



Havant Thicket Reservoir – Main Pipeline Works

Construction Environmental Management Plan (CEMP)

HTR-WAB-PI-XX-HS-W-0006

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Suitable for Construction Approval

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Issue and Revision Record

Havant Thicket Reservoir – Main Pipeline Works

Construction Environmental Management Plan (CEMP)

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1 Abbreviations and Definitions

Client	=	Portsmouth Water Limited
CMP	=	Communications Management Plan
Contractor	=	Ward and Burke Construction Limited
CQP	=	Contractors Quality Plan
CSFs	=	Critical Success Factors
CTMP	=	Construction Traffic Management Plan
CWTP	=	Construction Workers Travel Plan
EA	=	Environment Agency
ECoW	=	Ecological Clerk of Works
EnCoW	=	Environmental Clerk of Works
ES	=	Environmental Statement
HSWE	=	Health, Safety and Wellbeing Environment
HTR MPW	=	Havant Thicket Reservoir Main Pipeline Works
HTR MRW	=	Havant Thicket Reservoir Main Reservoir Works
INNSA	=	Invasive Non-Native Species Association
MPW	=	Main Pipeline Works
NR	=	Network Rail
OCI	=	Optimised Contractor Involvement
PCA	=	Property Care Association
PMMP	=	Pollution Management and Mitigation Plan
PW	=	Portsmouth Water Limited
RAMS	=	Risk Assessment and Method Statement
REAC	=	Register of Environmental Actions and Commitments
SAC	=	Solent Maritime Special Area for Conservation
SINC	=	Sites of Importance for Nature Conservation
SPA	=	Special Protection Areas
SPZ1	=	Source Protection Zone 1
SWS	=	Southern Water Services
TBT	=	Toolbox Talk
WBCL	=	Ward and Burke Construction Limited

2 Introduction and Scope

1. The objective of the Havant Thicket Reservoir Project is to provide a new resource to supply drinking water in the water-stressed Southeast of England, while maximising the community and environmental benefits of a new raw water reservoir.
2. Ward and Burke Construction Limited (WBCL) have been appointed by Portsmouth Water Limited (PW) to design, construct, and commission a new pipeline connecting Bedhampton Pumping Station to Havant Thicket Reservoir, including an emergency discharge structure at the Hermitage Stream, culvert upgrades and an Under Track Crossing.
3. The pipeline corridor extends from the Portsmouth Water pumping station at the Bedhampton works, northwards to the proposed control house within the reservoir site. It passes through the Leigh Park Estate under local roads and open spaces. The corridor also runs north along the Hermitage Stream before turning north-east and broadly following the Riders Lane Stream towards the reservoir site. The southernmost point of the pipeline is located approximately 1 km north of Chichester Harbour and Langstone Harbour, which are Special Protected Areas (SPA) and Solent Maritime Special Area for Conservation (SAC).
4. A combination of open cut and micro-tunnelling techniques will be used for the construction of the pipeline. Open cut techniques will take place in two locations: the council playing fields adjacent to Havant Rugby Club; and land in the southwest of Staunton Country Park. Micro-tunnelling will be used for the remainder of the pipeline construction facilitated by eight construction shafts and the emergency discharge chamber.

2.1 Project Drivers

5. Portsmouth Water have outlined seven strategic drivers for this project to ensure continued focus on meeting the Project's objectives. These project drivers are:
 - **Quality:** Quality in procurement, design, and delivery to deliver an exemplar project to serve Customers in the short, medium, and long term,
 - **Timeliness:** In service and operating by 2029 to support a major bulk transfer to Southern Water,
 - **Innovation:** Develop best practice in the largest new reservoir project in the southeast for decades. Capture learning from companies working in partnership to deliver better value for Customers,
 - **Flexibility:** Create a project that offers multiple uses and enables Portsmouth Water to be a strategic water supplier for the South over the medium and long term,
 - **Responsibility:** Realise and build upon our health, safety, and well-being goals,
 - **Connectivity:** Positive connection for all stakeholders – Customers, the local community, regulators, staff, contractors, shareholders, commercial partners, environmental groups, and individuals with a passion for the environment, and
 - **Environment:** A positive contribution to local and internationally important habitats. Direct support for Government's objective to reduce the damaging abstraction of water from rivers.

2.2 Scope of Document

6. This CEMP forms part of a planning application for a revised pipeline scheme between the Havant Thicket Reservoir and Bedhampton springs and pumping station. Following outline approval of a pipeline scheme in October 2021 (Havant Borough Council ref. APP/20/00991), a new pipeline route and design have been identified, which needs a new planning approval. There has also been a change in approach to deliver additional resilience to the water network, with an additional pipe now being proposed. The new water pipes would be installed inside two adjacent tunnels which would be constructed concurrently to ensure maximum efficiency is achieved, with construction programme durations, and subsequent disruption to residents minimised.
7. This CEMP identifies the project management structure, roles and responsibilities and compliance monitoring with regards to managing and reporting environmental aspects and impacts of the HTR MPW. The CEMP will be a live document and will be maintained and altered in response to changes in environmental risks with approval

of the client, throughout the duration of the main pipeline construction and will eventually develop into the Handover Environmental Management Plan (HEMP).

8. The overall objectives of the CEMP are as follows:

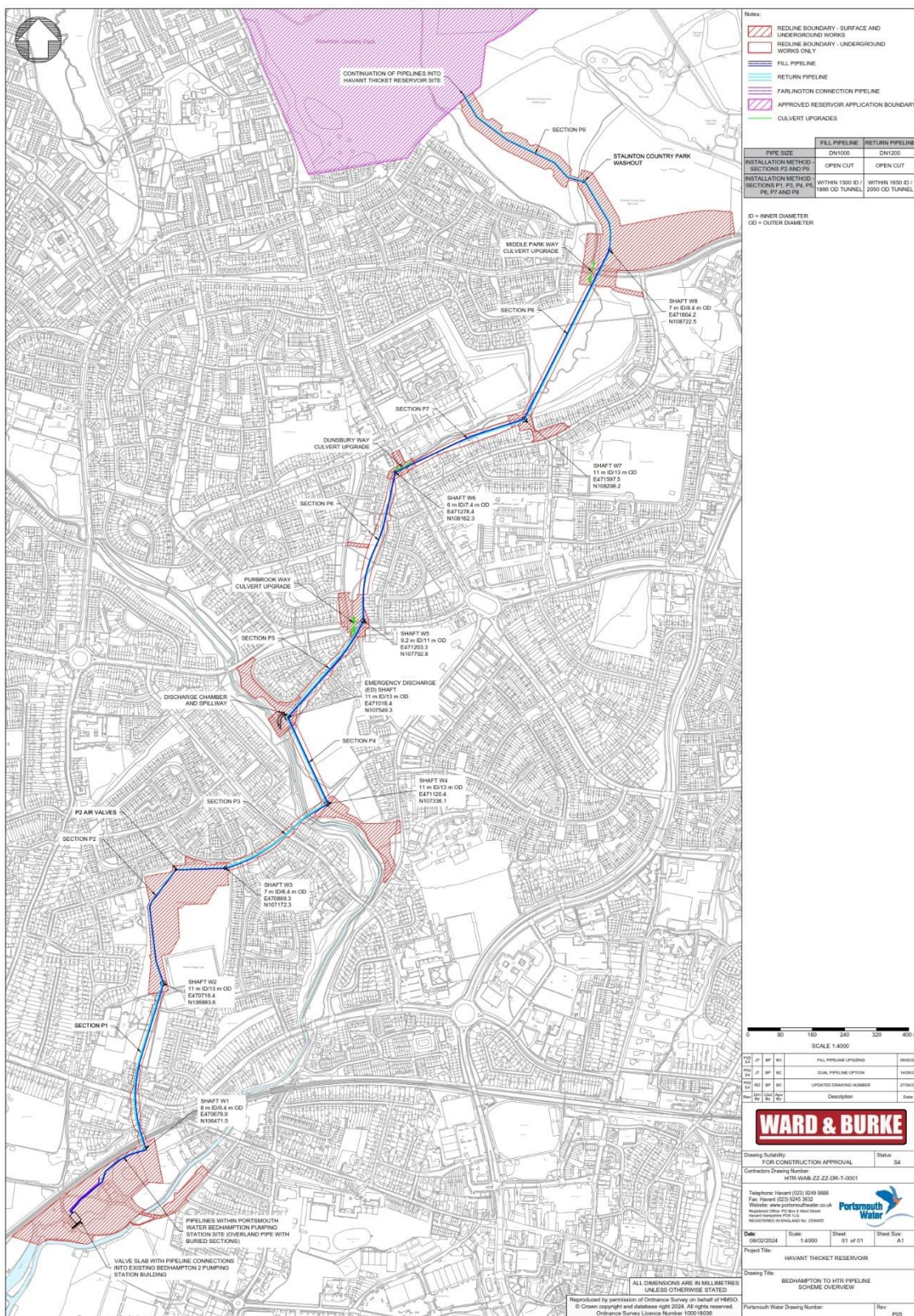
- Identify the environmental risk associated with construction works and determine how they will be managed.
- Identify key staff and their responsibilities regarding environmental management.
- Implement mitigation measures outlined in the Environmental Statement alongside monitoring and auditing requirements.
- Minimise risk to the environment during construction.

9. The contents of this environmental plan are based primarily on the applicable requirements of the pipeline contract and of the following specifications:

BS EN ISO 14001: 2015 Environmental Management Systems.

10. All personnel working on the project are responsible for the environmental control of their own work and shall perform their duties in accordance with the requirements of this environmental plan and in compliance with the procedures referenced therein. No deviations are permitted without the written authority of the Project Director.
11. The Environmental Manager has overall authority for ensuring that the contents of this CEMP are satisfactorily implemented on the project. This person will be responsible for implementation, reporting and monitoring of environmental mitigation during the contract period. Any issues or disputes arising from such should be brought to the attention of the Project Manager and the Project SHEQ Manager and where required, environmental specialists will be consulted to aid in any issues arising from site activities. The key roles for implementing environmental management for this scheme are outlined within this CEMP. Compliance with the project environmental management system and the supporting procedures is mandatory and shall be adhered to by all personnel employed on the project to achieve a common approach to environmental control.

Project Address: Meyrick Road, Havant, PO9 1NR – Main site office.



3 Roles & Responsibilities

12. This section outlines the key roles and responsibilities in environmental management for the duration of the MPW.

3.1 Client Responsibilities

- Review and approve the CEMP, prepared by the contractor, and specialist procedures and identify any areas for improvement.
- Identify the environmental competence of all contractors (and sub-contractors) working on the project. This includes reviewing of CV's and qualifications for all employees relating to environmental works (Environmental Manager, Environmental Clerk of Works, Ecological Clerk of Works).
- Review method statements for environmental aspects and advise of any suggested improvements prior to work starting.
- Auditing all construction activities to ensure that identified and appropriate control measures are effective and in compliance with the CEMP and planning application conditions.
- Act as a main point of contact between the contractor and the client's project team on environmental issues.

3.2 WBCL Responsibilities

3.2.1 Project Director

- To lead by example and champion all areas of environmental management
- Appropriate resources are in place to effectively implement the CEMP and deliver all legal requirements.
- Implement legal requirements where necessary in accordance with contractual agreements with the client and environmental legislation.
- Holds the overall responsibility for HSWE on site.
- Being the day-to-day point of contact for PW.
- Addressing any escalated issues from the WBCL project team.

3.2.2 Project Manager / Site Manager

- To lead by example and champion all areas of environmental management
- Implement appropriate resources to effectively implement the CEMP and deliver legal requirements.
- Ensure that all environmental legal requirements are identified and met.
- Ensure all employees and contractors carry out their duties and responsibilities as defined in this CEMP.
- Undertake (or nominate others to undertake) environmental inspections.
- Monitor environmental performance of the project against statutory requirements, objectives, and targets.
- Identify necessary levels of environmental competence in staff and ensure necessary training is delivered to personnel.

- Manage investigation and resolution of complaints in accordance with the relevant procedure.
- To implement correct procedures in case of an environmental incident.
- Report any environmental incident to the project SHEQ advisor as per PW's 2:2:2 procedure as described in the Construction Phase Plan.
- To act as liaison officer for stakeholders throughout the works
- Supervision of WBCL staff.
- Day to day management of site operations.
- Contributing to the daily and weekly site reports.
- Implementing the safety and efficiency of construction activities.

3.2.3 Supervisors

- Assist the project manager in implementing the requirements set out in the CEMP.
- Fully support any investigation following an environmental incident
- Conduct and document weekly environmental inspections.
- Deliver environmental oriented briefings and Toolbox Talks to the site workforce.
- Implement and maintain environmental controls on site.
- Act on any spills/incidents that occur on site.
- Report any environmental incidents immediately to the project SHEQ or Environmental Advisor
- Report any activity that has potential to have an environmental effect immediately to the project Site Manager.
- Respond and report to any spills/incidents that occur on site.
- Supervision of WBCL staff.
- Implementing the safety and efficiency of construction activities.

