Mannings Heath Waste Water Treatment Works (WTW)

Construction Environmental Management Plan

10/10/23

Contents

Document history

Revision	Date	Purpose of Issue	Originator	Date	Checker	Date	Reviewer	Date	Approver
1	26/07/23	Planning application	J.Nicklin	10/10/23					

Where: Approver is Project Design Lead / Lead Design Engineer.

1 Introduction

1.1 General

This Construction Environmental Management Plan (CEMP) has been produced to accompany the planning application for the proposed development at Mannings Heath Water Treatment Works.

This document has been developed by Southern Water to avoid, minimise and mitigate any construction impacts on the environment and surrounding community. It will form the basis of the Principal Contractor's separate Environmental Management Systems (EMS) and associated plans and procedures. It brings together embedded mitigation measures with project-specific measures to minimise and manage the potential impacts during construction. It sets out the responsibilities with regards to compliance with legislation, permissions and consents obtained and implementation of mitigation measures. Where such permissions and consents have been obtained these are appended as appropriate.

The CEMP also provides a framework to guide mitigation measure implementation throughout the project. It is a dynamic document which will be reviewed if activities or conditions on-site change in a way that may influence these management measures.

For the purposes of this document, the working area is defined as any area where there will be a requirement for temporary or permanent works to facilitate the construction of the development. This includes areas required for access, temporary construction and temporary storage areas.

1.2 Purpose

The purpose of the CEMP is to:

- Identify stakeholder requirements;
- Set out the EMS requirements;
- Ensure compliance with current legislation;
- Effectively minimise any potential adverse environmental effects during construction including how site-specific method statements will be developed to avoid, minimise and mitigate construction effects on the environment; and
- Translate committed mitigation measures into actions which apply them on-site.

1.3 Structure

This CEMP has been drafted during the planning/design phase to ensure that the necessary measures are incorporated as the project progresses.

Embedded mitigation measures associated with the construction of the proposed development have been identified and are included within the appropriate section of this CEMP. The CEMP addresses environmental issues associated with:

- Stakeholder interface;
- Land management;
- Pollution prevention;

- Ecology and biodiversity;
- Archaeology and heritage;
- Dangerous substances;
- Air quality;
- Resource management; and
- Nuisance

1.4 Objectives

This CEMP has been developed to detail the environmental management practices and procedures to be followed during construction of the project, to ensure comprehensive and committed management measures are followed, protecting the environment.

2 Project description

2.1 Introduction

The Mannings Heath WTW project is driven by the Wastewater Framework (WFD_IMPG) driver to meet a phosphorus limit (P) of 0.5 mg/L (Annual Average) with an iron limit (Fe) of 4 mg/l (95%) and 8 mg/l upper tier. The regulatory date has been confirmed as 22/12/2024. Southern Water are proposing to pump 9.1l/s from Mannings Heath WTW to the gravity sewer network that discharges to Horsham New WTW removing the continuous discharge to the receiving water body (tributary of the River Arun).

The Mannings Heath solution includes the conversion of an existing structure at Mannings Heath WTW into a new pumping station within the WTW boundary and the construction of a 3.6km pipeline heading westwards discharging into the existing Horsham New sewer network before being conveyed to Horsham WTW for treatment and discharge. The current Flow to Full Treatment (FFT) consent of 7l/s will be also be increased to 9.1 l/s which will reduce storm spills at Mannings Heath WTW. The existing inlet screen that screens all incoming flows will be retained as will the storm tank and overflow. The pipeline will exit Mannings Heath WTW to the west and requires a steep sided riparian valley to be crossed through the provision of a 15m pipe bridge.

The pipe bridge will not benefit from Southern Water's Permitted Development (PD) Rights for 'development not above ground level required in connection with the provision, improvement, maintenance or repair of a sewer, outfall pipe, sludge main or associated apparatus' - under the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended) (GPDO 2015), Part 13, Class B (a). This CEMP is a supporting document to the pipe bridge planning application.

A temporary construction compound has already been established at National Grid reference X 519742, Y 128916 as part of the wider pipeline scheme and delivered using Southern Wasters PD rights under Schedule 2 Part 4 Class A of the GPDO 2015 for "the provision on land of buildings, moveable structures, works, plant or machinery required temporarily in connection with and for the duration of operations being or to be carried out on, in, under or over that land or on land adjoining that land". However the temporary access from the Brighton Road requires a retrospective planning application and as such this CEMP also includes these works.

2.2 Site location

Mannings Heath WTW is an existing operational wastewater treatment site located at National Grid Reference X 520292, Y 517383 and will be the starting point a cross country pipeline and the pipe bridge. The WTW is located to the north of Mannings Heath within the administrative boundaries of Horsham District Council and West Sussex County Council. The WTW is located at the end of an access road off Gaggle Wood as shown in Appendix A. The pipe bridge will start at approximate National Grid Reference X 520258, Y 129061 then head west for 15m before being connected to the below ground pipeline at X 520256, Y 129067.

2.3 Temporary construction compound

A temporary construction compound has been established adjacent to the Brighton Road and will be the primary compound facilitating the pipe bridge construction. A secondary laydown area will be established within the pipeline easement to the west of the proposed pipebridge.

Where needed topsoil and sub-soil will be removed to create the temporary construction compound which will be stored separately along the perimeter of the compound to avoid soil structure damage and facilitate reinstatement following construction. The compound will be accessed directly from the Brighton Road.

Following completion of the works all temporary areas will be fully reinstated to pre-commencement conditions and all temporary structures removed from site.

2.4 Overview of construction methods

The main construction activities and typical construction plant and equipment are as follows:

- Excavation, utilising large excavator, up to 39 tonne, tipper trucks for off-site removal/disposal of material;
- Trenching, utilising small excavator, roller, compactor/rammer and road saw;
- Tank construction, involving dewatering, rig shuttering pans/formwork, crane 30 tonne, concrete pump, concrete washout, large excavator – up to 39 tonne, tipper trucks for removal of material off-site/disposal; and
- Reprofiling of the land and installation of a concrete retaining wall and access road

2.5 Construction programme

The duration of the construction works is approximately 16 weeks, this period includes site mobilisation, commissioning and any repair and reinstatement works.

The standard construction working hours will be 07.30 to 18.00 Monday to Friday. There is no scheduled night working, weekend working or any working during Public Holidays. However, if due to unforeseen circumstances working during these hours is required, the Local Planning Authority will be notified.

3 Environmental policy and legislation

3.1 Introduction

The Principal Contractor (PC) will work with respect to their organisation's environmental and sustainability policies and will at a minimum adhere to Southern Water's Environmental Management Policy. At site, all visitors will comply with the Principal Contractor's site management, health, safety and environmental rules. The Principal Contractor's Environmental Policy(ies) will be posted on the Health, Safety and Environment notice boards within the site compounds, office and communal areas.

3.2 Policy, legislation and best practice guidelines

All mitigation and environmental control measures within the CEMP have been derived from the Environmental Screening Opinion, relevant best practice, policies and legislation relating to the specific technical area addressed. The mitigation and environmental control measures are the minimum measures that will be managed and implemented by the PC.

The PC must comply with all relevant legislation that is current at time of this CEMP and make updates to the CEMP and the site training and notice boards when any new environmental legislation comes into force.

The PC will be responsible for managing the site in keeping with any planning consent and conditions. The programme for delivery will include discharging pre-commencement planning conditions prior to works commencing.

In order to ensure compliance with the environmental requirements identified and to encourage continual improvement in environmental performance, the PC will develop and maintain an Environmental Policy as part of their EMS. The aims of this policy will be:

- To meet the requirements of all relevant environmental legislation, consents, agreements, planning permissions, authorisations and commitments;
- To ensure that all environmental undertakings and obligations of the PC are fulfilled;
- To adopt working methods that achieve good environmental practice on-site;
- To ensure that sub-contractors and suppliers are aware of the specific environmental constraints and opportunities of the site, and follow necessary procedures in order to ensure good environmental practice;
- To identify the responsibilities of staff and sub-contractors in achieving good environmental practice on-site;
- To mitigate against the effect of the construction works on residents, highway users and the general public; and
- The PC will be required to publicise a summary Environmental Policy statement to all site personnel and the general public.

