromorphology of the Thames Upper
Is in a water body that is heavily modified for the same use as your activity		Impact assessment is not required	Thames Upper water body HMWB status for: (i) Coastal protection; and

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
			(ii) Flood protection. The Temporary Ferry does not include any coastal protection or flood protection activities.

Section 2: Biology

Consider if habitats are at risk from your activity.

Higher sensitivity habitats [2]	Lower sensitivity habitats [3]
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

Source: WFD Scoping template – available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/577892/wfd_scoping_template.odt

Note: [2] Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.

[3] Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5 km^2 or larger			Footprint of activity is less than 0.5 km^2.

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
		Impact assessment is not required for all sections	Actual footprint is 0.007 km^2 plus footprint including area for jack up barges.
1% or more of the water body's area			Total water body area: 314.92 ha Footprint is less than 1% of water body's area when area. Total footprint ca. 0.7 ha = 0.0023% of water body's area.
Within 500 m of any higher sensitivity habitat			There is no higher sensitivity habitat within the Thames Upper.
1% or more of any lower sensitivity habitat			The project footprint is not within a lower sensitivity habitat. The closest lower sensitivity habitat is the other side of the Hammersmith Bridge – approximately

Note: [4] Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions		Yes activity is within an estuary. The Thames Upper is considered to be an important breeding and nursery area for smelt (*Osmerus eperlanus*) and a migratory route for European eel (*Anguilla anguilla*).
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	An impact assessment is required.		The Hammersmith Temporary Ferry includes piling activity that has the potential to produce noise within the Thames Upper The project also includes plough dredging that may resuspend sediments that contain contaminants above CAL1.
Could cause entrainment or impingement of fish		Impact assessment not required	No risk of entrainment or impingement of fish.

Section 3: Water quality

Consider if water quality is at risk from your activity.

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)		Impact assessment is not required	The activities required for the Hammersmith Temporary Ferry will not continually affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns for longer than a spring neap tide cycle.
Is in a water body with a phytoplankton status of moderate, poor or bad		Impact assessment not required	Phytoplankton status is good.
Is in a water body with a history of harmful algae		Impact assessment not required	Harmful algae in the Thames Upper is not monitored.

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Impact assessment is required		There may be sediment that will be disturbed during plough dredging or during pile installation that contain chemicals that are on the EQSD list.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
It disturbs sediment with contaminants above Cefas Action Level 1	Impact assessment is required		There may be sediment that will be disturbed during plough dredging or during pile installation that contain chemicals that are above Cefas Action Level 1.

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list		Impact assessment not required	The activity does not have a pipeline or outfall.

Note: Carry out your impact assessment using the Environment Agency's surface water pollution risk assessment guidance, part of Environmental Permitting Regulations guidance

Section 4: WFD protected areas

Consider if WFD protected areas are at risk from your activity. These include:

- special areas of conservation (SAC)
- special protection areas (SPA)
- shellfish waters
- bathing waters
- nutrient sensitive areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2 km of any WFD protected area[6]		Does not require impact assessment	The Hammersmith Temporary Ferry project is: ■ not within 2 km of a special areas of conservation (SAC) ■ not within 2 km of a special protection areas (SPA) ■ not within 2 km of shellfish waters ■ not within 2 km of bathing waters ■ is within 2 km of a nutrient sensitive areas - • Nitrate Vulnerable Zone - Beverley Brook (Motspur Park to Thames) and Pyl Brook at West Barnes NVZ (Zone ID 455) • Although the Hammersmith Temporary Ferry is within 2 km of Nitrate Vulnerable Zone 455, the proposed works does not involve any use of nitrogen fertiliser, store organic manure or involve agricultural sources of pollution and therefore, the proposed works will not impact Nitrate Vulnerable Zone 455 and can be scoped out.

Note: [6] Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.

Section 5: Invasive non-native species (INNS)

Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- materials or equipment that have come from, had use in or travelled through other water bodies
- activities that help spread existing INNS, either within the immediate water body or other water bodies

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Potential that INNS could be spread through the piling machinery or vessel used for the construction activities and the ferries that will be used for the ferry service.

Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	Yes	The Hammersmith Temporary Ferry includes: (i) plough dredging; (ii) installation of piles; (iii) installation of 2 x piers; and, (iv) a walkway (Hammersmith side) which will rest on foreshore at low tide. Each of these has the potential to impact the hydromorphology of the Thames Upper.
Biology: habitats	No	Location of the Hammersmith Temporary Ferry and size of works is below all risk thresholds.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Biology: fish	Yes	The Thames Upper is considered to be an important breeding and nursery area for smelt (*Osmerus eperlanus*) and a migratory route for European eel (*Anguilla anguilla*). The Hammersmith Temporary Ferry includes piling activity that has the potential to produce noise within the Thames Upper The project also includes plough dredging that may resuspend sediments that contain contaminants above CAL1.
Water quality	Yes	There may be sediment that will be disturbed during plough dredging or during pile installation that contain chemicals that are on the EQSD list and that may be above Cefas Action Level 1.
Protected areas	No	The only WFD protected area is a Nitrate Vulnerable Zone (Zone No. 455), however the proposed works does not involve any use of nitrogen fertiliser, store organic manure or involve agricultural sources of pollution and therefore, the proposed works will not impact Nitrate Vulnerable Zone 455 and is scoped out.
Invasive non-native species	Yes	Potential that INNS could be spread through the piling machinery or vessel used for the construction activities and the ferries that will be used for the ferry service

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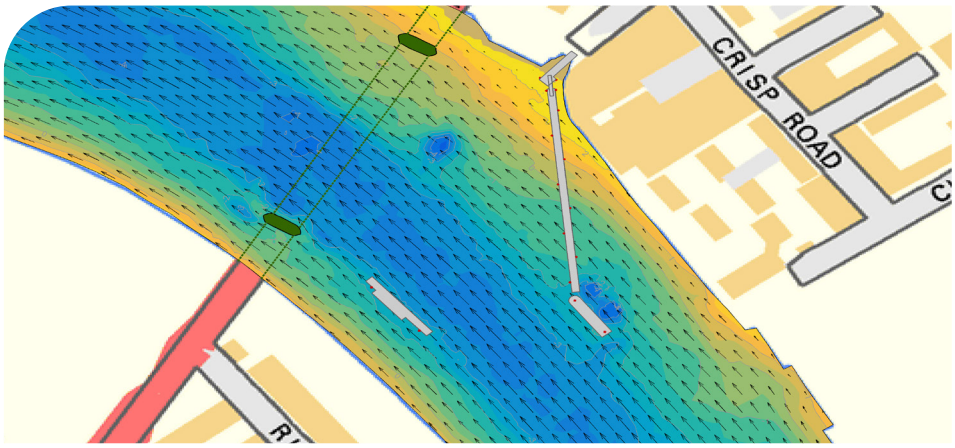

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