3.2.4 Ward and Burke Project SHEQ Manager

- Provide overall advice and co-ordination of all activities relating to environmental matters.
- Provide company environmental support where required.
- Carryout company environmental audit on the project.
- Act as a point of contact for all environmental issues and WBCL environmental specific-deliverable updates.
- Oversee commitments under the REAC and CEMP.
- Preparation, revision, and submission to the client Project Manager of the WBCL CEMP.
- Contribute to monthly progress reporting.

3.2.5 Project SHEQ Advisor

- Advise the Site Manager on legal requirements.

- Supports the SHEQ Manager and the project management team in delivering the environmental component of the works during the construction phase. Undertake environmental management system inspection as set out in sections.
- Implement the use of an accurate Site Waste Management Plan (SWMP) and review its applicability to the site operations.
- Review the CEMP throughout the construction process to monitor its relevance and effectiveness in identifying and managing environmental risks.
- Carry out accurate reporting of resource usage, e.g. energy and water.
- Manage documentation relating to environmental procedures and to update policy where necessary included within the CEMP.
- Manage all necessary documentation to demonstrate compliance with appropriate legislation for the required period.
- Undertake and document noise monitoring.
- Provide environmental training to the project team and workforce when required.
- Co-ordinate and report any environmental incident to the appropriate stakeholders as soon as possible.

3.2.6 Waste Duty Holder

13. Waste Management will be carried out in accordance with the project specific procedure. A Site Waste Management Plan (SWMP) has been produced for this project to ensure the correct treatment of all potential sources of waste from this scheme. A Minimum of two Waste Duty Holders shall be trained and appointed for the duration of the project. Their responsibilities include:
- Ensure Waste Transfer Notes are collated and kept on file for the duration of the project.
 - Where appropriate, ensure sub-contractors method statements include waste disposal methods.
 - Make him/her aware of legislation, codes of practice, guidance notes and good environmental working practice relevant to his work. Take advice from the Environmental Advisor in these circumstances.
 - Carry out audits on subcontractor's waste management practices.
 - Monitor waste on site so it is stored and handled correctly.
 - Check waste is segregated, and skips labelled correctly.
 - Carry out checks on waste carriers and disposal sites to ensure compliance is met.
 - Source to Destination checks on waste.
 - Retain Waste Transfer Notes (WTN) and Hazardous Waste Consignment Notes (HWCN) in waste file for requisite period post-construction.
 - Complete the project waste register.
 - Update the SWMP where necessary as the project progresses.

3.2.7 Employees

- Comply with directions and requirements given in the site induction.
- Proactively approach environmental issues whilst on site
- Report any environmental incidents/near misses immediately to the supervisor or SHEQ Advisor
- Carry out all activities in line with the environmental procedures and requirements detailed in the CEMP.

3.2.8 Sub-Contractors

- Comply with directions and requirements given in the site induction.
- Follow control procedures as instructed within RAMS.
- Contractors working on or visiting the site will be required to attend the site- specific induction. Those participating in, or near to specific activities that have an environmental impact will be required to attend additional training or toolbox talks. Contractors that do not attend site induction will not be permitted to access the site.
- Carry out all activities in line within environmental procedures and requirements detailed in the CEMP.
- Report any environmental incidents/near misses immediately to the Project Manager or SHEQ Advisor.

3.2.9 Environmental Clerk of Works/Environmental Manager (EnvCoW)

General

- An EnvCoW will be present on site overseeing any environmentally related matters and to ensure work is undertaken in accordance with the CEMP, environmental legislation and all permits, consents, and licences.
- Aid in preparing documentation for all work activities where there is a risk of environmental damage.
- Liaising with the Client Project Manager and client Environmental Manager in reviewing and updating the Control Measures for all works activities where they have been altered, and
- Being familiar with the contents, environmental commitments and requirements contained within the Reference Documents and Regulatory Requirements section.
- Undertakes day to day monitoring and supervision of construction activities in relation to environmental aspects on site to ensure identified mitigation measures are adhered to and corrective action is taken, as necessary.
- Being familiar with the baseline data gathered during the Environmental Appraisal and pre-construction surveys e.g. EPS surveys, watercourse crossings, CAR licencing etc.
- Listing all environmental commitments and requirements to the Client Environmental Manager.
- To ensure a competent and trained Ecological Clerk of Works (ECoW) is on site when required. An Ecological Clerk of Works will be required on site for works relating to any vegetation clearance or works involving the encroachment of water bodies. The ECoW will support in:
 - Advising on the protection of ecological features and mitigation measures.
 - Undertaking pre-construction and construction phase species checks.
 - Conducting ecological watching briefs e.g. during grass strimming/ vegetation clearance.
 - Undertaking the translocation of flora and fauna.

Licensing

- Liaise with the PW Planning and Consents Lead to ensure that all relevant works have (and are being carried out in accordance with) the required permits, licenses, certificates, planning permissions, etc; and
- Bringing to the attention of the project team any timing and legal constraints that may be imposed on the carrying out of certain tasks.

Legislation

- Complying with environmental legislation that may affect environmental management during the construction phase.
- Ensuring that environmental staff have an awareness and working knowledge of environmental legislation, environmental standards, and guidance relevant to the construction activities to which they are engaged.
- Key legislation can be found in the appendices of this document (Appendix B).

Site environmental inspections

- Carrying out regular documented inspections/audits of the site to ensure that all work is being carried out in accordance with the REAC requirements outlined within the CEMP and CMS.
- Quarterly ecological progress reports to be provided to LPA during construction as required in the REAC table under the biodiversity actions (Pipeline B1).
- Records the progress of the environmental works.
- Identifies key environmental concerns on site as the Scheme develops. Undertake site inspections with the SHEQ Manager and/or project management team.
- Assesses and checks survey results and update databases, environmental plans as required.

Specialist environmental contractors

- Liaising with the Client Environmental Manager to Identify requirements for specialist environmental contractors before commencement of the project.
- Reviewing any specialist environmental contractors for competency and have sufficient expertise to co-ordinate and manage environmental issues and managing their activities on site. Competent Environmental/Ecological Contractors will be selected using our Sub-Contractor Vendor Approval system, ensuring they are qualified and competent for the task they are undertaking. Skills, Knowledge, Attitude, Training and Experience (SKATE) will be taken into consideration.

Environmental Induction Training and Environmental Toolbox Talks

- Ensure Environmental Induction Training is carried out for all site personnel under the Contractor. The induction training may be carried out in conjunction with Safety Induction Training. TBTs will be presented to staff involved in activities that have an environmental impact. TBTs will be delivered by a relevant competent person and will be relevant to the tasks being undertaken. For example, ecological TBTs for works affecting species and habitats

will be delivered by the Ecological Clerk of Works (ECoW). Key environmental issues will be posted on the site notice board. Section 4.5 contains further details of inductions and toolbox talks.

- Inputs and reviews site specific method statements to ensure appropriate environmental mitigations are in place for each construction activity.

Environmental Incidents/Spillages

- Ensuring the Client Environmental Project Manager is notified of all incidents where there has been a breach of agreed environmental management procedures; where there has been a spillage of a potentially environmentally harmful substance; where there has been an unauthorised discharge to ground, water or air and where there has been damage to a protected habitat, etc.
- Be ready to assist in always implementing an Emergency Response Plan.
- Be responsible for notifying the relevant statutory authority of environmental incidents; and
- For carrying out an investigation and producing a report regarding environmental incidents and non-conformances. The report of the incident and details of remedial/corrective action actions taken should be made available to the Client Environmental and Project Managers
- PW's 2:2:2 incident procedure is to be followed if Environmental incident or spill occurs (Please see 4.10 of this document).
- Statutory authority/regulator are to be informed to ensure appropriate measures/responses are taken in relation to the incident in accordance with legislated requirements.

3.3 Register of Environmental Actions and Commitments (REAC)

14. The REAC identifies environmental actions and commitments made during the outline design to mitigate the potential environmental effects of the Scheme. The REAC includes the mitigation and compensation, management and monitoring measures that informed the environmental impact assessment reported in the Environmental Statement (ES). The REAC table for the Main Pipeline Works can be found in Appendix A.

4 Project Environmental System

4.1 Project Environmental Management System Documentation

15. This section describes the Environmental Management System (EMS) complying with BS EN ISO 14001, that will be established to control the activities to be undertaken during the project. It defines and documents the projects objectives, policy, and commitment to environmental control.

4.2 Environmental Planning

16. The Project documentation has been reviewed to determine the environmental requirements. A project environmental review will be undertaken monthly as part of Environmental Sub-Group Meetings to evaluate and facilitate control of the environmental effects of the project in accordance with Ward and Burkes Environmental Management System.
17. The review will as a minimum include the following:
- Identification of any environmental requirements not covered in the existing environmental control procedures and the preparation of Project specific environmental control procedures to be updated within the CEMP.
 - Applying environmentally sustainable practice in line with the EMS and contract requirements when carrying out construction works.
 - Identification and acquisition of any equipment, resources and skills that may be needed to achieve the required standard of environmental control and sustainability.

4.3 Document Control

18. Document control procedures ensure that all correspondence, drawings, and technical data received are recorded, distributed, filed, and archived in an efficient and controlled manner. Control activities exercised on the documentation shall include the following:
- Review of documents and drawings prior to release to ensure that requirements are clearly stated and that they are authorised for issue.
 - Identification of documents to be controlled.
 - Review and approval of changes to documents and drawings.
 - Control of documents, including approved changes to preclude inadvertent use of obsolete or superseded documents.
19. Standard methods shall be defined for adding and identifying revisions. Where practicable, the nature of the change shall be identified in the document or the appropriate attachments. All documents shall be re-issued after several changes have been made.

4.4 Training, Awareness and Competence

a) Project Inductions

20. The Project SHEQ Manager/Adviser will identify and arrange environmental induction sessions as necessary for Project personnel. The project EnvCoW will also ensure specific TBTs are given during the whole project. During the project induction, the requirements of this environmental plan will be explained and discussed as well as any changes to the normal method of working which have been identified for the project. Ongoing induction requirements will also be identified during facilitation audits. The site induction will include information relating to the environmental aspects identified on the project such as:

- Potential archaeological finds
- Waste management and segregation.
- Spill response.
- Refuelling
- Noise
- Environmentally sustainable practices
- Plant, equipment requirements.
- Biodiversity – Birds, Badgers, Bats, etc.
- Invasive plant species
- Tree and hedgerow protection
- Water borehole protection.
- Watercourse protection

b) Environmental Training

21. The Project Manager will ensure that in accordance with the SHEQ Training Matrix all environmental training requirements are identified and a training programme developed.

Toolbox Talks

22. All site personnel and visitors are to receive Site Safety induction and Environmental Awareness training from the Ward and Burke before commencing activities on site. The list below is not exhaustive but environmental training at Induction and through toolbox talks will at least include the following:

- Company/Project Environmental Policy.
- Site environment.
- Fuel containment.
- Earthworks and Excavations (Risks of exposing contamination).
- Pollution protocol and measures for example use of spill kits.
- Defined Materials Storage area (excavated and imported).
- Defined waste areas - Domestic and construction materials.
- Wheel wash – road sweeping.
- Dust and emissions control.
- Tree and hedgerow protection on site (establishing exclusion zones where necessary)

- Noise control.
- Vibration control.
- Site traffic protocols and routes in the form of a Traffic Management Plan – haul routes, staff travel to site plan.
- Warning signs.
- Site inspection and monitoring forms.
- Material procurement.
- Toolbox talks where relevant to specific works (e.g. works near Japanese Knotweed, working with Bentonite, dust control, working around trees and hedgerows.)
- Communication Systems on site – dealing with the public, incident and near miss reporting inclusive of environment.
- Site organisation, key personnel responsibilities, and contact details.
- Emergency Response Plan(s) for addressing Safety and Environmental issues.
- Contamination risk management.
- Update and maintain site specific toolbox talk or advisory sheets relevant to the project.

Spill Response Preparedness

23. The project will ensure a spill response exercise and spill response training is completed and records maintained (and retrievable) on a six-monthly basis. This exercise will comprise of a desk top study or a mock spillage event. Learning outcomes from the exercise should be documented and actions raised if required. All personnel will be made aware of the spill response procedure and reporting requirements through the induction process, toolbox talk briefings. An Emergency Response Plan and a Pollution Management and Mitigation Plan (PMMP) will be developed for the main pipeline works of this project. The Emergency Response Plan will detail the procedures to take place in the event of an emergency within works. WBCL will produce a PMMP detailing how the organisation will protect surrounding environment in the event of pollution resulting from construction activity. These ranges from noise to the local residents, traffic and machine movement that could negatively impact the landscape, flood risk during the reservoir works, construction dust etc. This guidance will respond to the hazardous substance, oil, sewage spills that may threaten or impact ground, surface, or piped stream waters. The Plan is designed to promote timely and effective response to spill events and the likely pollution that could affect the area. It summarizes procedures, policies, and responsibilities for assessing, mitigating, cleaning up, and following up on spills, and for recovering costs for impacts to natural resources. It also clarifies the responsibilities and required responses with respect to the water quality-related aspects of a spill incident, thereby enhancing coordination among the local council, and Environment Agency and other responders. Works will be carried out in accordance with the Best Practicable Means, as defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environment Protection Act 1990 (Appendix B), and noise control measures, as suggested by BS 5228 Part 1.