3.3 Permits, consents and licences

Table 2 lists the permits, consents and licences that have been obtained and will be implemented by the PC during the construction phase. Specific measures and conditions relating to permits, consent and licences obtained are detailed throughout the CEMP.

Table 1: Permits, consents and licences obtained

Name	Description of works requiring consent	Consenting authority	Reference number	Copy of permit/ consent/ licence provided in Appendix
EIA Screening Opinion	All permitted development works including mobilisation of the construction compound adjacent to Brighton Road	West Sussex County Council	N/23a	EIA Screening Opinion

The following permits, consents and licences may be required and will be obtained and implemented during the construction phase. Table 3 lists some potential requirements but is not exhaustive.

Table 2: Permits consents and licences to be obtained

Name	Description of works requiring consent	Responsible Party for Obtaining Consent	Consenting authority
Town and Country Planning	Proposed above ground pipe bridge.	Client	West Sussex County Council
Materials Management Plan	Works involving excavated materials remaining on-site or being transferred to another user for reuse.	Contractor	Environment Agency
Waste permits and/or exemptions	Activities involving use, treatment, disposal or storage of waste (e.g. screening and blending of waste, aerosol crushing, composting, etc.).	Contractor	Environment Agency
Dewatering of excavations	Environmental Permit required for the movement and discharge of surface/ground water.	Contractor	Environment Agency
Sewer connection	Permission to connect and discharge to water utility foul sewer.	Contractor	Water Authority

4 Management of construction activities

4.1 Site roles and responsibilities

Southern Water Services Ltd. (SWS) will oversee the management of the proposed works as The Client. The PC will delegate site supervision roles such as the Environmental Clerk of Works (ECoW) and procure specialist environmental consultants to supervise, monitor or check the PC's Environmental Method Statements and sensitive activities prior to the commencement of works, as required.

This CEMP will form the basis of the PC's separate EMS and associated plans and procedures.

Overall implementation of the CEMP will be responsibility of the PC and their Site Manager. Environmental support and monitoring of construction activities will be supervised by the PC.

Table 4 identifies the overarching project responsibilities. The following roles have been designated to ensure that the delivery of the CEMP is effective and efficient in its role as a tool to minimise environmental impacts during the construction phase. Other key project roles will be defined by the PC and detailed within the PC's separate EMS.

Table 3: Roles and responsibilities

Designated role/ technical area	Responsibilities
SWS (Client)	• Responsible for ensuring any planning conditions are adhered to.
PC Site Manager	• Responsible for ensuring any planning conditions are adhered to by liaising with the Southern Water Project Manager and Environmental Manager regularly. • Overall responsibility on-site for the specific construction activities. Also, responsible for producing detailed CEMP and any subsequent updates. • Monitoring sub-contractors' compliance with the CEMP. • In the event of an environmental incident or emergency, the Site Manager will liaise with the Environmental Manager and inform Southern Water on construction activities and enforce any modifications to methods statements or stops to works required.
PC Health, Safety and Environmental Advisor	• Responsible for ensuring any planning conditions are adhered to. • Responsible for ensuring appropriate environmental monitoring is undertaken. • Liaison will be undertaken with the Site Manager in the event of an environmental incident to advise on actions to be taken.

4.2 Contact details and protocol incidents

In the event of an emergency the PC Site Manager will be contacted in the first instance. The PC will manage the emergency in accordance with their Emergency Preparedness and Response Plan and corresponding procedure. This will include contacting Southern Water and the statutory regulators where appropriate.

4.3 Information for contractors and visitors

All contractors and visitors to the site will be made aware of the Environmental Policy and the controls applicable to their presence and activities on-site, including but not limited to:

- Method statements;
- Risk assessments;
- Environmental briefings; and
- Toolbox talks.

The PC Site Manager will be responsible for monitoring communications between all relevant parties to the project ensuring that all environmental matters to the project are discussed and managed.

4.4 Site induction

All site personnel including sub-contractors will be made aware of their responsibilities under the CEMP, and its appropriate implementation. A site induction will be provided by the PC to all personnel at the start of each construction phase, and to each visitor on an as needed basis. This induction will be updated and refreshed when required. The induction will include the topics such as general health and safety (H&S) and environment, which are detailed below.

A bespoke site induction will be created by the PC covering the operations required by their construction activities. Personnel will be required to sign a record of their site induction and these will be kept on file.

The site induction will cover the following items as a minimum:

- Security;
- Site rules for contractors and sub-contractors;
- Manual handling;
- Working at height;
- Confined spaces;
- Site documentation;
- Smoking/housekeeping;
- Driving;
- Signage;
- Welfare;
- Emergency response and preparedness; and
- Key contact details.

The PC will be required to produce an H&S Site Management Policy for the site and an appropriate person must be appointed as H&S Manager who will be responsible for enforcing health and safety measures during construction phases. The H&S Site Management Policy will be reviewed and accepted by SWS before works commence.

In line with SWS procedures, all personnel and visitors to the site will be given H&S training as part of their site induction which will include specific measures appropriate to the site and the construction activity.

As part of the site induction, a specific section will be dedicated to the ecology of the site prepared by a competent environmental advisor. The aim of this is to make all personnel working on the site

fully aware of the ecological sensitivities of the site and surrounding habitats, and the restrictions imposed on working arrangements to safeguard protected species and habitats.

Site staff will be competent to perform tasks that have potential to cause environmental impact. Competence is defined in terms of appropriate education, training and experience. Where project specific training is required, training will be appropriate to the role and seniority of staff.

4.5 Working hours

Construction works will be kept to specified hours to reduce potential noise impacts on nearby residential receptors. These specified hours are:

- Monday to Friday 07:30 - 18:00.
- Saturday 07:30 - 13:00 (subject to agreement with the SWS Project Manager (PM) and Local Planning Authority)

Working at night will be avoided. Advance agreement will be sought prior to any works outside of these hours from the Local Planning Authority. There is no intention for work to be undertaken on Sundays or any Bank Holidays.

If there is any need to work out of these hours the PC will discuss this change with the Local Planning Authority at the earliest opportunity and at least one week prior to the works commencing.

4.6 Communication strategy

4.6.1 Internal communication

Site communication boards will be positioned within the site compound and in site welfare offices. These boards will display pertinent environmental information including, but not limited to, the Environmental Policy, emergency contact details, location of spill response equipment and environmental briefings.

Key activities and environmental sensitive operations will also be briefed to staff and subcontractors during daily site briefings.

A schedule of meetings will be developed to include regular Safety, Health and Environment meetings, where any issues or incidents will be raised for the attention of the client, along with proposed remedial action and additional control if required. An environmental register must be signed and updated to confirm issues and incidents, along with tool box talks, training and site briefings.

During the construction phase, internal communication will include reporting on the following: Inspections, audits and non-conformance, environmental performance data including any incidents, near misses and progress on reaching targets.

4.6.2 External communication

The PC will endeavour to minimise the effects on the adjoining properties, neighbours and the public as far as is practical, and will adopt a proactive approach to management of the key issues, such as:

- Communication with neighbours and stakeholders;

- Liaison with the Council's Environmental Health and Highways departments;
- Planning and management of vehicle routes for deliveries;
- Traffic management and pedestrian routes;
- Control of noise and vibration and fumes;
- Control of works to the site boundaries and interface with immediate neighbours; and
- Public transport routes and bus stops.

A number of procedures will be put in place to create and maintain lines of communication with neighbours and the local community including:

- Regular contact with the Council and Neighbours where required;
- A Stakeholder Manager will be appointed and their contact details publicised in advance of the works for direct correspondence;
- Letters to keep people abreast of the progress of the works;
- Periodic letter drops relating to exceptional activities;
- Feedback, complaints and positive response procedure.