Training Records

24. Records of all training carried out on the project (including Induction) will be retained and made available for viewing during environmental audits if required. Ward and Burke's direct employee's training records will be retained within the Company Training Matrix. Sub-Contractor's training records will be retained within the Project's SharePoint file structure. Access to this folder is to be controlled by Ward and Burke's Project Manager, Site Manager and SHEQ Manager.

SEAT Training

25. Site managers and Supervisors will attend the one-day CITB SEAT (Site Environmental Awareness Training). This course is aimed at staff with management or supervisory responsibilities on a construction site, including site managers, site supervisors, site foreman, site agents and those with design or purchasing responsibilities. The SEATS training course will provide employees with an introduction to environmental issues on construction sites and has been designed to provide the basic environmental knowledge.

Subcontractor Competency and Vendor Approval

26. All Subcontractors employed by the project must be appointed in line with the Project Procurement Plan.

4.5 Internal Communication

27. Environmental SHEQ Alerts and bulletins are distributed by the SHEQ/EnvCoW Department as required to key staff including site management to keep them informed of environmental issues such as learning events from incidents/ accidents or new legislation. Poster campaigns will be launched from time to time to raise awareness and keep staff informed of environmental issues within the company.
28. All project personnel are encouraged to make suggestions for environmental improvement and report environmental problems. In this instance Ward and Burke have various procedures that can be used including open door policy, hazard reporting, STOP/STAR awards, daily briefing and consultation, and formal environmental incident reporting forms. The project's environmental issues arising from site environmental reports, corrective action notices or audits are discussed at site meetings as well as monthly Health and Safety meetings and actions apportioned accordingly.

4.6 Monitoring and Audits

➤ In-Process Monitoring

29. Where required on the Project, environmental monitoring will be carried out in accordance with requirements outlined within the REAC, as well as the relevant SHEQ Procedures and Risk Assessment Method Statement (RAMS) for each specific phase of the works. The Project SHEQ Team will ensure that all relevant documentation is correctly completed and retained by the project. The project EnvCoW will also monitor the works and produce Environmental Specific reports for the Client and relevant stakeholders. The clients Project Manager will instigate regular audits which will include the review of the monitoring, recording, and reporting procedures being maintained by the PC. Records of environmental monitoring will be held at the PC's site office and will be available for inspection by representatives from the client's audit team and the EA.

➤ **Environmental Audits - Project Environmental Inspections**

30. Environmental inspections of the project will be scheduled weekly and environmental audits will be carried out monthly and the results recorded on checklist provided in the appendices (Appendix D). Daily monitoring will be carried out for air quality on site as required within the REAC (AQ1) in line with contractual requirements:
- Monitoring of noise and vibration levels are to be carried out when works are close to sensitive receptors, with frequency and locations to be agreed with the local authority as outlined with the REAC (Pipeline NV6)
 - Daily site inspections are to be carried out by the EnvCoW within areas with communities and ecological receptors that are sensitive to dust. Daily dust inspection logs are to be made available to the local authority when requested.
 - Daily recording of weather (wind direction, temperature, precipitation) will be carried out.

➤ **Compliance Environmental Audits**

31. A planned programme of compliance audits shall be scheduled to verify the effectiveness project's environmental management system. Audits undertaken must be carried out in accordance with BS EN ISO 19011:2011 as per contractual requirement. The purpose of these audits includes:
- Ensuring that the environmental management plan is being adhered to and that the relevant documentation is being completed.
 - Ensuring that progress towards environmental objectives and targets is being monitored.
 - Ensuring that legislation and/or other requirements are being complied with.
32. Audits are to be scheduled using a risk-based approach, ensuring that all key activities are audited at a time and frequency appropriate to the significance of the activity under review. Audits are to be made available to the client Project Manager within ten days of the completion of the audit. Findings of audits must be analysed accordingly and record any corrective actions to be undertaken.
33. Client Environmental audits are to be carried out by the Client Environmental Manager. The Client Environmental Manager will undertake frequent inspections of works and working areas. Each inspection will include a review of environmental best practice across each of the Environmental topic areas. During initial meetings after Contractor appointment, the Client Environmental Manager will work with the Contractors Environmental Managers to develop and agree a common site inspection/audit checklist. This common approach will then be utilised by both the contractor and client for separate and joint inspections. A joint site inspection shall be arranged to take place as a minimum monthly. The findings of site inspections shall be shared, and best practice celebrated/disseminated, as well as corrective actions identified.
34. The audit report shall make recommendations for improvement and identify the appropriate personnel and timescales for completing these actions. The contents of the report shall, if necessary, be discussed at site meetings. If a complete failure or absence of a required EMS element is discovered during the audit, a major non-conformance will be raised. The project will have 7 days from the date of issue of the audit report to recover the situation and put measures in place to prevent its re-occurrence. If an area of weakness is identified when an element of the system is not being carried out correctly then a non-conformance will be raised, and the project will be given one month from the date of issue of the report to rectify the situation. Ward and Burke representatives shall be afforded full access to accompany auditors during the audit, and a copy of the audit report shall be made available for their review. If deemed necessary, an investigation shall be instigated, and corrective

action taken. The effectiveness of any resultant actions carried out will be assessed by the project at an appropriate time scale.

4.7 Environmental Objectives

35. Ward and Burke annual Environmental Objectives and targets will be adopted and must be displayed on site notice boards and personnel on site made aware of their contents. Projects shall also comply with any client objectives and targets set.

Objective	Target	Measure
Waste Minimisation	90% of waste to be diverted from landfill	Waste hierarchy to be implemented across the project lifecycle.
Maximise use of site won material	Recover 90% of site won material where practicable.	Material Management Plan
Sustainable Materials	100% of the key materials (timber, concrete and aggregates) to be sourced from sustainable sources.	Procurement Management Plan

Table 1 – Ward and Burke Environmental Objectives

4.8 Incident Reporting

36. All environmental incidents will be reported as per the Ward and Burke environmental incident reporting procedure, and PW's 2:2:2 incident procedure as described in the Construction Phase Plan Incident Reporting Procedure. An outline of this reporting procedure includes:
37. All Health and Safety or Environmental incidents or accidents resulting in either injury, damage, polluting event, contamination, dangerous occurrence or 'near misses' must be logged on to the company incident reporting system by the site agent/manager. This will be reported to the SHEQ Advisor/Manager immediately and where considered necessary will be investigated by WBCL.
38. All accidents and incidents will be in accordance with the WBCL escalation procedure, and will be following Portsmouth Water's 2-2-2 reporting procedure:
- 2 Hours to notify HTR Health and Safety Manager by phone or email or within 1 hour if Environmental Incident occurs.
 - 2 days for the Investigation to be sent to relevant department (H&S or Environment team)
 - 2 weeks for further investigation and an EIR if required.
39. Spillages of considerable volume or substances other than hydrocarbons or silted water will be communicated to the SHEQ Advisor via telephone as soon as possible. The SHEQ officer can also be contacted via email, although should only be used as a follow up. Any environmental pollution in rivers or streams must be immediately reported to Head of SHEQ, Project Director and Project Manager. In the event of a spillage, action is to be taken by following the outlined procedures detailed in the PMMP.

4.9 Communication with Statutory Bodies

40. In the event of the Environment Agency coming to site to inspect the works, Ward and Burke are to comply with their requirements and Portsmouth Water will be informed in advance of the Environment Agency coming to site. The HTR Project Manager and Portsmouth Water Environment Manager will be informed as a priority. Attendance of PW is not mandatory, but it will be communicated to PW if WB think it to be required.
41. If routine, or emergency communication is required with other Regulatory Bodies, Ward and Burke are to discuss with Portsmouth Water the process and procedure of the communication. Document and information sharing is to be agreed upon prior to contact being made.

4.10 Noise Monitoring Duty Holders

42. Suitably trained personnel will carry out noise monitoring to confirm compliance with the Noise and Vibration Impact Assessment (HTR-ATK-ZZ-ZZ-RP-Z-0112) and Noise & Vibration Management Plan (HTR-WAB-PI-ZZ-PL-W-0005). Daily Monitoring will be planned to take account of site activities that are likely to generate high noise levels, (e.g. breaking concrete) and be measured local to the activity as well as at recognised locations in the Planning Conditions and Client requirements. Throughout this project, WBCL shall monitor specific areas of concern, which are at most at risk of disturbance. Noise monitoring will be carried out by the EnvCoW using handheld noise monitoring devices which will record noise at specific locations daily to assess the noise impact during particular activities. Peak noise monitoring will be carried out which focuses on capturing the highest levels of noises from particular activities such as piling, and excavation works. For construction activities, the document BS 5228-1:2009 suggests that noise levels should not exceed 70 dBA in rural, suburban, and urban areas away from main roads and 75 dBA in urban areas near main roads between 07:00 and 19:00 hours. Records of noise monitoring are to be stored in paper and electronic format and made available within the site offices.

5 Project Environmental Controls

43. The following activities will be carried out during the Main Pipeline Works, and they have been identified as having significant environmental aspects as outlined in the REAC table.

- Waste Management
- Handling and Storage of Materials
- Spill Response and Emergency Preparedness
- Nuisance
- Noise and Vibration
- Dust
- Air Quality
- Water Discharges
- Piling Operations
- Flora/Fauna
- Biodiversity
- Invasive Non-Native Species (INNS)
- Energy Consumption and Minimisation
- Traffic Management
- Historic Environment
- Population and Human Health
- Major Accidents and Disasters
- Ground Condition Impact
- Effects on Climate

5.1 Materials and Waste Management

5.1.1 Introduction

- 44.** Construction works are anticipated to generate in the region of 32,000m³ of excavation arisings. At present, approximately 5,050m³ of the arising are proposed to be retained on the project for re-use as general backfill and in re-instatement of the proposed shafts and open trenches.
- 45.** Under current waste legislation, these arisings would constitute waste unless it can be demonstrated there is no requirement or intention to discard and could remain a waste until demonstrated they cease to be such.

5.1.2 The Waste Hierarchy

46. The foundation for waste management is the five-step waste hierarchy of the EU¹ Waste Framework Directive (WFD) 2008/98/EC, which establishes an order of preference for managing and disposing of waste where preventing waste is the preferred option and sending waste to landfill is the last resort.



Figure 2 - Waste hierarchy.

5.1.3 Site-won Material Re-use

47. Re-using soil arisings is a more sustainable approach to disposal, reducing haulage requirements and minimising disposal costs. However, an Environmental Permit, Environmental Exemption (U1) or Material Management Plan (MMP) prepared in accordance with the CL:AIRE Definition of Waste Code of Practice² (CL:AIRE DoW CoP 2011) may be required where applicable to enable re-use of chemically and geotechnically suitable excavation arisings in accordance with the current waste regulatory framework. Any requirements under planning should also be considered.
48. Where re-use is proposed, this should be confirmed by the appropriate regulator (Environment Agency Local Waste Officer and Local Authority), with the re-use mechanism established and implemented before works commence.
49. A review of ground conditions, field observations and analysis (chemical and geotechnical) should be followed. Good practice is detailed in CIRIA publication C809 (2023) Sustainable Management of Surplus Soil and Aggregates from Construction and DEFRA's Construction Code of Practice for the Sustainable use of Soils on Construction Sites (September 2008).
50. Excavation arisings unsuitable for re-use or surplus to requirements will be removed from the project as detailed in **Section 5.2**.
51. Any wet excavated material will be allowed to dry out to a level suitable for transport prior to removal from site. In the unlikely event that any residue/dirt is deposited on the roads a road sweeper will be used to clean the road and the water/muck from the sweepers will be tipped at the licensed sweepers facilities.

¹ The UK left the EU on 31 January 2020, however, English legislation which implements requirements of EU law such as the Waste Framework Directive remains in force and has been largely unaltered.

² CL:AIRE (2011) The Definition of Waste: Development Industry Code of Practice, Version 2, March 2011.

5.2 Waste Management

5.2.1 Site Waste Management Plan

52. The project will ensure that all legal requirements for waste shall be complied with. Ward and Burke will manage waste generated from our operations and collate all relevant waste disposal documentation. A Site Waste Management Plan will be developed for site.
53. The Site Manager and SHEQ advisor shall monitor the segregation of the waste on site and carry out the relevant checks on waste carriers, waste disposal destinations and ensure the correct completion of all waste documentation. All waste generated shall be placed within the appropriate skips/containers for disposal. Waste segregation will be achieved via separate suitable containers, lidded where appropriate and labelled. All waste containers will be stored on an impervious surface and within the designated area as shown on the Site Layout Plan. This designated area will be located away from environmentally sensitive areas on site such as drains and watercourses. The area around the skips will be kept tidy and full skips will be removed from site as soon as is practicable, ensuring there is no over-storage of waste on site. The following waste streams will be segregated on site:
- General (including office and canteen waste)
 - Wood
 - Metal
 - Paper and Cardboard
 - Spoil
 - Bricks and rubble
 - Redundant cabling
 - Plastic
 - Glass
 - Sewage
 - Concrete
 - Hazardous Waste/COSHH
54. All hazardous/special waste produced on site will be double-bagged and labelled with the contents placed within a suitable labelled and lockable container for storage. All hazardous/special waste will be removed from the site by appropriate waste contractors or the responsible subcontractor and be disposed as per relevant waste legislation and in accordance with the SWMP. The Waste Duty Holders will ensure that all documentation is completed prior to disposal. The following hazardous/asbestos wastes may be created on site:
- Batteries
 - Paint tins (containing liquid paint or non-water-based paint)
 - Aerosols
 - Oily rags
 - Used spill response materials.

- Asbestos

55. A register of all waste removed from the site will be kept along with waste documentation and held by the SHEQ Advisor. The register will detail dates, subcontractors, quantity of waste as well as end use (recycled, re-used or to landfill). The project will introduce a waste minimisation strategy in accordance with the requirements of the SWMP. Where practicable, the quantity of waste arising will be minimised, and materials re-used either directly or indirectly where possible. Imported packaging waste produced by the project will be recycled where applicable. Audits of all subcontractors will be undertaken on a six-monthly basis as a minimum. All documentation relating to the transfer and disposal of waste (i.e. waste transfer notes and hazardous/special waste consignment (Trans frontier Shipments)) shall be maintained on the project for the documented period. Any sewage, from temporary toilet facilities that need to be provided during any phase of the contract, will be disposed of via licensed sewage removal contractors. Local legislation is as follows:
 - **Hampshire Minerals and Waste Plan 2013** - *The Plan establishes Hampshire's strategy for managing minerals and waste. It sets out 34 policies relating to minerals and waste, these include the safeguarding of mineral resources and infrastructure sites, ensuring an adequate supply of aggregate, maximising recycled and secondary aggregate production and the sustainable management of waste. The Plan defines the MSAs in Hampshire. In addition, the Plan states that a key objective is to maximise the reuse, recycling and recovery of construction, demolition, and excavation (CDE) wastes. For non-hazardous waste, it sets targets for 60% to be recycled and 95% to be diverted from landfill by 2020. A review of the Plan in 2020 concluded that a partial update was required to ensure full compliance with NPPF and the NPPW. A Draft Plan Consultation was run between November 2022 and January 2023, with an updated Plan still to be published, the Scheme will consider the current Hampshire Minerals and Waste Plan 2013.*

5.2.2 Waste Classification Assessment

56. The project is understood to require disposal of approximately 27,000m³ of unsuitable or surplus excavation arisings. It is a legal requirement to assess wastes potentially to be discarded i.e. waste for disposal off-site.
57. An assessment of the likely disposal classification of potential wastes will be undertaken by a waste management specialist in accordance with the current waste regulatory framework.
58. Following selection of the appropriate potential List of Waste (LoW) codes for the materials encountered during the investigation, a hazardous properties assessment (Environment Agency Technical Guidance WM3³) will be undertaken using the industry recognised HazWasteOnline™ screening tool; a web-based software tool for classifying waste that follows the latest Environment Agency guidance and European regulations.
59. In accordance with the principles of the waste hierarchy (Paragraph 56), wastes should be diverted from landfill to appropriately licensed waste processing, treatment, or recovery facilities within the region. Opportunities should be sought where possible to re-use suitable arisings on other local construction projects or developments.

5.3 Handling and Storage of Materials

60. Any COSHH items used during the project must be evaluated for environmental risk and potential threat to the environment by referring to the Safety Data Sheet (SDS) that accompanies the product. COSHH items refer to substances that are hazardous to health. Substances can take many forms and include:
 - Chemicals
 - Products containing chemicals.

³ Environment Agency, Technical Guidance WM3, Guidance on the classification and assessment of waste, 1st Edition v1.1.GB (Jan 2021)(EU Exit Update)

- Fumes.
 - Dust.
 - Vapours.
 - Mists.
 - Gases and asphyxiating gases.
 - Biological agents.
61. Designated areas shall be established for the storage of all materials, plant, and equipment. Designated areas are to be clearly identified and documented on the site compound drawings for each work area across the scheme. Materials will be stored in accordance with the manufacturer's instructions and protected from accidental damage. Storage of materials that could cause a risk to water quality, including fuels and chemicals, will be stored as far away from water sources as reasonably practicable and within a secondary bund if required. A high level of housekeeping will be maintained which involves a high level of tidiness and cleanliness within all storage areas. Storage containers will be clearly labelled with their contents and a basic inventory produced. All storage locations, machinery, equipment, fuel stores, chemicals and temporary buildings will be located to limit adverse environmental effects and all sensitive areas (Rail Track, Springs, Water course etc.) close by will be protected. Heras fencing will be constructed around storage areas to mitigate against any unauthorised access and act as a visible deterrent.
62. Diesel and oil will be delivered to site and stored in compliance with regulations⁴ and the relevant SHEQ procedure/guidance note. Larger quantities of over 200 litres will be stored in a double skinned container, not a single skin tank, with a separate bund. If smaller quantities of diesel or oil are required to be stored on site, they will be stored in approved labelled containers and securely located within a bunded area or drip tray. Bunded areas shall be capable of holding 110% of the stored container or, if multiple containers, 25% of the largest container. Fuel storage areas will be located away from watercourses and drains (a minimum of 10 metres). Bunded areas will also be stored on impervious surfaces and all hoses, valves and triggers will always be stored within the bund. Bunded areas must be located to prevent protection from accidental damage (particularly from vehicles) or acts of vandalism. Great care must be taken when refuelling mobile plant and equipment to prevent spillages. Refuelling will only take place in a designated area with a fire extinguisher and a spill kit in the immediate vicinity. Only a competent and authorised person, identified in task specific RAMS, will undertake refuelling.
63. Where practical, new equipment should be delivered already filled with oil. If oil needs to be removed from old equipment, this will be done so in a controlled manner, which will be outlined within task specific RAMS. All mobile plant (unless it has an integral drip tray) will have drip trays positioned beneath it when stored. Additional drip trays and spill kits will be provided near plant to contain any leaks should they occur, to ensure immediate emergency protection is available. Drip trays will also be used when refuelling or breaking containment in equipment or pipelines. Contents of drips trays and waste oils are to be decanted into storage containers, such as interceptor trays, which will be stored in a hard standing area. Under no circumstances should drip trays be emptied into the drainage system.
64. Any other substances hazardous to health which are to be used on the project will be stored in the designated area only and will be handled correctly i.e. by using appropriate containers and in accordance with the appropriate COSHH Regulations 2002 (Appendix B). The level of hazardous substances to site personnel must not exceed occupational exposure standards and maximum exposure limits stated in the current version of the HSE document

⁴ *Oil storage regulations for businesses* (no date) GOV.UK. Available at: <https://www.gov.uk/guidance/storing-oil-at-a-home-or-business> (Accessed: 02 May 2024).

(EH40: Occupational Exposure Limits). Substances and chemicals handled/stored by subcontractors shall be monitored and COSHH assessed for any hazardous substances to ensure compliance with contractual requirements and company procedures, i.e. appropriate method statements, COSHH sheets available, preventative measures against spillage's, etc. Compliance against these requirements will be checked as part of the weekly environmental inspection and the results recorded. These inspection forms will be reviewed during formal environmental audits.

5.4 Spill Response and Emergency Preparedness

65. As polluting materials will be stored and used on site, an adequate number of spill response measures will be provided. Works will be carried out in accordance with the CDM Regulations (2015) (Appendix B) and in accordance with the Emergency Response Plan and Pollution Mitigation and Management Plan (both to be developed subject to planning). Spill response stations will be available on all site compounds across the scheme in the case of accidental release. In addition, all plant used on this project will carry a 25-litre spill response kit on board. An emergency flow chart for environmental spillage has been developed within the onsite Emergency Spill Response Plan. This flowchart will be introduced as part of the SHEQ Induction and will be displayed around the site to ensure appropriate spill response and emergency preparedness measures are followed to prevent and mitigate further damage due to accidents and/or incidents are communicated. The flow chart will include the following details:

- Contact names and numbers.
- Emergency response actions.

66. Compliance against these requirements will be checked as part of the weekly environmental inspections and the results recorded. This inspection checklist will be reviewed during formal environmental audits.

5.5 Nuisance

67. Nuisance under the Environmental Protection Act 1990 (Appendix B) include:

- Noise from premises or from vehicles, equipment, or machinery in the street.
- Smoke from premises.
- Smells from industry, trade, or business premises.
- Artificial light from premises.
- Insect infestations from industrial, trade or business premises.
- Accumulation or deposits on premises (e.g. piles of rotting rubbish)

68. For the issue to count as a statutory nuisance it must do one of the following:

- Unreasonably and substantially interfere with the use or enjoyment of a home or other premises.
- Injure health or be likely to injure health.

69. Mitigation shall be implemented to prevent the occurrence of any nuisances arising because of any activities on the Project by ensuring that all staff and operatives are briefed on the requirement to minimise nuisance from site activities via toolbox talks. A complaints procedure will be implemented on the project and contact numbers being communicated to all personnel and displayed on office notice boards. In the event of an environmental nuisance complaint being received, these must be logged on the complaint register and where required corrective measures undertaken. The complaints register will be reviewed during formal environmental audits.

On-site monitoring will be carried out by the EnvCoW to ensure mitigation measures outlined in toolbox talks relating to 'nuisance' are being followed, as well as ensuring mitigation measures outlined in the Noise and Vibration Impact Assessment (HTR-ATK-ZZ-ZZ-RP-Z-0112) are adhered to.

5.6 Noise and Vibration

70. The project shall implement mitigation measures outlined in the Noise and Vibration Impact Assessment (HTR-ATK-ZZ-ZZ-RP-Z-0112) and from the Noise and Vibration Management Plan (HTR-WAB-PI-ZZ-PL-W-0005) to ensure that the noise emitted from all equipment, operations and services used during the project will be practically minimised in line with the recommendations of BS 5228-1(Code of practice for noise and vibration control on construction and open sites. Noise), clause 9.3 to minimise noise levels during the works. All vehicles, plant and machinery used on site will be maintained in efficient working order to minimise any potential excess noise produced. Mobile plant is to be sited as far away from sensitive receptors (e.g. residential areas, main roads) as reasonably possible. In general site management will consider the following noise hierarchy:

- Eliminate the source of the noise.
- Substitute for quieter methods of working.
- Isolate source of the noise.
- Engineering controls, i.e. barriers, silencers, insulation.
- Restriction of working hours.

71. A Noise and Vibration Impact Assessment has been carried out for the Main Pipeline Works (HTR-ATK-ZZ-ZZ-RP-Z-0112) which includes information relating to the shaft and tunnelling construction works as well as open cut trench works.

Pipeline Shaft	Duration of Works (days)	Potential Impacts (residential)	Potential Impacts (non-residential)
Shaft 1	213	19	1
Shaft 2	381	21	2
Shaft 3	132	73	0
Shaft 4	429	25	0
ED Shaft	279	45	0
Shaft 5	447	82	1
Shaft 6	185	74	0
Shaft 7	514	58	0
Shaft 8	135	3	0
Culvert Middle Park Way	74	15	0
Culvert Dunsbury Way	68	65	0
Culvert Purbrook Way	88	46	1

Table 2 - Sensitive receptors affected by shaft, tunnelling, and culvert works.

Pipeline Section	Duration of Works (days)	Potential Impacts (residential)	Potential Impacts (non-residential)
Bedhampton	340	19	1
P2	100	78	2
P9	177	0	0
Reservoir Pipeline Section	312	18	0

Table 3 - Open cut sensitive receptors.