4.7 Complaints and inquiries

Where construction activities result in a complaint being made to the site operatives, the customer contact will be reported to Southern Water Stakeholder Manager. Once recorded and reported the PC will liaise with the LPA in order to develop mitigation measures and discuss and address any residual issues once the actions have been implemented.

Careful monitoring of complaints received, including recording details of the location of the affected party, time of the disturbance and nature of the disturbance shall be undertaken to assist with managing the works to reduce the likelihood of further complaint.

Contact details for the Site office and Stakeholder Manager will be publicised in advance of the works using appropriate measures including site signage, notice boards or by letter. A detailed reporting procedure will be developed and implemented throughout the construction phase by the PC.

5 Environmental management, mitigation and monitoring

This section identifies the main environmental aspects that are to be managed during construction of the proposed development. The environmental aspects considered herein are as follows:

- Noise and vibration;
- Air quality;
- Biodiversity;
- Landscape and visual;
- Light pollution;
- Cultural heritage and archaeology;
- Soil / land use management;
- Resource management;
- Land contamination;
- Hazardous materials management;
- Transport management;
- Waste management; and
- Water management and flood risk.

5.1 Noise and vibration

Construction activity by its very nature can generate adverse noise and vibration impacts on receptors in close proximity to the development site. In particular, noise and vibration associated with construction plant and drilling equipment are likely to be potential sources for noise and vibration.

Vibration from construction works can be perceptible to people even when the vibrations are at a low magnitude. Damage to buildings and other structures tend to be caused when vibrations are at a high velocity but a low frequency.

The nearest residential receptors is located approximately 100m to the east of the new infrastructure.

Temporary noise sources will consist of the following:

- Site traffic during construction – heavy goods vehicles, Hiab (or similar truck-mounted loader crane), dumpers, cranes, general staff traffic.
- Excavation and backfilling of trenches.
- Off-loading of assets.

5.1.1 Control measures

As a minimum, mitigation follows the principles set out in BS 5228-1/2: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. The principles of Best Practicable Means will be employed to minimise noise levels during construction.

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Noise and vibration controls	• Limit construction activities to agreed working hours. • Notify and consult with all potentially affected parties that may be adversely affected from construction-site noise either via verbal face to face communications or letter drops. • Provide the local authority with advance notice of any works scheduled to take place outside agreed working hours. • Select inherently quiet plant, where appropriate. • Ensure all major compressors are 'sound reduced' models fitted with properly lined and sealed acoustic covers, where appropriate, that are kept closed whenever the machines are in use. • Ensure all ancillary pneumatic percussive tools are fitted with mufflers or silencers of the type recommended by the manufacturers. • Position ancillary plant (e.g. crushers, screeners, generators, compressors, pumps) to reduce noise disturbance, i.e. furthest from receptors or behind noise barriers. • Ensure subcontractors properly maintain and operate all plant according to manufacturer's recommendations so as to avoid causing excessive noise. • Place vibrating equipment or plant on a base separate to that on which any sensitive structure is located to reduce vibration impacts. • Programme deliveries to arrive during daytime hours only. • Take care when unloading vehicles to minimise noise. • Route delivery vehicles so as to minimise any noise disturbance to local residents as well as reducing potential vibration impacts upon structures • Do not leave plant engines unnecessarily idling. • Erect site hoarding, screens or barriers, as necessary and practicable, to shield noisy activities. • Site operatives will be briefed to refrain from shouting on-site. • Materials will be handled with care, e.g. material such as scaffolding and steelwork will be placed rather than dropped.

5.1.2 Monitoring

No construction noise monitoring is proposed unless complaints are received. Where complaints are received, monitoring shall be conducted to investigate and proactive measures undertaken by the construction team to reduce noise levels at source including revised plant and activity schedules, training regarding site rules or disciplinary action to staff.

The mitigation measures described above will be monitored by the PC throughout construction as set out within the EMP. If a non-conformity with any of the mitigation measures is identified, it will be recorded and appropriate remedial actions will be implemented.

5.2 Air quality

Exhaust emissions from construction vehicles have the potential to adversely impact local air quality, particularly local ambient concentrations of Nitrogen Dioxide and Particulate Matter, the two constituent pollutants of vehicle emissions which are most likely to breach their respective health based objectives. The dust caused by plant and vehicle movement has the potential to create localised pollution.

The nearest residential receptors is located approximately 100m to the east of the new infrastructure.

Access to the site will be via a temporary site access track off the Brighton Road. Given the relative remoteness and scale of construction it is unlikely there will be any significant temporary impacts on local air quality and amenity, the Brighton Road carried 9343 vehicles, including 131 HGV[1], and as such it is not likely there will be a noticeable increase in local traffic and through the adoption of the control measures below any small risk of adverse impact will be adequately controlled.

5.2.1 Control measures

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Air quality controls	• Ensure all construction traffic follows specifically designated routes. • Implement speed limits for all vehicular movements. • Cover all vehicles carrying loose materials. • Dampen down haul roads, as necessary, to reduce dust emissions. • Conduct all cutting and grinding operations in a manner to reduce the risk of dust migration, e.g. wet cutting techniques. • Adopt dust suppression techniques (e.g. water suppression) to reduce dust emissions from all crushing and screening activities. • Locate stockpiles away from any sensitive receptors, where feasible. • Seed / seal / cover soil stockpiles to reduce the risk of dust migration, where possible. • Carry out regular visual inspection of roads to ensure minimal dust and odour impacts upon local neighbours and wildlife. • Plant and equipment will be maintained with regular servicing and any dark smoke coming from vehicle/plant exhausts reported and rectified by repair or equipment replacement. • Wheels will be checked and cleaned where required prior to leaving the working area and joining the highways or public areas. • All vehicles carrying loose or potential dusty materials to or from the site will be fully sheeted. • Deliveries to site will be controlled to avoid queuing. • No construction plant or vehicle will leave its engine running when not directly in use, except where there are operational or other reasons to justify an exception. • Construction vehicles will comply with emissions legislation, servicing and MOT requirements: all vehicles used on-site shall comply with the relevant emissions standards and shall be serviced in accordance with the manufacturer's recommendations. MOT and service documentation shall be available/produced for the local authority's inspection if required. The PC is encouraged to use vehicles and plant that meet the most recent emissions regulations.

[1] Road traffic statistics - Manual count point: 16827 (dft.gov.uk)

5.2.2 Monitoring

No specific survey monitoring for air quality impacts is proposed. The mitigation measures described above will be monitored by the PC throughout the construction phase as set out in the EMP. If non-conformity with any of the mitigation measure is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.3 Biodiversity

The Preliminary Ecological Appraisal (PEA) also involved a site walkover was undertaken in April and May 2022, which identified the area of ancient woodland located to the west of Mannings Heath WTW. Subsequently, the habitat was inspected closely by an experienced ecologist/botanist to assess the habitat in the light of the proposed Mannings Heath WTW Transfer Scheme. An area of woodland approximately 30m either side of the ancient woodlands' mid-point was inspected to ensure that the whole area potentially affected by the scheme was covered. The field surveys identified any evidence and potential presence of protected and priority species which the woodland may contain. An assessment of the possible presence of these protected or priority species was completed. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. The methodologies and assessment criteria used were based on current published guidance where available.

Additional survey work was also undertaken, the full details of which are detailed in the Ecological Impact Assessment submitted in support of the planning application.

Habitats

The ancient woodland contains large, mature canopy trees and a shrub layer comprising of large multi-stemmed specimens which are potentially of considerable age. In addition, the affected area of woodland habitat contains at least 17 ancient woodland indicator species including yellow archangel *Lamium galeobdolon* and wood anemone *Anemone nemorosa*.

A small stream, over which the pipe bridge will be built, runs through the ancient woodland. This consists of a deep 'ghyll' stream valley with a very small stream running within it, a sensitive ecological feature supporting a number of widespread fern and bryophyte species on its earth banks. The Project Environment Management Plan, Arboricultural Assessment and Method Statement, and ECIA include measures to ensure the ancient woodland is safeguarded throughout the construction phase.

Badgers

The habitat within and surrounding the proposed works is suitable for badgers, though no evidence of badger was found within the WTW or the proposed pipe bridge and compound area. While no badgers or setts were found in proximity to the works a number of measures will be adopted to ensure they are safeguarded throughout the construction phase.

Bats

An assessment of trees in proximity to proposed site development was requested to establish the presence and suitability of features to support roosting bats and to provide recommendations for further detailed surveys and/or avoidance and mitigation measures pertinent to the proposed development. While no bats were found to be using any features in proximity to the works a

number of measures will be adopted to ensure foraging, commuting and roosting bats are safeguarded throughout the construction phase.

Dormouse
The hand search found no hazel nuts in the ancient woodland area which had been eaten by dormice. In addition, no signs of dormouse nests were found in the woody material found within the works area, and no dormouse footprints recorded from within the footprint tunnels.

Although no Dormice were found in or near to the ancient woodland, due to the understory of the ancient woodland containing hazel *Corylus avellana* with a line of large, well-developed hazels along the western edge, providing highly suitable dormouse habitat and as such a Precautionary Method of Working containing measures to ensure dormice are safeguarded throughout the construction phase.

Breeding Birds
The scheme has potential to impact breeding birds, including from proposed vegetation removal and trimming. Precautionary Method of Working will be adopted to ensure breeding birds are safeguarded through the construction phase.

Invasive Species
Three invasive plant species were identified within the woodland and are abundant all around the Mannings Heath WTW site perimeter: Rhododenron *Rhododendron ponticum*, Cherry Laurel *Prunus laurocerasus* and Variegated Yellow Archangel. Skunk cabbage *Lysichiton americanus* and floating pennywort *Hydrocotyle ranunculoides* were also found, located along River Arun/ Horn Brook, but away from the ancient woodland area.

5.3.1 Control measures

As a minimum, mitigation follows the principles set out in CIRIA Working with Wildlife: guidance for the construction industry (July 2011). All actions below are to be undertaken by a suitably experienced ecologist unless otherwise stated.

Southern Water's ecologist have produced a set of "Precautionary Method Statements" for wildlife and habitat protection which can be followed where risks have been assessed and found to be at a sufficiently low level.

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Protected species	• Where possible phase all construction activities to ensure that proposed construction works avoid disturbance and / or damage to local ecological constraints. • A pre-construction check for badgers will be completed by an Ecologist prior to commencement of the pipe bridge construction works. The ecologist will undertake a visual check of all areas of the woodland, and 30m each side of the proposed works for badgers and their setts. • Excavations will be fenced off and/or covered to avoid animals becoming trapped, with mammal ladders or a 45° slope installed. Site personnel to check these at the start and end of every working day. • Excessive noise and vibration will be controlled/ subject to acceptable limits near trees in the area of the pipe bridge construction, for example by using sound attenuation barriers to

	avoid indirect disturbance in case any bat species are present.
	• Where trees with low suitability for roosting bats require pruning or removal the works will be carried out under supervision by a suitably experienced ecologist. Any sections containing features suitable for roosting bats will be gently lowered to the ground and left in a nearby sheltered location for at least 48 hours to allow any bats to escape unharmed.
	• Best practice measures will be followed regarding bats and lighting (for both construction and permanent lighting), in accordance with the following standards and guidance:
	  • Guidance Note 8: Bats and Artificial Lighting in the UK (2018) – Bat Conservation Trust & Institution of Lighting Engineers;
	  • BS EN 12464-2: Light and Lighting – Lighting of Workplaces – Part 2: Outdoor Work Places (2014) – BSI
	  • Lighting Guidance 6: The Exterior Environment (2016) – Chartered Institution of Building Services Engineers
	• Ecological supervision of all vegetation removal in the woodland involving careful fingertips searching of any dense habitat and locations at the base of multi-stemmed shrubs where dormice tend to build nests.
	• Habitat manipulation involving removal of all woody vegetation above 200mm in height during the winter months, and subsequent grubbing up of root balls of trees and shrubs from May onwards to minimise any risk of impacts to hibernating dormice.
	• Any large hazels present along the western edge of the woodland that need to be removed for the proposed works will be coppiced (i.e. cut down to ground level), then the coppice stools dug up with as much earth intact around them as is possible and stored in a designated area for the duration of the works.
	• Perennial herbaceous vegetation including ancient woodland indicator species such as wood sedge Carex sylvatica will be dug up with large undisturbed rootballs under the supervision of the ecologist and also stored during the works and then replanted.
	• The plant material will be retained throughout the works period (which will require watering a couple of times per week from site staff during any droughts of especially hot spells) and placed back into the ground at a suitable location as part of the site reinstatement following completion of the works
	• A pre-construction check for breeding birds will be completed by an Ecologist prior to commencement of the pipe bridge construction. The Ecologist must undertake a visual check of all areas breeding birds may create nests within 30m of the pipe bridge.
	• Any vegetation suitable for breeding birds will be removed outside of the breeding bird season (peak breeding season is March to August inclusive).
	• If this is not possible, a nesting bird check will be carried out by an Ecologist within 48 ours prior to any vegetation clearance. If any active nests are discovered, an appropriate buffer will be established by the Ecologist and left in place until all young have dispersed.
	• Staff and subcontractors to report any protected flora / fauna discovered during construction to site management. Suspend all works within that area until authorised by an ecologist and site management.
	• Provide information (e.g. site induction / tool box talks) to site personnel.

Tree and hedgerow protection	• Any construction works will be undertaken in accordance with the Arboricultural Method Statement and Impact Assessment. • The site Ecological Clerk of Works will be an ecologist experienced in botany who can advise on which areas to retain, and the machine operators instructed to dig up clumps of plants whole complete with their root balls. • A designated space within the working easement immediately on the west side of the woodland will be used to store rootballs of shrubs and dug up clumps of perennial herbaceous species. • The ancient woodland indicator plant species in particular will be gathered and retained here, including yellow archangel Lamium galeobdolon, enchanters' nightshade Circaea lutetiana, wood anemone Anemone nemorosa, and wood sedge. • The rootballs of shrubs will be cut down to approximately 50cm in height before digging

	them up. • Shrubs in the outer 2.5m of the working width through the woodland will be coppiced down to the ground and left to regrow following completion of the works. This will include two of the largest and most ecologically valuable hazels. This maintains the ancient woodland and potential dormouse habitat. • Up to half of the shrubs in the woodland working area will be coppiced and left to regrow. • Dead wood material produced from coppicing will be used to create log piles and create habitat for stag beetles, as well as diversifying the structure of the woodland. • Protection from deer browsing is to be used when the shrubs are replanted to increase survival chances. • Protecting the stream and its fern and bryophyte-covered sides from any impacts so that it remains intact. • Any risk of pollution from dust or other material will be carefully controlled to avoid this entering the stream or affecting its banks. • Provide information (e.g. site induction / tool box talks) to site personnel. • Comply with any mitigation or requirements associated with affected vegetation.
Invasive species	• A pre-construction check for INNS will be completed by an Ecologist • Removal/ control of invasive plant species by cutting and treating stumps of Rhododendron and Cherry Laurel, and by carefully digging up and disposing of clumps of Variegated Archangel. • Additionally, any aquatic plant INNS present will be assessed in terms of potential to be spread by the works.

5.3.2 Monitoring

The following monitoring is to be undertaken during construction of the proposed development:

- Regular checks for badgers;
- Where areas of the proposed development are left dormant an ecological appraisal of the area is recommended. This is to assess if protected species have moved into the area and to asses if the area is suitable for protected species;
- The mitigation measures described above will be monitored by the PC throughout the construction phase as set out in the EMP. If non-conformity with any of the mitigation measure is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.4 Visual impact and lighting

Construction activity can require the use of lighting to allow safe working outside daylight hours and in areas restricted from natural light. This has the potential to cause nuisance and adversely impact upon nearby sensitive receptors including local residents and ecology. Lighting which causes glare can also negatively affect workers.