72. Ward and Burke and contractors will adopt mitigation measures supported by the Noise and Vibration Impact Assessment (HTR-ATK-ZZ-ZZ-RP-Z-0112) to mitigate effects on sensitive receptors, including but not limited to the following:

- All mobile plant and equipment will be fitted with acoustic panels that will be kept closed whilst running.
- All mobile plant and equipment will be switched off when not in use.
- All equipment will be well maintained, including dampers and silencers.
- Faulty equipment will be removed from use.
- Restrict the number of vehicles allowed on site.
- Only plant which complies with the relevant EU/UK noise limits applicable to that equipment or is in no way noisier than would be expected from the noise levels quoted in BS 5228: 2009+A1:2014 Part 1 will be used.
- Using vibration-generating equipment at the minimum vibration amplitude where practical.
- Where practicable, using a 'dead rolling' method when vibratory rollers are required for compaction activities, which involves not applying the vibration system on the rolling equipment.
- Ensuring that all staff and operatives are briefed on the requirement to minimise nuisance from site activities via toolbox talks. Polyfan/PCT grinding and cutting discs will be used, where appropriate, that allow up to four times the exposure to both vibration and noise over conventional discs. Regular noise surveys including octave band analysis, where appropriate, will be undertaken throughout the works, during grinding, drilling and other noise generating activities.
- Any equipment/plant that appears to be generating high noise levels will be checked for any potential defaults by a competent plant fitter/mechanic and removed from site if found unsuitable. Alternative plant/equipment will be investigated for suitability to carry out the work if required.
- If noise limits have been set by the Local Authority or Client mitigation measures to achieve these desired noise limits will be updated within this CEMP Compliance with these requirements outlined in the Noise & Vibration Impact Assessment (HTR-ATK-ZZ-ZZ-RP-Z-0112) will be checked as part of the weekly environmental inspection

and the results recorded. This audit checklist will be available in the site offices and will be reviewed during formal environmental audits.

- Noise suppressing screens to be implemented around known areas where site noise may be of concern as outlined within the REAC table (Appendix A) and the Noise & Vibration Impact Assessment (HTR-ATK-ZZ-ZZ-RP-Z-0112). For the pipeline corridor, construction noise impacts are expected at sensitive receptors located in proximity to Shafts 2,3,5,6,7, and the Emergency Discharge chamber. Noise suppressing screens are to be installed at the compound boundaries at these levels which will reduce construction noise by 5-10 decibels. Further information on the positioning of screens is outlined in Table 7 below. For maximum effectiveness, barriers will be brought as close as reasonably possible to either the noise source or the receiving positions. In addition, there should be no gaps or openings at joints in the barrier material. All screens shall be at 'line of sight', height between noise and receptor where reasonably practicable. Subject to safety considerations, temporary screens will be mounted on wheels to facilitate onsite relocation. Any gaps between the ground and the bottom of the panel will be less than 100 mm. Any temporary screens will be fabricated out of impervious boards which have a surface mass of not less than 7 kg/m² minimum.

Shaft	Location of noise suppression screen
Shaft 2	Throughout the worksite periphery at Shaft 2 worksite to minimise both daytime and night-time impacts.
Shaft 3	Towards the north and east of Shaft 3 work site, shielding the properties on Hook's Farm Way and Hook's Lane.
Shaft 4	Towards the South and north of Shaft 4 worksite, shielding the properties along Barncroft Way and St Francis Pl.
Emergency Discharge Chamber	Towards the southwest and north of the Shaft ED_worksite, shielding the properties on Priorsdean Crescent, Corhampton Crescent and Hermitage Close. During the construction of the spillway, it may not be practical to install noise barriers to the southwest of the Shaft ED worksite. Therefore, during the construction of the spillway, noise should be mitigated using acoustic shrouds around noisy plant and equipment.
Shaft 5	Throughout the worksite periphery at Shaft 5 worksite. If the temporary noise barrier around the entire periphery of the worksite is unpracticable, acoustic shrouds should be deployed around noisy plan and construction activity to minimise the impact of the construction noise.
Shaft 6	Throughout the worksite periphery at Shaft 6 worksite. If the temporary noise barrier around the entire periphery of the worksite is unpracticable, acoustic shrouds should be deployed around noisy plan and construction activity to minimise the impact of the construction noise.
Shaft 7	Towards the south and east of the Shaft 7 worksite, shielding the properties on High Lawn Way.
Shaft 8	Towards the west and Southwest of the Shaft 8 worksite, shielding the properties on Bondfields Crescent and Bitterne Close.

Bedhampton Pipeline	Due to the moving nature of work, a temporary noise barrier on wheels can be deployed, which can be moved around and placed to vut of the direct line of site between the noise source and sensitive receptors along the properties on Chadswell Meadows and Kings Croft Lane. Alternatively, for the locations where temporary noise barriers cannot be deployed, acoustic shrouds should be deployed around noisy plan and construction activity to minimise the impact of the construction noise.
Section P2	Due to the moving nature of work, a temporary noise barrier on wheels can be deployed, which can be moved around and placed to vut of the direct line of site between the noise source and sensitive receptors along the properties on Chadswell Meadows and Kings Croft Lane. Alternatively, for the locations where temporary noise barriers cannot be deployed, acoustic shrouds should be deployed around noisy plan and construction activity to minimise the impact of the construction noise.
Reservoir Pipeline	Temporary noise barrier (approximately 30m) on the western end of the reservoir pipeline (where the pipeline bends towards the reservoirs, located approximately 50m east of Swanmore road), to shield properties on Swanmore Road between Inkpen Walk and Mewsey Court.
Middle Park Way Culvert	Towards the west of Middle Park Way Culvert worksite, shielding the properties on Bondfields Crescent and Bitterne Close.
Dunsbury Way Culvert	Throughout the worksite periphery at Dunsbury Way Culvert worksite. Alternatively, for the locations where temporary noise barriers cannot be deployed, acoustic shrouds should be deployed around noisy plan and construction activity to minimise the impact of the construction noise.
Purbrook Way Culvert	Throughout the worksite periphery at Purbrook Way Culvert worksite. If temporary noise barrier around the periphery of the worksite is unpracticable, acoustic shrouds should be deployed around noisy plan and construction activity to minimise the impact of the construction noise.

Table 4 - Location of noise screens

73. Works are to be carried out, in accordance with Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environment Protection Act 1990 (Appendix B). These works are to be detail in site, and task specific, RAMS throughout the project. Typically, works will be carried out during daytime hours for this scheme to prevent any unnecessary disturbance however, tunnelling works for the under-track crossing (UTX) north of shaft 1 may need to be undertaken 24 hours a day. This is to reduce any potential disturbance that may be caused crossing under the tracks. Other nighttime works may be necessary in some situations, as stopping tunnelling work at the end of the day shift may not be possible due to geological conditions and various unfavourable tunnelling parameters. During such scenarios, the tunnelling works would be continued until a favourable situation is encountered to stop the tunnelling works. The impact of these nighttime works would only affect the associated shaft launch location.
74. Construction traffic noise is likely to be most likely at the construction compound and at shaft locations. A Construction Traffic Management Plan (CTMP) (HTR-WAB-PI-ZZ-PL-W-0003) is to be developed to highlight and mitigate the effects of any potential construction traffic noise.

5.6.1 Vibration:

75. The main vibration impacts are likely to arise from surface mounted equipment to facilitate tunnelling operations, and compaction resulting from the movement of heavy plant near shaft locations and open cut sections of the pipeline. The tunnelling works underground are not predicted to impact on any sensitive receptors, however vibration monitoring will be undertaken at receptors closer than 5m from the tunnelling location.
76. The duration of works for shaft construction and the open cut section are not predicted to have a long-term impact on sensitive receptors as works are only proposed to be of short duration. Where practical, 'dead rolling' methods will be employed when carrying out compaction activities near sensitive receptors. This involves using rolling equipment without enabling the vibration setting.

5.7 Dust & Air Quality

77. If there are any issues with dust during the execution of the works, the project team will implement control measures such as damping down to prevent the spread of airborne particulates. If harmful particulates are to be disturbed (e.g. man-made mineral fibres) more stringent controls will be enforced in accordance with the legislation (Appendix B) and/or Client procedures. Compliance against these requirements will be checked as part of the weekly environmental inspection and the results recorded. This inspection checklist (Appendix D) will be reviewed during formal environmental audits.
78. For this scheme, studies have been undertaken to determine the dust arising from the construction of this scheme outlined in the Air Quality chapter of the Environmental Statement (ES) (HTR-ATK-ZZ-ZZ-RP-Z-0107). No demolition works are required for this project. Dust from construction material is predicted to be small, as the pipeline will be below ground and will not require significant infrastructure works. Dust from earthworks is expected to be the largest contributor, as there will be relatively large quantities of materials excavated for shaft construction. HGV movements for the construction of the scheme are expected to be less than 50 outward movements a day. The following table estimates the magnitude of dust produced from each activity.

Activity	Dust emission magnitude
Demolition	n/a
Earthworks	Large
Construction	Small
Material track-out (HGV movement)	Medium

Table 5 - Dust emissions magnitude

Sensitivity of surrounding area		Summary of dust risk			
		Demolition	Earthworks	Construction	Track out
Dust Soiling	High	N/A	High Risk	Low Risk	Medium Risk
Human Health	Medium	N/A	Medium Risk	Low Risk	Low Risk
Ecological	Low	N/A	Low Risk	Negligible	Low Risk

Table 6 - Summary of pipeline expected dust risk.

5.7.1 Air Quality

79. The MPW scheme does not fall within any designated Air Quality Management Area (AQMA) however, works will be carried out in accordance with the Best Practicable Means, as described in Section 79 (9) of the Environmental Protection Act (EPA) 1990 as outlined in the REAC (Appendix A (Pipeline AQ1)) to reduce fumes or emissions which may impact upon air quality. With appropriate mitigation measures in place, any adverse effects resulting from the construction works is to be minimised such that there would not be any significant ongoing or residual effect on receptors. Ward and Burke will implement mitigation measures to address construction dust from the site, considering the direct and indirect impacts of site preparation and construction works on residential and business uses, and ecological receptors such as flora and fauna.

5.8 Dust & Air Mitigation Measures

5.8.1 Site Management:

- Record all Dust and Air Quality complaints, identify cause(s), take appropriate measures to reduce emissions proactively, and record the measures taken.
- Make the complaints log available to the local authority when requested; and
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the logbook.

5.8.2 Monitoring:

- Carry out regular site inspections to monitor compliance with dust management within this CEMP, record inspection results, and make an inspection log available to stakeholders and the client when requested.
- Increase the frequency of site inspections by a site supervisor accountable for air quality and dust issues on site when activities with a high potential to produce dust such as excavation works are being carried out and during prolonged dry or windy conditions; and
- Dust/Noise monitoring stations shall be identified in areas of high construction activity along the pipeline, such as shaft locations and compound areas. The site supervisor is to carry out daily dust and noise monitoring to monitor activities with a high potential to produce dust.

5.8.3 Preparing and Maintaining the Site:

- Site layout shall be planned to ensure machinery and dust causing activities are located away from receptors, as far as reasonably practical.
- Erect solid screens or barriers around dust producing activities or the site boundary that are at least as high as any stockpiles on site, which will aid in preventing the dust being transported by the wind. Stockpiles can also be dampened down using water to prevent dust from rising. Stockpiles will also be seeded if they are to remain in place over a period of 6 months to prevent wind whipping.
- Cutting tools that produce dust must have a Local Exhaust Ventilation (LEV) attached which collects the dust produced preventing the dust from escaping into the atmosphere.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period which will aid in preventing dust particles being transported in the wind.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible (sawdust from wood cutting, concrete, bricks, silica etc.) unless being re-used on site. If they are being re-used on-site cover as described below; and
- Cover, seed, or fence stockpiles to prevent wind whipping.
- Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas to prevent dust rise. Any unsurfaced haul roads and unsurfaced areas that will carry construction traffic will be regularly dampened down to prevent dust rising.

5.8.4 Operating Vehicle/Machinery and Sustainable Travel:

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; and
- Production of a Construction Traffic Management Plan (HTR-WAB-PI-ZZ-PL-W-0003) to manage the sustainable delivery of goods and materials.
- Provide a Construction Workers Travel Plan (HTR-WAB-PI-ZZ-PL-W-0002) which outlines the most sustainable travel options available for WBCL staff.

5.8.5 Operations:

- Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

5.8.6 Waste Management:

- Bonfires and burning of waste materials are forbidden on this project. Refer to Site Waste Management Plan (HTR-WAB-PI-BR-HS-W-0008) for mitigation measures and actions. Processes for controlling any waste produced from construction works are outlined within this document.

5.8.7 Measures Specific to Construction Aggregates:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place and listed within the task – specific RAMS for that particular process. Aggregates to be stored in separate areas to prevent mixing with each other. Concrete blocks will be used to create a bund around aggregates to prevent them mixing and will allow up to 110% of excess storage within the bunded area.

5.8.8 Measures Specific to Track out:

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. Water used for sweeping processes will be processed following guidance from the PMMP.
- No dry sweeping to be undertaken to prevent to production of dust. Ensure muck away lorries entering and leaving sites are covered to prevent loss of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable); and
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permit.

5.9 Water Environment

80. During MPW construction, Ward and Burke shall ensure that no harm to individuals or to the environment occur due to aqueous discharges into controlled waters. Water discharges will be minimised or eliminated where possible.
81. Water carrying silt or other forms of pollution such as oils or lubricants used by the project will be prevented from entering any watercourse or adjoining land, under any circumstances. Measures such as bunding, gully suckers, settlement lagoons, Silt Busters etc. will be utilised to ensure this does not occur.
82. No surface water discharges are to take place without the required Environment Agency discharge permit. Discharges to surface water bodies will only be carried out via the approved discharge route which will be monitored on a regular basis, as defined within the consent/permit register, to ensure they do not cause a breach any of the limits set by the regulator.

83. No foul water discharges are to take place without the required Southern Water discharge consent. Discharges will only be carried out via the approved discharge route which will be monitored on a regular basis, as defined within the consent, to ensure they do not cause a breach any of the limit's set.
84. During excavation works, pumped water will be directed to a suitably sized silt buster, or filtration system as required prior to discharge dependent upon the location and size of the excavations (up to 13m Diameter, 11m depth) and in accordance with the agreed consent/permit.
85. Silt buster or filtration system performance will be monitored to ensure that it is capable of processing the required quantities of water. The discharge rate through the siltbuster or filtration system will be controlled on site and adjusted to ensure adequate performance.
86. Any wet excavated will be temporarily stockpiled within a bunded area to prevent any water escaping into any water courses or into the groundwater. There will be a sump with separation baffle within the bund to allow water to be removed via a pump and discharged as outlined above.
87. Any in-river construction will aim to take place during periods of lower flow rates (e.g. summer), where practicable.
88. Where practical, construction will be carried out below the mean flow rates which will reduce the potential of sediment release.
89. There will be no storage and stockpiling of material in close proximity to the watercourse, where practicable, to minimise the chances of pollution occurring.
90. Compliance against these requirements will be checked as part of the weekly environmental inspections conducted by the EnvCoW or Environment Manager

5.9.1 Source Protection Zones

91. Much of the pipeline corridor lies within a SPZ1c (inner protection zone subsurface activity area). The southern tip of the pipeline corridor lies within a SPZ1 (inner protection zone) which covers the area immediately around the Havant and Bedhampton springs where the Chalk aquifer discharges.
92. The SPZ1 is defined as the area where groundwater in the aquifer has a 50-day or less travel time to the source/abstraction. The SPZ1c extends where the aquifer is confined and unlikely to be affected by surface activities but may be impacted activities at depth, such as deep drilling. As the pipeline corridor is largely confined by London Clay the SPZ1c category applies. The southern extent of the tunnelled pipeline section P1 is situated just within SPZ1 where the Chalk becomes unconfined. This is because no London Clay is present in this location, rather, the Reading Formation, which includes cohesive layers within sand horizons, underlies the superficial deposits at Shaft 1.
93. A Source Protection Zone specific Pollution Management and Mitigation Plan will be developed for construction works for managing chemicals and other contaminants used for construction activities. This will be agreed with Portsmouth Water in advance of the works. This will detail specific measures to be taken in relation to the protection of SPZ's so as not to adversely affect Portsmouth Waters production from the Bedhampton Springs and which will include the following key principles:
 - a. The proposed construction works will remain fully above the chalk aquifer within the cohesive head deposits/Reading formation.
 - b. Monitoring will be carried out at the Bedhampton Springs to check that no contaminants are introduced into these production water as required.
 - c. Where shaft construction works are expected to be founded close to the aquifer construction, they will be allowed to flood and completed under water, where practicable, eliminating the need for de-watering and the potential of flowing water blocking existing flow paths as a result of the loss of material, such as fines

from the excavation. The construction methodology of top-down cast in-situ reinforced concrete caissons provides the flexibility of sinking the caisson in this manner if required.

- d. A closed face slurry type TBM will be utilised for all tunnelling works. This sealed system allows the operator to control face pressures to ensure that tunnelling fluid is not lost to the ground or that ground water is not drained from the ground. Flowmeters will be installed on the feed and return slurry lines to verify that there is no loss slurry to the ground or ground water being drained from the ground.
- e. When working in proximity to sensitive receptors, any tunnelling and shaft construction will be adapted or tailored to ensure no new pathways are created to allow potential pollutants to contaminate aquifers. The annulus between the tunnel and surrounding ground will be grouted upon completion of each tunnel to close off any potential new permanent flow paths. Grouted volumes will be monitored to ensure they match the overall volume of the annulus.
- f. Bentonite is used as a lubricant which has the potential to block existing flow pathways as a result of loss of bentonite from the excavation, blocking such pathways. Volumes of bentonite recirculation will be observed to identify any potential excessive losses of material, i.e., losses of bentonite more than is to be expected from the method applied. Note, bentonite is a non-Newtonian fluid and therefore if exposed to groundwater will become immobile within the aquifer, which is a mitigating measure in bentonites application.
- g. Any other chemicals or substances used in the construction process will be used in a controlled manner and only after consultation between and agreed with Portsmouth Water production and water quality teams. This will include tunnel lubricants and polymer slurry conditioners.
- h. All fuels will be stored in double skinned bowser housed in bunded area. Fuel storage will be kept to minimum volumes required.
- i. Drip trays/plant nappies will be placed under any parked machinery will use oil trays.
- j. Any wet excavated will be temporarily stockpiled within a bunded area to prevent any water escaping into any water courses or into the groundwater. There will be a sump with separation baffle within the bund to allow water to be removed via a pump and discharged in accordance with the relevant permit/consent as outlined above.
- k. All COSHH materials will be installed in a bunded area.

5.9.2 Drainage Management

- 94. A Construction Drainage Management Plan will be established in a separate document. The drainage management plan will also include details of how the construction compounds will safely manage surface water flows in line with the relative Environment Agency Pollution guidance and the Construction Industry Research and Information Association (CIRIA) guidance. Design standards in the drainage management plan will account for any areas of surface or foul water drainage affected by the works which will be identified, and each section of affected drainage should be briefly described, and a proposed solution provided.
- 95. Construction best practice such as silt-curtains, testing of imported material around earthworks/stockpiles to stop any potential contaminated run off will be applied.
- 96. Dewatering flows in excess of 20m³ per day will need to comply with any associated permits and abstraction licenses required from the EA. Groundwater quality sampling may be required prior to discharge.
- 97. Known outfalls of water will be identified and where possible any drainage should tie in with the existing outfalls. Where no existing drainage outfalls are present/known, SuDS principles should be considered to ensure that the discharge rate and volume matches the existing Greenfield rate. The designing of new drainage catchments should include consideration of any potential attenuation sites. High-level drainage catchment assessments should be undertaken to determine the potential attenuation requirements. It is assumed that

drainage scenarios which replicate the current un-attenuated drainage system will remain with no requirement to provide additional water storage.

98. Access Roads and Haulage Routes — the development of drainage from the access roads and haulage routes including the modification/re-alignment, connection into or new access road / haulage road infrastructure will be included. Construction mitigation will include (but not be limited to) measures within the PPGs, e.g. to attenuate and treat polluted runoff.

5.10 Piling Operations

99. All wastes arising will be disposed of in accordance with the controlled waste under the Environmental Act 1990 (Section 33 and 34) (Appendix B) and SHEQ Procedure. Waste carriers must provide a copy of the carrier's license to transport materials and copies of all waste transfer notes or consignment notes where applicable and a copy will be kept by WBCL for future reference and auditing.

5.11 Biodiversity

100. Within the REAC (Appendix A), Ward and Burke are to plan the works to ensure the protection of Sites of Importance for Natures Conservation (SINC's) and ancient woodland. The closest part of the pipeline corridor is approximately 1 km north of Chichester and Langstone Harbours SPA and Ramsar site and 4.2 km north of the Solent and Dorset Coast SPA. The pipeline corridor does not provide suitable habitat for qualifying bird species supported by Chichester and Langstone Harbours SPA and Ramsar site, or Solent and Dorset Coast SPA. Therefore, the construction of the pipeline would not indirectly affect bird species which are part of the SPA/Ramsar site citation. Any potential impacts on the SINC's along the pipeline route will be mitigated by avoiding any encroachment into these areas by establishing appropriate fencing.
101. Areas of open cut installation may have temporary loss of habitat but only for the duration of construction and affected habitats will be reinstated back to the original state following completion. Reinstatement of lost habitats will be carried out using a turfing method, where practicable, which involves removing the topsoil in large turfs and placing them either side of the main trenching/storage and haul road areas. Turfs will then be replaced once the pipe is laid and subsoil has been backfilled. These works will be carried out during the spring/summer months to target drier conditions to avoid impacting the subsoils during construction activities as the site can be very wet during autumn/early winter.
102. An Arboricultural Impact Assessment (HTR-ATK-ZZ-ZZ-RP-L-0001) has been conducted to ensure the protection of trees. Construction of the pipeline route is not predicted to result in direct impacts on ancient woodland. However, there will be work to a culvert near Great Copse so there is potential for indirect impacts from the temporary removal of grassland habitat during culvert works. Any temporary grassland habitat removal will be reinstated following completion of works. Works at shaft 7 are also relatively close to Great Copse however, no pipeline working areas are in the 15 m buffer for ancient woodlands. Where works on a culvert would take place close to the boundary of Great Copse, measures will be put in place to avoid accidental incursion or harm to tree roots by establishing exclusion zones.
103. All mature and other trees will be protected through appropriate mitigation measures or through the realignment of the route to avoid trees. Protection of retained trees will follow standard practice (i.e. BS 5837:2012 Trees in relation to design, demolition, and construction – recommendations) and following the guidance of the Arboricultural Impact Assessment (HTR-ATK-ZZ-ZZ-RP-L-0001). A construction exclusion zone will be established using steel mesh panel fencing, or similar, around retained trees where works are not limited by the existing roads or other associated hard infrastructure that could be protecting underlying tree roots. Works

will be managed and planned to follow a detailed methodology during any turf or soil removal, storage and/or restoration.

5.11.1 Landscape Impact

104. The implementation of micro-tunnelling significantly reduces potential impact to the above ground landscape. The greatest impact on the above ground landscape will result from shaft construction, storage compounds, access roads, and welfare areas. Mitigation measures have been incorporated into the pipeline design to minimise impacts, such as utilising areas of green space for above ground which reduces the need for vegetation removal. The layout of construction compounds, storage areas, and haul roads have been designed to minimise impact on existing vegetation and landscape. Mitigation measures outlined in the REAC table (Appendix A) will also be implemented to aid in protecting the landscape. The appointment of an Environmental Clerk of Works (ENCoW) to monitor compliance of mitigation measures within the REAC will ensure measures are being followed. Post construction, a Landscape Reinstatement plan will be applied to restore landscape earthworks, soils, and any loss of surface vegetation. Where practicable, areas will be reinstated/restored as soon as works in the area have been completed to minimise visible impacts.

5.11.2 Japanese Knotweed Management

105. To avoid the spread of Japanese Knotweed (JK), contact with all parts of the plant must be minimised. The following guidance will be adhered to:

- Any stands of Japanese Knotweed will be fenced off during the works, with a 7m exclusion zone where no ground works will be permitted.
- If any further Japanese Knotweed is found on site during works, works shall stop within 7m of this vegetation and the Environmental Coordinator contacted. A further site walkover will be undertaken, prior to works resuming, to identify any additional stands of INNS or changes to the current extents identified on site.
- A toolbox talk will be given to all site staff on the identification of Japanese Knotweed and the site-specific control measures to be taken. Japanese Knotweed shall be identified in the site induction and information sheets for INNS to be displayed on the site notice boards.
- Signs will also be placed around areas of JK to ensure site staff are aware of where control measures are located. This should ensure all site operatives are aware of the risks posed by Japanese Knotweed and its spread. Areas which contain JK will also be fenced off using Heras fencing to avoid encroachment from operatives.
- Upon completion of the works within a contaminated area, all plant shall be washed down using water and disinfectant to minimise any spread. The Check-Clean-Dry approach will be followed.

106. Any removal of JK will be carried out by a licensed and accredited sub-contractor. Sub-contractors RAMS will be reviewed and approved by WBCL prior to any work commencing to ensure the correct removal of any JK and areas that may be contaminated. RAMS will also be reviewed for appropriate control measures to minimise any potential spreading of JK. To align with DEFRA requirements, contractors for JK removal must be registered and accredited with the following:

- Amenity Forum Membership
- BASIS Professional Register
- BASIS Amenity Training Register
- Basis Nominated Storekeeper (NSK) Professional Register

- Invasive Non-Native Specialist Association (INNSA)
- Property Care Association (PCA)

5.12 Himalayan Balsam (HB)

107. Pre-construction checks will be carried out by the project ECoW for the presence of any additional HB from when area was last surveyed. If works are to be carried out in areas of known HB, a 7m exclusion zone will be established where possibly, specifically from July to September which is typically the seeding stages of HB. HB seeds are contained in a pod, and when it ripens and dries, it comes under tension before splitting and catapulting the seeds up to 7m from the plant. The 7m exclusion zone is to prevent these seeds being transported any further from the site of existing infestation.