Controlling the amount of light pollution (backlight / up-light and glare) generated on-site not only reduces and/or mitigates nuisance and disturbance, but also reduces the energy used on-site.

The proposed works are not overlooked and are relatively remote though there is potential presence of bats within the surrounding vegetation.

5.4.1 Control measures

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Visual impact and light controls	• Erect site hoarding, screens or barriers, as necessary and practicable, to screen site activities. • Choose and assemble site lighting to reduce light nuisance impacts to local neighbours and wildlife. • Position lighting properly and direct light downwards to minimise impacts of light pollution on neighbours and wildlife. • There will be no direct upward lighting. • Switch off-site lighting or minimise its use during periods of site inactivity. • Keep site boundaries clean and tidy at all times. Maintain hoarding and / or fencing so as to be free of graffiti and non-project specific posters. • Repair damaged or unsightly hoarding and / or fencing, as soon as possible. • It is not anticipated that any construction works will be carried out at night, when this is required it will be with prior agreement from the LPA and will include details of the lighting requirements.

5.4.2 Monitoring

Site management personnel will monitor the construction works on an ongoing basis to ensure that all protective fencing and lighting remains in place and in good condition for the duration of the construction works. Any repairs required will be completed as soon as practicable.

The measures identified above will be monitored by the PC throughout the construction phase as set in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.5 Cultural heritage and archaeology

Archaeological remains are part of the historic environment, but their presence is often unknown. Therefore, wherever excavation is undertaken there is a risk of archaeological finds being discovered.

An archaeological review of the location and proposed works was carried out by a suitably experienced and qualified archaeologist. The review identified that there are no statutory designated heritage assets within or adjacent to the WTW site. The review also concluded that the WTW site is not located with a conservation area and the site is not located within an archaeological notification area. A historic Desk Based Assessment (DBA) was undertaken to establish if further evaluation work will be required as there is a risk of previously undisturbed archaeology being present. However given the small scale extent of the proposed excavation associated with the pipe bridge piers it is assessed there is a low risk of encountering and disturbing any archaeology and therefore standard construction measures will suffice.

5.5.1 Control measures

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Cultural heritage and archaeology	• Tool box talks will be given to contractors to ensure that during excavations contractors will look out for burned or blackened material, brick or tile fragments, coins, pottery or bone fragments, skeletons, timber joists or post holes, brick or stone foundations, infilled ditches. • If unsure about a possible find the PC will call an archaeological specialist to assess it. • Should items of potential archaeological interest be uncovered unexpectedly during excavation, stop works in the immediate area and a photograph of the find shall be e-mailed to the archaeological specialists to recommend appropriate actions.

5.5.2 Monitoring

In addition to the WSI methodology the site management personnel will monitor the construction works on an ongoing basis to ensure that all excavations and intrusive works are undertaken within the confines of the area of proposed development. Well in advance of any excavations being extended outside of the agreed working area advice will be sought from an archaeological officer to review whether any archaeological mitigation measures are required.

The measures identified above will be monitored by the PC throughout the construction phase as set in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.6 Soil and land use management

Soil is a valuable resource and will be a common material involved in the construction of the proposed development. Therefore, it needs to be carefully handled to allow reuse on-site and minimise the amount requiring removal.

This section describes the measures to be taken to minimise the risk of negative impacts on soils resulting from the proposed development. Planned aspects/activities conducted that pose a risk of creating these impacts are:

- Soil stripping;
- Excavation works;
- General site activities;
- Removal of trees and scrub;
- Construction of access roads;
- Topsoil stripping; and
- Grading.

5.6.1 Control measures

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Earthworks	• Avoid stripping soil following periods of heavy rainfall (i.e. 5mm or more in a 24-hour period), when practicable. • Keep areas of exposed ground to a practicable minimum. • Segregate top and subsoil stockpiles. • Topsoil will be scraped back and stored on-site for re-use as required. • Handle soils carefully to minimise potential soil structure damage. • Keep temporary stockpile heights as low as possible given space restrictions, e.g. 3m for topsoil and 4m for subsoil. • Minimise run-off from stockpiles by light compaction and at an angle of no more than 45°, use of trenches and locating stockpiles away from drainage systems and watercourses. • Protect stockpiles to minimise erosion losses and weed infestation if storage is to be longer than 6 months (e.g. seeding or light compaction). • Protect stockpiles (e.g. using berms or grips) from flooding to avoid soil losses. • Keep traffic off soil stockpiles, as much as possible, throughout the period of soil storage. • Display clear and unambiguous signage to notify site personnel of the presence of different types of soil stockpiles. • Avoid reinstating soils following periods of heavy rainfall (i.e. 5mm or more in a 24-hour period), when practicable. • Reinstate subsoil to maintain natural drainage patterns and avoid settlement. • Reinstate topsoil by rendering into a loose and workable condition as well as contouring to maintain the profile with the adjacent undisturbed area. • Implement effective temporary and / or permanent soil erosion control measures, where necessary. • Implement and maintain suitable, adequate and effective control measures to prevent run-off from stockpiles contaminating surface waters.
Export of soils	• Ensure that a Materials Management Plan (compliant with the CL:AIRE Code of Practice) is developed or an Environmental Permit is obtained for the export and use of more than 1,000 tonnes (over a 3 year period) of waste soils. • Ensure all waste Duty of Care legislation is complied with in relation to the transport and disposal of waste soils.

5.6.2 Monitoring

The measures identified above will be monitored by the PC throughout the construction phase as set in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.7 Resource management

5.7.1 Control measures

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Energy conservation	• When possible, procure electricity supplies through the PC energy broker. • Ensure time controls and thermostats are set to take account of unoccupied periods so

Aspect	Environmental control measure(s)
	that heaters are off when there is no one around. • Fix any draughts or damage to windows, window frames and / or doors. • Ensure windows / doors are closed when the heating systems are on. • Insulate hot water distribution pipes. • Switch off all non-essential lighting in unoccupied areas. • Switch off external lighting during the day. • Ensure light sensors and timers are correctly set. • Make sure generator(s) are correctly sized for their proposed use. • Ensure generators or other diesel plant are not left unnecessarily idling. • Make sure generator(s) are regularly maintained by the owner / supplier. • Ensure construction plant are well maintained to maximise fuel efficiency. • Ensure compressors correctly sized for their proposed use. • Ensure there are no leaks or damage to compressor systems. • Ensure compressors turned off to avoid being left unnecessarily idling. • Make sure compressor(s) are regularly maintained by the owner / supplier. • Ensure unused office equipment (e.g. printers, mobile phone chargers, fans, coffeemakers, radios) that drain energy when not in use are turned off and / or unplugged. • Ensure power management features are enabled (i.e. sleep mode) on all office equipment (e.g. photocopiers, printers, and computers). • Ensure office equipment (e.g. computers, monitors, photocopiers) are turned off at the end of the work day. • Ensure photocopiers / printers are set to default by printing on both sides • Ensure electrical appliances (e.g. fridges) have a European Union Energy Rating of A or B. • Provide employees / subcontractors with awareness training regarding conserving energy and hence reducing costs. • Encourage employees / subcontractors to suggest energy saving ideas.
Water conservation	• Turn off hose pipes when not in use. • Switch off taps when not in use. • Ensure there are no water leaks. • Within site accommodation, use water boilers rather than kettles to encourage water savings. • Where possible, install water efficiency measures, e.g. low water flush toilet cisterns. • Where feasible, implement rainwater harvesting on-site. • Provide employees / subcontractors with awareness training regarding water conservation. • Encourage employees / subcontractors to suggest ideas for saving water.
Storage of raw materials	• Store and handle all construction related materials so as to prevent; • Damage; • Degradation of material quality characteristics; • Contamination of the material and / or the external environment; • Excessively long on-site storage periods; and • Loss through theft and vandalism. • Conduct walk-through surveys (using the Workplace Weekly HS&S Inspection) to review construction related material handling and storage practices to ensure that material integrity and quality are being maintained and that their handling and storage is not contributing to an adverse environmental impact.
Import of recycled aggregates	• Ensure that recycled aggregates have been produced in conformance with the Aggregates Quality Protocol: Production of Aggregates from Inert Wastes if more than 5,000 tonnes (over a 3 year period) are to be imported. Retain documentation to verify conformance to the Aggregates Quality Protocol.

Aspect	Environmental control measure(s)
	• Obtain a U1 Environmental Permit Exemption for the import of less than 5,000 tonnes (over a 3 year period) of recycled aggregates that does not conform to the Aggregates Quality Protocol. • Develop and / or obtain a Materials Management Plan (compliant with the CL:AIRE Code of Practice) or an Environmental Permit for the import of more than 5,000 tonnes (over a 3 year period) of recycled aggregates that does not conform to the Aggregates Quality Protocol. • Reject all loads of delivered recycled aggregates that does not appear to meet the defined material specification, e.g. 6F2; 6F5; Type 1; Type 2. • Reject all loads of delivered recycled aggregates that contains more than 1% by mass of Class X materials, i.e. wood, plastic and / or metal. • Reject all loads of delivered recycled aggregates that contains any asbestos materials or smells of hydrocarbons, e.g. oils / diesels.
Crushing inert aggregates	• Ensure that subcontractors' crushing plant has been issued with a PPC Permit issued by a Local Authority. Retain a copy of the issued PPC Permit within site documentation. • Ensure that recycled aggregates are produced in conformance with the Aggregates Quality Protocol if more than 5,000 tonnes (over a 3 year period) are to be produced. Retain documentation to verify conformance to the Aggregates Quality Protocol. • Obtain an Environmental Permit if more than 5,000 tonnes (over a 3 year period) of aggregates / soils are to be screened on-site. • Obtain a T5 Environmental Permit Exemption if less than 5,000 tonnes (over a 3 year period) of aggregates / soils are to be screened on-site. • Obtain a U1 Environmental Permit Exemption for the use of less than 5,000 tonnes (over a 3 year period) of crushed recycled aggregates that does not conform to the Aggregates Quality Protocol. • Develop and / or obtain a Materials Management Plan (compliant with the CL:AIRE Code of Practice) or an Environmental Permit for the use of more than 5,000 tonnes (over a 3 year period) of recycled aggregates that does not conform to the Aggregates Quality Protocol.

5.7.2 Monitoring

The measures identified above will be monitored by the PC throughout the construction phase as set in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.8 Land contamination

This section advises on how to manage risks due to land contamination and how to avoid spreading contamination. Land contamination can be caused by previous land use, presence of landfill, criminal activity such as fly-tipping or naturally occurring substances in the land.

The proposed works are within an operational WTW therefore, there is a risk of encountering contaminated soil. No historic or authorised landfills have been identified within 250m.

Construction activities physically affect land that may create pathways by which contaminates can reach receptors and cause risks to:

- Site-based staff through direct contact with soils or inhalation of dust or gases;
- Ecological systems;

- Buildings and structures;
- Ground and surface waters; and
- Users of the land through contact with soil or via food grown on the land.

Land contamination may also give rise to leachates that can also pollute ground and surface waters.

5.8.1 Control measures

All the workers on-site will be made aware of potential contamination issues. The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Ground contamination	• Cordon off areas of contamination from those that are uncontaminated. • All the on-site construction workers on-site will be made aware of potential contamination issues. • Use of Personal Protective Equipment. • Appropriate storage of fuels and oils and process to manage any leaks or spills from equipment. • Develop and implement a disposal strategy for the management of contamination. • Use competent contractors to implement any defined or disposal strategy. • Ensure all appropriate environmental permissions have been obtained where reuse and / or disposal of contaminated soils is to be undertaken, e.g. a Mobile Plant Licence or an Environmental Permit or Exemption; Waste Acceptance Criteria Testing has been undertaken on treated and / or untreated soils when disposing to landfill. • Store contaminated soils in areas effectively demarcated from construction works and access / egress routes. • Place soils on impermeable surfaces to prevent contamination of the underlying ground. • Cover stockpiles to prevent windblown dust or the ingress of rainwater, where practicable. • Implement controls for containing surface water run-off from contaminated stockpiles to prevent the uncontrolled discharge of contaminated effluent. • Display clear and unambiguous signage to notify site personnel of the presence of contaminated soils. • Should unexpected contamination be encountered, a contaminated land specialist will be contacted for further advice.
Hazardous materials storage	• The handling, use and storage of hazardous materials will be undertaken in line with The Control of Pollution (Oil Storage) (England) Regulations 2001. • Develop a Spill Response Plan. • Store hazardous materials more than 10m from a watercourse or surface water and / or foul water drainage gullies. • Hazardous materials proposed to be used during the construction works will be identified and an appropriate Control of Substances Hazardous to Health (COSHH) Assessment carried out in accordance with COSHH Regulations 2002. • Undertake COSHH assessment for hazardous materials. • Segregate COSHH raw material stores and COSHH waste stores. • Develop a Hazardous Materials & COSHH Register documenting materials stored and handling requirements. • The site emergency preparedness and response plan will be available on-site. • A COSHH register will be produced and maintained on-site; • Store hazardous material containers on secondary containment systems that will

Aspect	Environmental control measure(s)
	contain 110% of the contents of the largest container or 25% of the total, whichever is greater. • Protect hazardous material containers so as to minimise the ingress of rainwater and secure them against accidental damage. • Maintain and inspect hazardous material bunds and spill kits. • Monitor hazardous material storage areas for leaks and signs of spillage. • Provide site spill kits with instructions in areas of high risk. • Undertake spill response exercises / drills at a frequency as defined within the Spill Response Plan. • Train site personnel in the use of spill kits and the correct disposal of used material. • Residue cement and concrete will be placed in a designated lined and covered skip, the skip will be placed on a plastic liner to collect any spillages. • Drivers delivering concrete will be informed of the brush off facilities and supervised while they use them. • Concrete socks will be used where possible to cover the concrete chutes. • Water collected within the skip will not be allowed to enter any drains or watercourses and will be removed from site as a waste.
Refuelling	• Undertake all plant refuelling on hardstanding or within defined areas that utilise drip trays / plant nappies. • Provide secure valves and nozzles on fuel storage tanks / bowsers. • Conduct refuelling activities at least 10m away from watercourses or surface / foul water drainage gullies. • Locate spill kits in all appropriate locations, with instructions for use. • Ensure training has been provided to those that conduct refuelling activities on correct refuelling procedures.

5.8.2 Monitoring

The measures identified above will be monitored by the PC throughout the construction phase as set in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.9 Transport management

Construction traffic has the potential to cause nuisance through noise, exhaust emissions, dust, and congestion and to create a safety hazard both on and off-site. Access to the site will be via a temporary site access track off the Brighton Road.

A Traffic Management Plan has been produced and submitted as a supporting document to the wider planning application to ensure appropriate traffic management and minimise any disruption.

5.9.1 Control measures

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the project.

Aspect	Environmental control measure(s)
Use of public, temporary and permanent haul	• Implement a Traffic Management Plan (TMP). • Identify local receptors that may be adversely impacted by traffic related nuisance complaints (e.g. noise, congestion and visual).