5.13 Flora & Habitats

108. All trees, hedges, and shrubs within or adjacent to the site, except those that have been approved for removal shall be protected from damage during construction work by the erection of 'Heras' Fencing. If works around flora result in dust being produced, screens are to be considered to protect Flora against dust. Wherever possible, the removal of any vegetation such as trees and shrubs will be limited, and removal will only be carried out with the prior approval of the SHEQ Advisor and the client. Where the removal of trees, hedges, and scrub is unavoidable, appropriate tree and hedge species will be replanted under the guidance of the project ECoW.
109. Shafts 2 and 3 are both present with similar vegetation and flora, which comprises a modified grassland⁵ playing field, bordered by a line of trees. Species diversity is low, due to the high level of disturbance caused by dog walkers and sport's players. Shaft 4 is primarily comprised of modified grassland and scattered trees and is intersected by hardstanding public footpaths. A small parcel of broadleaved mixed and yew woodland and scattered scrub is present along with a small strip of other neutral grassland to the south of the shaft.
110. The Emergency Discharge Chamber is situated within broadleaved mixed and yew woodland and other neutral grassland⁶. The working area also comprises mixed scrub and a small parcel of other broadleaved woodland to the south with an additional parcel of other broadleaved woodland located amongst the other neutral grassland to the north of the working area. The working area encompasses the Hermitage Stream, and the proposed Emergency Discharge Chamber will include a new spillway connected to the stream. The stream in this location is not reinforced and has exposed earth banks. A small parcel of aquatic marginal vegetation is present to the west of the stream within the working area. The confluence of Hermitage Stream and Riders Lane Stream is located to the southwest of the working area, with Riders Lane Stream following the southern margin of the working area. Further information can be found in the Pipeline Ecological Update (HTR-ATK-XX-XX-RP-Z-0035).
111. Shaft 5 is primarily comprised of other broadleaved woodland to the south of Purbrook Way road, and other neutral grassland to the north. Bramble scrub and broadleaved trees line Riders Lane stream which runs through the shaft working area. Shaft 6 and associated working area is intersected by Dunsbury Way road and associated pavements. The habitats either side of the hardstanding comprise other neutral grassland, modified grassland, and bramble scrub, including scattered trees and scrub. West of the road, broadleaved mixed and yew

⁵ *The NHBS introduction to habitats: Grassland* (no date) *Back to NHBS*. Available at: <https://www.nhbs.com/blog/the-nhbs-introduction-to-habitats-grassland> (Accessed: 02 May 2024).

⁶ *Neutral grasslands*. Available at: http://www.magnificentmeadows.org.uk/assets/pdfs/Neutral_Grasslands.pdf (Accessed: 02 May 2024).

woodland, and dense scrub lines Riders Lane Stream, which runs through the shaft working area. The habitat associated with Riders Lane Stream in Shaft 6 continues into Shaft 7, where the working area predominantly comprises bramble scrub and broadleaved mixed and yew woodland, with a parcel of other neutral grassland. A large proportion of the working area also includes hardstanding in the form of footpaths, pavements, roads, and a WBCL compound area.

- 112. Shaft 8 is the largest shaft and most diverse working area for habitat types and is situated within the Staunton Country Park. The predominant habitat within the working area comprises other neutral grassland with scattered scrub and rushes, and parcels of broadleaved woodland. Riders Lane Stream runs through the working area and is fed by an ephemeral stream which floods to form a pocket of wet woodland to the south of the working area. There are parcels of priority habitats present, comprising purple moor grass and rush pasture and wet woodland within the shaft working area.
- 113. During MPW, excavation is planned for the creation of an access road between Bedhampton PS 1 and Bellway Land in the vicinity of where JK was formerly present. This Japanese Knotweed has been successfully treated above ground but although the species is not currently visible above ground, it may still be active in the form of rhizomes within the topsoil so extra care must be taken when excavating this area to eliminate the likelihood of spreading Japanese Knotweed via the topsoil rhizomes. Further detail of the removal of JK is outlined within the RMA Shaft 1 CEMP (HTR-WAB-PI-W1-HS-W-0001) as this is the only area within the scheme that is affected by the known presence of JK.
- 114. Mitigation measures outlined in the Ecological Management and Monitoring Plan (HTR-ATK-XX-XX-RP-Z-0035) will be implemented to protect flora and habitats throughout construction.

5.14 Fauna

- 115. Wherever possible the project will avoid disturbing any fauna within/near to the project works. Any fauna observed will be monitored and avoidance techniques utilised.
- 116. An Ecological Management and Monitoring Plan (HTR-ATK-XX-XX-RP-Z-0035) has been prepared by AtkinsRealis to inform this CEMP.

5.14.1 Fish Populations:

- 117. A fish management plan will be implemented in any scenarios where fish removal is required under Environment Agency FR2 Consents ⁷ and appropriate screened pumping equipment will be used where necessary. Where culvert upgrades are to be carried out, specific culvert design will avoid detrimental effects on fish passage through appropriate positioning of the new culvert pipes at a level that maintains suitable depths and velocities to facilitate fish passage through the retained existing structures. Any other construction works requiring any temporary dewatering will also be carried out under Environment Agency FR2 Consents for fish removal.

5.14.2 Otters:

- 118. Otter surveys carried out in the area indicated there was no record within 1km of the MPW site within the Pipeline Ecological Update document (HTR-ATK-XX-XX-RP-Z-0035). The closest otter population was determined to be in Langstone Harbour which is approximately 800m south of Shaft 1 working area. Further surveys carried out in the Pipeline Ecological Update (HTR-ATK-XX-XX-RP-Z-0035) identified a single otter spraint located

⁷ Department for Environment, F. & R.A. (2023) *Permission to move live fish to or from a fishery*, GOV.UK. Available at: <https://www.gov.uk/guidance/permission-to-move-live-fish-to-or-from-a-fishery> (Accessed: 02 May 2024).

between Shaft 5 and 6 along Hermitage Stream, however no holts/nesting areas were found. This indicates that the otters may be using the stream as a passage for commuting and foraging. To mitigate any potential risks to otters, surveys will be carried out by the project ECoW before construction commences to check for any further evidence of new otter holts within or close to the working areas. Particular focus will be placed on areas where culvert upgrades are to be carried out, which may be passage areas for otters using the stream for commuting and foraging. If otters are confirmed to be present in these locations and it is not possible to avoid negative impacts to otters, an EPSM license may be required.

5.14.3 Badgers:

119. Badger surveys carried out found three disused badger setts near the working area of Shaft 8, with no currently active setts within the pipeline working area. Areas within the pipeline site have been identified to potentially be used as foraging and commuting areas for badgers. Badger surveys can be carried out at any time of the year. As such, a pre-works checks will be carried out by the project ECoW for badger field signs, including badger setts, is required at least six months prior to works commencing, to determine whether badgers are present or likely absent and a final badger walkover survey will be undertaken prior to works commencing. The pre-works check will also be used to identify and record other mammal holes (i.e. rabbit warrens and fox dens) to prevent an offence under the Wild Mammals Act 1996. There are currently no mitigation measures proposed for badger setts but if it is determined that setts could be harmed by the scheme during the pre-construction surveys, further professional ecological advice will be sought. Mitigation measures will be put in place to prevent any badgers from being trapped within steep sided excavations by blocking any potential access points.

5.14.4 Reptiles:

- 120.** Habitat surveys from 2023 recorded a total of eight reptile species within 1km of the pipeline corridor. These included three records of slow worm, two records of common lizard, one record of adder, and two records of grass snake. These were all identified in the Staunton Country Park area. Great crested newts are considered likely to be absent from the pipeline working area. Habitat suitability for widespread species of reptile was also assessed for the MPW in 2023. The habitat is varied throughout the pipeline route, comprised of grassland, dense scrub, and woodland. There are areas of higher suitability habitats present at Shafts 1, 4, 5, 7, 8 and at the Emergence Discharge Chamber comprising grassland, dense scrub, and woodland.
- 121.** Great crested newts are considered likely to be absent from the pipeline surface working areas, however measures put in place to mitigate for common species of reptile will provide protection for other amphibians present and therefore they are included within this section of the CEMP.
- 122.** Construction areas which are likely to impact reptile habitat will have sufficient habitat adjacent to the working area to support reptiles displaced as a result of construction activity. Where reptile hibernating habitat removal is necessary, it will be carried out with caution during the winter months outside of reptile active under the supervision of the ECoW. If vegetation clearance is necessary during reptile active season (generally to be mid-March – end of October), it must be carried out in a two-stage method. The first stage involves the removal of vegetation up to 150mm from ground level and a hand search of vegetation for reptiles will be carried out by an experienced ecologist. If no reptiles are present, vegetation removal to ground level can proceed. In areas with foraging/basking/commuting potential only, prior to works the area should be cut to 100mm from the base to make it unsuitable for reptiles and then left for at least 48 hrs to allow reptiles to move out of the area (unless outside of the active season for reptiles/amphibians). The ECoW will hand-search areas immediately prior to topsoil stripping. All retained vegetation will be protected for use as receptor sites.

5.14.5 Bats:

123. Bat surveys were carried out in 2023 and 2024 to determine the presence of bats within the scheme. All trees within a 10m buffer of the site were assessed for their suitability to support roosting bats. Ground level surveys were carried out in the site boundary which involved the identification of potential roosting features (PRFs) such as woodpecker holes, rot holes, cracked limbs, dense ivy and flaking bark. Results from the ground level survey and aerial inspections in the Pipeline Ecological Update (HTR-ATK-XX-XX-RP-Z-0035) 2023 identified 25 trees with potential roosting features (PRFs) for bats. There were eight trees which were assessed as providing moderate potential to support roosting bats and four with high potential. The remaining 13 trees were assessed as providing low potential to support roosting bats. There were 12 trees identified within the site boundary with roosting potential, with 9 low potential trees present, and 3 with moderate potential and none of them were deemed to have been of high potential. Additional ground level tree assessments were undertaken in 2023 which identified 2 trees with moderate potential to support roosting bats, and 2 trees with high potential to support roosting bats. Preliminary bat roost assessments (PBRAs) were also conducted in 2023 for 2 buildings within the Bedhampton compound referred to as Bedhampton 1 (B1) and Bedhampton 2 (B2). B1 was assessed as providing high potential to support roosting bats, whilst B2 was assessed as having moderate potential. Further surveys in 2024 confirmed that B1 and B2 provided high and moderate potential for roosting bats. Further information can be found in the Pipeline Ecological Update (HTR-ATK-XX-XX-RP-Z-0035)
124. The pipeline works are not expected to result in the loss of any known bat roosts or permanent loss of foraging or commuting habitats. It is expected that 9 trees of having low bat roosting potential will be lost as a result of the works. Before any of these trees are removed, a preclearance check will be carried out by the project ECoW to ensure the status of the tree has not changed. Removal of these trees will also be supervised by a licensed bat ecologist under specific working RAMS which will inspect the trees at felling intervals to ensure no undiscovered bat roosts are present. Trees with moderate potential were identified at Shaft 1, 2, and 4 and these will remain in situ and will be clearly identified. Toolbox talks will also be carried out to reiterate the importance of protecting these trees during any planned works in their vicinity.
125. No construction activity is to occur outside the hours of 07:30-18:00 on weekdays and 07:30-13:00 within the working areas of Shaft 1, 2, and 4 to prevent disturbance to bats emerging from/re-entering potential roosts or to commuting bats. Any temporary lighting required during construction will be designed to minimise light spill, and to avoid light spill of more than 0.5 Lux on retained habitat and on trees and buildings assessed as providing suitability for roosting bats. A buffer is to be implemented and maintained around trees and buildings during construction.

5.14.6 Breeding and non-breeding birds:

126. Annex 1 bird species have recently been associated with Hermitage Stream. There has been three records of ferruginous duck and three records of Kingfisher associated with Hermitage Stream. The Kingfisher was recorded within the Shaft 1 working area. The presence of Cetti Warbler was identified between the Emergency Discharge Chamber and Shaft 5 proposed construction locations. There are two records of Mediterranean gull and one record of red kite within the Shaft 4 working area and one little egret record within Shaft 8 working area. Red listed species, Firecrest, were noted in the Pipeline Ecological Update (HTR-ATK-XX-XX-RP-Z-0035) within the Staunton Park area. Pre-construction checks for the presence of Annex 1 bird species will be carried out by a

suitably experienced ecologist. If nesting sites are identified during pre-construction checks, nests will be left in situ whilst the nests are occupied with exclusion zones established following the guidance of the ECoW.

5.14.7 Nesting Birds:

127. All vegetation removal required for the MPW will be carried out outside of the core nesting season which generally runs from March to September. If this cannot be achieved in certain areas, the vegetation to be removed will require an ecological inspection prior to removal by the project ECoW to ensure that no occupied nests are disturbed. If nests are identified in the survey, this vegetation must remain unharmed in situ by establishing an exclusion zone identified by the ECoW whilst the nest is occupied. The ECoW will assess the site to determine when vegetation works can proceed in this area.