Aspect	Environmental control measure(s)
roads	• Establish and maintain contact with local residents and other potentially affected parties prior to the commencement of, and during, construction works in order to avoid any potential traffic nuisance related complaints. • Ensure all construction related traffic uses agreed access points, as defined within the Traffic Management Plan. • Ensure contractor Heavy Goods Vehicles are in good working order and hold a valid MOT certificate. • Ensure all vehicles carrying loose material are covered. • Obtain permission from the owner of street furniture (e.g. local authority or Local Highway Authority) prior to attaching directional signage. • Install hardstanding to reduce mud transfer onto public roads. • Use wheel wash facilities / road sweepers, where appropriate, to keep public roads clear of dust and mud where required • Ensure all material suppliers adhere to agreed working hours in relation to material deliveries. • Ensure all vehicles adhere to the site speed limits, including when accessing Park Road from the public highways. • Public not expected on-site during the works. Pedestrian management will be as per CDM control measures.

5.9.2 Monitoring

The measures identified above will be monitored by the PC throughout the construction phase as set in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.10 Waste management

Construction waste needs to be managed appropriately through its production, storage and disposal. Wastes are likely to result from the following activities:

- Excavated materials (soils or substrata);
- Green waste (from vegetation removal or management); and
- Construction materials (e.g. concrete, aggregates)

5.10.1 Control measures

Specific mitigation and control measures will be developed by the PC and included in a Site Waste Management Plan (SWMP). The SWMP will be prepared in accordance with the waste hierarchy to minimise generation and disposal and maximise re-use and recycling. For example, through the re-use of excavated soils and green waste on-site for landscaping and through the recycling of inert material, where possible.

The SWMP will consider the sourcing, transport, use and disposal of materials in a sustainable manner. It will be reviewed to take account of changes as the design is finalised. It will ensure that unavoidable construction waste is identified at an early stage so it can be managed in accordance with the waste hierarchy and other relevant legislative requirements. The SWMP would be used to derive the management options that would achieve the highest practicable performance levels within the hierarchy.

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)
Waste storage, handling and segregation	• Store wastes in areas away from surface / foul drains and watercourses. • Segregate all construction wastes, at a minimum, into hazardous and non-hazardous waste streams. • Segregate construction wastes into dry recyclables. • Cover waste containers if there is a risk that wastes may be blown out or the wastes contained therein are water sensitive, e.g. plasterboard wastes. • Use waste signage, i.e. labels that specify waste contents. • Secure waste containers (NOTE: On unsecure sites or in areas where theft and vandalism may occur, skips should be lockable). • Use approved and licenced contractors.
Off-site disposal of site waste streams	• Develop, implement and maintain a Site Waste Management Plan (SWMP) throughout the duration of the project. • Use the Waste Transfer Note for the off-site disposal of all non-hazardous wastes • Use Hazardous Waste Consignment Notes for the off-site disposal of all hazardous wastes • Retain all WTNs for at least three years • The PC will obtain copies of waste carrier registrations and environmental permits including associated schedules of wastes or permit exemptions prior to removing waste from site. • Every proposed destination-site will be checked to ensure that a valid permit or waste exemption has been issued under the Environmental Permitting (England and Wales) Regulations 2007. • All waste will be disposed of in accordance with the Duty of Care and all other relevant environmental legislation. • Periodic audits will be undertaken to ensure compliance with the Duty of Care. • Only use licensed waste carriers to transport wastes from site and obtain documentation to demonstrate registration • Where it is suspected that a waste contractor is not complying with the legal Waste Duty of Care, follow up checks shall be made. Where it is demonstrated that waste is not being managed in accordance with legislation and where this cannot be rectified, the contract with the waste contractor shall be terminated.

5.10.2 Monitoring

Subject to the requirements of the SWMP, waste management will be monitored throughout the construction phase by the Site Manager. Whenever waste is removed from the site, details will be recorded in the SWMP. The SWMP will also be updated regularly to show the types and quantities of waste that are re-used, recycled, recovered by any other means, sent to landfill or disposed of by any other means.

A thorough review of the waste management records or SWMP will be carried out monthly, to assess performance against the SW targets. The review should include calculating the costs of waste treatment and disposal.

The site manager shall allocate responsibility to a nominated person to carry out waste audits/inspections at regular intervals to look at the following:

- Quantities of each type generated, reasons why and its costs implications;
- How wastes are being handled and stored; and

- Recommendations for improving waste management.

Carrying out audits will provide valuable information to help set targets for improvement and will show how well waste management initiatives from the action plan are working on-site.

5.11 Flood risk management

This section provides a summary of the baseline for the flood risk to the proposed development and identifies either on-site or off-site receptors that that could be sensitive to the proposed development.

Gov.uk Flood Risk Maps for planning indicates that the proposed works are in a Flood Zone 1 (low risk of flooding from rivers 1 in 1000 to 1 in 100), Long term flood risk maps indicates the site is predominantly of very low risk of flooding from surface water.

5.11.1 Control measures

The following industry best practice general measures are to be implemented during the construction phase:

- Construction will not be undertaken during extreme wet weather;
- Construction works will avoid taking place during periods of high groundwater conditions;
- Temporary elements will be located outside: the flood zones; areas at risk of surface water flooding; and, at risk of groundwater flooding, where possible;
- Where temporary elements cannot practicably be located outside of surface water flood risk areas, these shall be stored for a restricted time, and in a manner which allows for water flow past these structures, e.g. appropriately-shaped, protected and with gaps between, and
- Construction workers will be briefed on areas of high groundwater levels/risk of groundwater flooding.

5.11.2 Monitoring

The measures identified above will be monitored by the PC throughout the construction phase as set out in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.12 Water management

The objective of this section is to implement working methods to protect surface water and groundwater from pollution and other adverse impacts including change to flow, volume, water levels and quality. Controlled watercourses have legal protection from harm and pollution.

Pollution can result from any of the following entering a body of surface or groundwater:

- Poisonous, noxious or polluting matter;
- Waste matter (including sediment, concrete, oil, petroleum spirit, chemicals, solvents, sewage and other polluting matter); and
- Other harmful activities detrimentally affecting the status of a water body.

The status of a waterbody can also be affected directly or indirectly, including changes in physio-chemical parameters such as temperature and turbidity or physical modifications to the hydrology of a water body.

5.12.1 Control measures

The environmental control measures defined below apply to all personnel including company employees, sub-contractors, suppliers and third parties; and all activities and operations associated with the proposed development.

Aspect	Environmental control measure(s)

Abstraction, impounding & dewatering	• Obtain an abstraction licence from the EA for the abstraction of more than 20m^3 of water / day from any controlled water where required.
	• Obtain an abstraction licence if waters from dewatering activities are to be used, e.g. for dust suppression.
	• Methods for management and monitoring of water discharges and prevention of pollution will be included in PC's method statements. The relevant sections of BS6031:2009 Code of Practice for Earthworks for the general control of site drainage/discharges will be followed.
	• The construction activities associated with the proposed works may require the temporary discharge of water from excavations. All dewatering activities are to be undertaken in accordance with the 'Temporary dewatering from excavations to surface water' Regulatory Position Statement (RPS) published by the EA in February 2018. Where the conditions of this EA guidance cannot be met, an environmental permit may be required for this temporary activity.
	• Under no circumstances will discoloured or contaminated water be allowed to enter drains. All reasonable precautions will be taken to prevent contamination of surface waters either directly or indirectly. Contamination includes, but is not limited to:
	  ○ Oily residues;
	  ○ Chemicals and paints;
	  ○ Concrete washout water;
	  ○ Sediment (e.g. muddy / silty water); and
	  ○ Flushing out of pipework during commissioning.
	• Ensure that a pump head rose is used to reduce the risk of harm to aquatic life.
	• Before any pumping activity the following measures will be undertaken:
	  ○ Each pump will be fitted with filters to ensure that sediment and other particulates that may be suspended within the water is removed prior to the discharge of the water;
	  ○ Pumping rates to be controlled so as to avoid erosion or scour of the receiving environment;
	  ○ A visual inspection of the water will be undertaken for signs of pollution (e.g. oil, cement), if any pollution is visible no pumping will take place;
	  ○ Evidence of pumping activity to be recorded and kept within the site folders.
	• Ensure conformance to requirements of obtained licences / authorisations.

Discharges to surface water or groundwater	• Consult with the EA as to the need for an Environmental Permit for the discharge of effluent to surface waters prior to the discharge proceeding. • Obtain permission from the landowner to discharge sediment-laden waters to land and consult with the EA prior to discharge. • Ensure all effluent discharges from site cabins are directed into sewers (with permission from the local water company) or holding tanks. • Ensure conformance to requirements of obtained permits / authorisations.
Discharges to sewer	• Obtain a trade effluent discharge consent from the local water company or written permission from the sewer owner prior to the discharge of any trade effluent into a foul sewer.

Aspect	Environmental control measure(s)
	• Ensure that the company's Permit-to-Pump system is used for all effluent pumping activities. • Ensure conformance to requirements of any obtained consent.
Works in, near or over controlled waters	• Give the EA at least seven working days' notice of any intention to temporarily or permanently divert the flow of a main river; carry out works over or within a main river channel; commence operations in a main river channel; or work on or near foul sewers. • Obtain formal approval from the EA prior to the use of any herbicide in or near a watercourse (i.e. within 10m of a watercourse). • Plant and equipment entering or working alongside watercourses should be well-maintained, clean and free from oil leaks. • Prevent liquid / solid debris falling into a watercourse or onto an embankment during construction activities. • Ensure conformance to requirements of any obtained consent / approval.
Site drainage	• Display surface and foul water drainage systems and nearby controlled waters. • Implement and maintain control measures to ensure site drainage does not contaminate drains or watercourses, e.g. cut-off ditches / silt fences. • Provide tool box talks to relevant personnel and contractors that effluent must not be poured down surface / foul water drains without permission.
Washing activities	• Conduct all washing and cleaning operations (including the washing of vehicles and / or plant) in a designated area, which should be isolated from the surface water drainage systems and within hardstanding areas. • Ensure no detergent contaminated wash down effluent is allowed to enter controlled waters unless permitted by the EA. • Direct detergent contaminated wash down effluent via the foul sewer (after having gained permission from the Water Company or ensure that it is contained for off-site disposal. • Establish an impermeable concrete / mortar washout area at least 10m away from drains; surface waters; or trees.

5.12.2 Monitoring

Regular visual checks of any controlled watercourses and discharge points will be undertaken to check for the following:

- Changes in water colour;
- Changes in water transparency;
- Oil sheen to the water surface;
- Scum or foam build up on the surface;
- Signs of dead plants or animals; and
- The condition or any control measures such as silt fencing.

Daily monitoring will also be undertaken to ensure the settlement tank is working effectively and the water is the desired water quality where used.

The measures identified above will be monitored by the PC throughout the construction phase as set in the EMS. If non-conformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

5.13 Environmental tool box talks

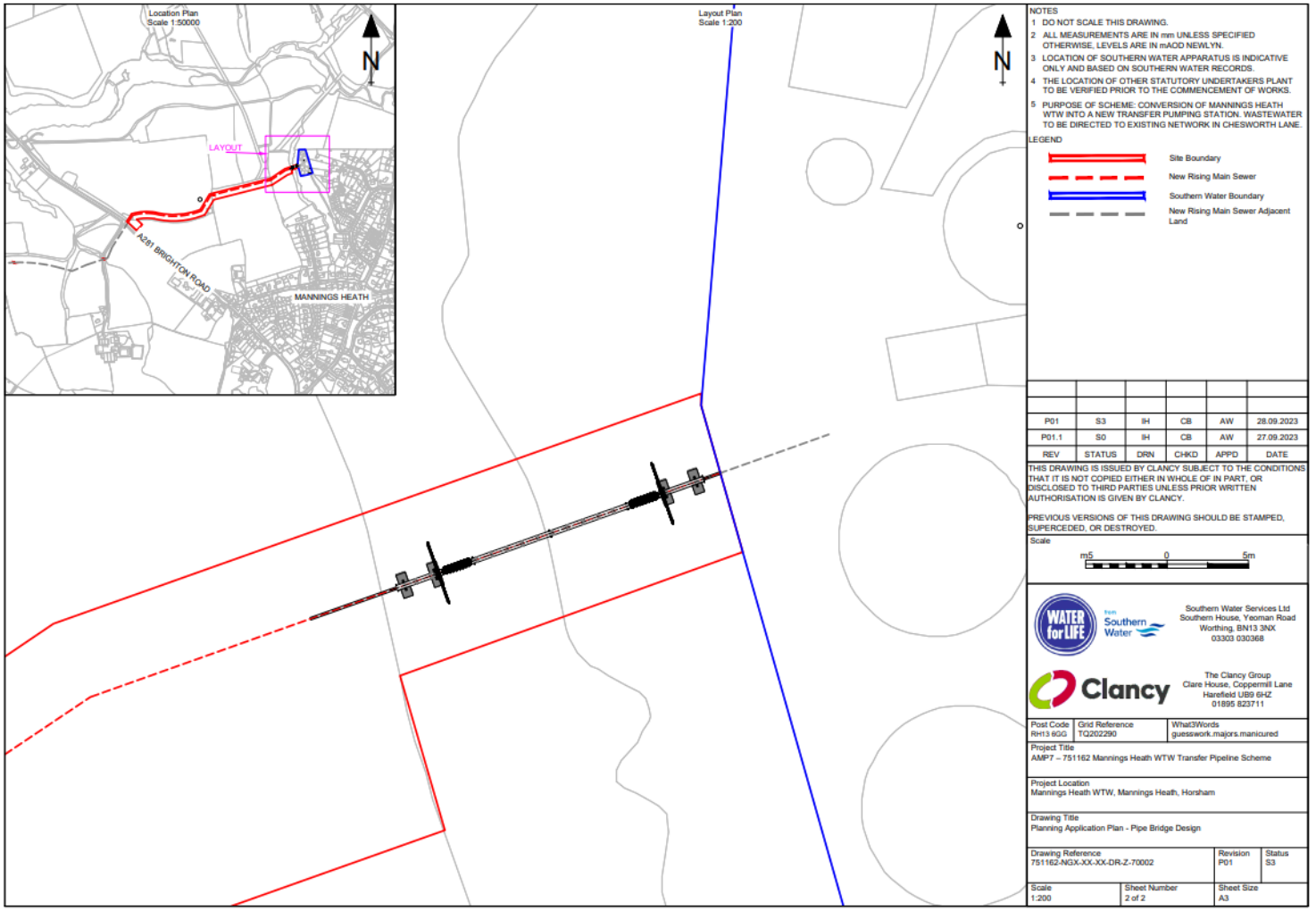
Courses are run by the PC covering various environmental issues. For site personnel, the site induction will be used to promote overall environmental awareness as well as employee and subcontractor environment management responsibilities. The site induction will be further

enhanced through the delivery of a series of toolbox talks as shown in the table below, that should be delivered to relevant site personnel on an on-going basis.

Environmental tool box talks
Tree protection
Japanese knotweed
Himalayan balsam
Giant hogweed
Bats
Badger
Great Crested Newt
Hazel Dormouse
Reptiles
Water Vole
Birds
Bees
Spill control
Petrol, diesel and oils
Bentonite
Water pollution prevention
Water pollution – sediment
Water pollution – cement and concrete
Pumping and over-pumping
Washing down plant and machinery
Soil planning and management
Stripping topsoil
Stripping sub-soil
Stockpiling soil
Spreading soil
Sourcing topsoil
Manufacturing topsoil
Soil aftercare
Use of surplus soil
Working with previously developed land
Unexploded Ordnance
Dust and air quality
Noise and vibration
Be a good neighbour
Materials management and housekeeping
Energy conservation – construction-site good practice
Timber procurement
Waste management
Storage of waste
Waste segregation

The delivery of these environmental tool box talks should be planned during the ‘4-week planning meeting’ that is held between the Operations Management Team and the HS&S Advisor.

Appendix A: Proposed Development (Low Res)



Appendix B: Environmental Information Map