5.14.8 Dormouse:

128. It has been assessed that there are suitable habitats present within Shaft 7 and Shaft 8 working areas for dormouse. The clearance of the woodland and scrub habitats at Shafts 7 and 8 will be covered under a hazel dormouse EPSM licence, in line with any mitigation measures outlined within the license. Dormouse surveys will be carried out by qualified ecologists within the Great Copse woodland which lies between Shaft 7 and Shaft 8 as this has been identified as a potential area of dormouse presence. No specific mitigation for dormice is proposed for the remaining pipeline works areas. The EPSM method statement will outline the timing and methods to be followed and all vegetation removal in these locations will be supervised by the named ecologist on the EPSM licence. Before any dormouse vegetation clearance takes place, toolbox talks will be carried out to ensure operatives are aware of their responsibilities to carry out works within approved guidelines.

5.15 Energy Consumption and Minimisation

129. Energy consumption and management on the project will be monitored and the information (invoice copies) submitted to the SHEQ Department on a quarterly basis. This is to be monitored under Ward and Burke's ISO 50001:2018 Energy Management System. Wherever possible renewable sources of energy will be utilised on the project, either directly or indirectly. Measures will be implemented on site to reduce the energy used e.g. poster campaign to remind personnel to switch off equipment when not in use, switch off stickers to be placed above light switches (motion sensors on lights to be investigated), energy conservation toolbox talk to be carried out etc. Plant and equipment should be sourced which is adequate for the required task (for example an appropriately sized generator). A Graded appliances are to be considered for Site Welfare.

5.16 Fluorinated Gases

130. Any refrigerant gases used in equipment, such as air conditioning units must be known. A register of equipment, containing such gases must be kept detailing the type of gas and the quantity. The amount of gas within each piece of equipment will determine if six monthly or annual maintenance is required. Maintenance must be carried out by trained, competent personnel. Copies of qualifications for those undertaking the maintenance of the equipment must be held on file at the relevant location/site. Personnel wishing to undertake leak checking, recovery, installation, servicing, and maintenance on RAC systems containing or designed to contain 3 kg or more of an F gas refrigerant need to hold formal qualifications which cover as appropriate: installation, testing

and maintenance of air-conditioning and heat pump systems; Installation and maintenance of refrigeration systems; leak checking, recovery, servicing, and maintenance of equipment.

131. Personnel wishing to undertake leak checking, recovery, installation, servicing, and maintenance on RAC systems containing or designed to contain less than 3 kg of F gas need to hold formal qualifications covering: Installation, servicing, and maintenance of equipment with a charge of less than 3kg, (6kg if hermetically sealed) and leakage checking.

5.17 Traffic Management

132. Noise and nuisance caused by traffic associated to the project should be minimised as far as possible. A Construction Traffic Management Plan for this phase of the works has been developed (HTR-WAB-PI-W1-PL-W-0001). The following will be followed to reduce the likelihood of nuisance arising:

- Traffic to and from site shall use the approved route for site traffic shown on the approved plan.
- 'No Access' signage for their construction traffic at designated areas will be installed.
- A detailed schedule, detailing the volume, timing and density of construction traffic will be provided.
- Vehicle movement on site to be restricted to 10mph.
- Road cones may have to be placed at designated areas and warning signs posted in advance of lights.
- Heavy goods vehicles shall not arrive or leave the site except between agreed hours. Any heavy goods vehicles movements' out-with the agreed hours shall be notified to the Project Manager for prior approval.
- During construction the approved traffic route is to be kept free of mud and debris resulting from the development. Any such deposits found on the local roads is to be removed regularly using road brushes and vacuum road sweepers.

5.18 Flood Risk Activity Permit

133. A Flood Risk Activity Permit (FRAP) is a permit from the Environment Agency that allows construction activities to be undertaken near main rivers and provides a site-specific assessment of flood risks in relation to the developments being carried out. Suitable mitigation measures are outlined in this plan which shall be incorporated within the scheme which ensures the safety of personal and the environment in the surrounding area during construction and operational phases. A series of FRAP's will be required across the pipeline route. The table 6 below provides further information about the FRAP requirements for the main pipeline works.

Activity	Location	Party Involved	Type of Permit	Temporary/Permanent Works
Shafts	Shaft 5	Environment Agency	Bespoke Permit	Both
	Shaft7	Environment Agency	Bespoke Permit	
	Shaft 8	Environment Agency	Bespoke Permit	

	Shaft 6	Environment Agency	Bespoke Permit	
Washout Discharge	Shaft 4	Environment Agency	Bespoke Permit	Both (permanent discharge points for pipeline washout/scour)
	Shaft 7	Environment Agency	Bespoke Permit	
Culvert Works	Purbrook Way	Environment Agency	Bespoke Permit	Both
	Dunsbury Way	Environment Agency	Bespoke Permit	
	Middle Park Way	Environment Agency	Bespoke Permit	
Emergency Discharge Chamber	Hermitage Stream/RLS confluence	Environment Agency	Bespoke Permit	Both
Trenchless Crossing	Hermitage Stream at Barncroft Way (P3)	Environment Agency	Bespoke Permit	Both
	Hermitage Stream/RLS confluence (P4)	Environment Agency	Bespoke Permit	
	Riders Lane Stream at Ditcham Crescent (P5)	Environment Agency	Bespoke Permit	
	Riders Lane Stream at Riders lane (P6)	Environment Agency	Bespoke Permit	
	Riders Lane Stream at High Lawn Way (P7)	Environment Agency	Bespoke Permit	
	Riders Lane Stream at Middle Park Way (P8)	Environment Agency	Bespoke Permit	
Temporary Bridge Crossing	Riders Lane Stream Shaft 5	Environment Agency	Bespoke Permit	Temporary

Table 7 - FRAP Permits

134. As the works above do not fit within any of the standard rules for an exemption or exclusion, a bespoke permit will be required for each activity which provides in depth details about the risks and activities for each activity. When applying for bespoke permits, WBCL will ensure that a complete RAMS is carried out for each activity, and plans and documents describing the works to be carried out for each activity are prepared.
135. From the ground site investigation carried out there are no expected artesian conditions that will be encountered that could cause surface flooding in proximity to the works.

5.19 On-site Emergency Flood Plan

136. An on-site Emergency Flood Plan (HTR-WAB-PI-ZZ-PL-W-0004) will be prepared in a separate document. On site plans are designed to manage any risks that may result in an uncontrolled release of water. Plans will include information on key personnel involved on site for responding to emergency flooding situations and the mitigating actions to be taken to control the unprecedented release of large volumes of water. The main objectives of the Emergency flood plan are as follows:
- Raise awareness of the risk of flooding in the specified location.
 - Detail the flood warnings and estimate what lead time is available.
 - Detail how the Plan is triggered, by who and when and define any areas of responsibility for those participating in the Plan.
 - Describe what actions are required by the people in the development and to establish safe access and egress routes to a safe location.
 - Outline the evacuation procedure and place of refuge for all personnel on site, taking into consideration individuals that may have restricted movement.
 - Establish procedures for implementing, monitoring, and maintaining the Plan.
137. Further information relating to flood risk and procedures will be outlined within the Emergency Flood Plan document.

5.20 Effects on Climate

138. Reduction in greenhouse emissions is a core part of the design for this scheme. Focus will be placed on:
- Improving energy efficiency in base design, consider decentralised low carbon energy sources to achieve an overall improvement in operational energy efficiency.
 - Improving climate resilience of the reservoir, ensuring management of reservoir flows, considering whole life sustainability impacts.
 - Minimising material quantities as much as possible and select alternative low carbon materials in design wherever possible.
139. These factors aim to contribute to the UK's Net Zero Carbon target by minimising the production of greenhouse gases wherever is possible. Factors in the schemes design to achieve these targets include the re-use of site won aggregates for backfilling where possible and minimising the number of bends in the pipeline design to reduce the overall length of the pipeline structure. The predicted embodied carbon emissions from material used in pipeline construction is approximately 6,356 (tCO₂e). The predicted emissions produced from plant and equipment to be used is approx. 5,379 tCO₂e. and transportation of materials to site will generate approx. 307 tCO₂e.

5.21 Ground Condition Impact

- 140.** Construction of the pipeline is expected to have some effects on ground conditions within the scheme as outlined in the Ground Conditions chapter of the ES (HTR-ATK-ZZ-ZZ-RP-Z-0110). Measures will be taken during the design phase to reduce potential negative impacts on ground condition such as soil erosion, soil compaction and ground stability. Excavated materials will be processed at shaft locations to prevent unnecessary transportation and prevent excess compaction. Earthworks shall be planned to minimise soil exposure from the stripping of vegetation, as far as practicable and areas required for temporary works would be reinstated as soon as possible when they are no longer required. Stockpiles shall be managed to reduce soil erosion and dust exposure by applying preventative techniques which may include water spraying and seeding. The impacts on soil erosion and soil compaction are therefore considered to be temporary, medium term, and direct.
- 141.** Construction works such as tunnelling and trenching may have an affect on ground stability. As the duration of works for each section of the pipeline are over a short period, the magnitude of soil stability impact is expected to be relatively low.
- 142.** As most ground condition impacts are expected in the construction phase, it is not expected that the operational phase will have any significant disturbances on ground erosion, compaction, and stability.
- 143.** Further information is available in the Ground Conditions report (HTR-ATK-ZZ-ZZ-RP-Z-0110).

Appendix A: REAC Table

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre- Construction C - Construction O - Operation A - All	Completion record
Air Quality							
Pipeline AQ1	CH7	To limit and control emissions to air during construction to avoid direct and indirect impacts on Community and ecological receptors.	Works will be carried out in accordance with the Best Practicable Means, as described in Section 79 (9) of the Environmental Protection Act (EPA) 1990, to reduce fumes or emissions which may impact upon air quality. Selected mitigation measures given in the IAQM Construction Dust Guidance which are applicable to high risk construction sites are described below. With appropriate mitigation measures in place, any adverse effects resulting from the construction works would	Community and ecological receptors sensitive to dust (IAQM guidance)	Undertake regular site inspections (recommended daily), maintaining a log of dust soiling checks and any corrective actions taken. This may be supplemented with information pertaining to site	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			be minimised such that there would not be any significant residual effect on receptors. The Principal Contractor will implement appropriate mitigation measures to address construction dust from the site, where practicable, taking into account the direct and indirect impacts of site preparation and construction works on residential and business uses, and ecological receptors. Mitigation measures include: Site Management: - Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. - Make the complaints log available to the local authority when asked; and - Record any exceptional incidents that cause dust and/or air emissions, either on- or off-		activities & weather conditions		

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre- Construction C - Construction O - Operation A - All	Completion record
			site, and the action taken to resolve the situation in the logbook. Monitoring: - Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. - Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and - Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where practicable commence baseline monitoring at least three months before work commences on site or, if				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			it a large site, before work on a phase commences. Preparing and Maintaining the Site: • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable; • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site; • Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period; • Avoid site runoff of water or mud; • Keep site fencing, barriers and scaffolding clean using wet methods; • Remove materials that have a potential to produce dust from site as soon as practicable,				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			unless being re-used on site. If they are being re-used on-site cover as described below; and - Cover, seed or fence stockpiles to prevent wind whipping. Operating Vehicle/Machinery and Sustainable Travel: - Ensure all vehicles switch off engines when stationary - no idling vehicles; - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; and - Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. Operations: - Only use cutting, grinding or sawing equipment fitted or in conjunction with				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems; • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where practicable and appropriate; • Use enclosed chutes and conveyors and covered skips; • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			Waste Management: - Avoid bonfires and burning of waste materials. Measures Specific to Construction: - Ensure sand and other aggregates are stored in bunded areas, where practicable, and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Measures Specific to Trackout: - Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. - Avoid dry sweeping of large areas;				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			• Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; • Record all inspections of haul routes and any subsequent action in a site log book; • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned; • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);and • Ensure there is an adequate area of hard surfaced road between the wheel wash				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			facility and the site exit, wherever site size and layout permits.				

Historic Environment

Pipeline HE1	Ch 8	To identify, evaluate, and record impacts to archaeological remains	Development of an Archaeological Management Plan	The Archaeological Management Plan will include: The potential for prehistoric archaeological remains within the boundaries of the pipeline; The identification and interpretation of remains associated with the	Production and archiving of report on the findings of works done under the Archaeological Management, including approval from the LPA Archaeologist.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre- Construction C - Construction O - Operation A - All	Completion record
				value of the Leigh Park RPG and the Sir George Staunton Conservation Area where they may add to the value of these assets. Measures to address the potential for impacts to as-yet unknown archaeological remains.			

Biodiversity

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline B1	CH9	To set out mitigation and compensation for the Pipeline	Develop a detailed Ecological Management and Monitoring Plan (EMMP), to include strategy, responsibility and timing of actions to deliver onsite mitigation and compensation measures for the pipeline.	Stakeholder comments will be obtained from LPA, Natural England, and Environment Agency.	Agreement of EMMP by LPA. Quarterly ECoW progress reports to be provided to LPA during construction.	P, C	Initial: Date:
Pipeline B2	CH9	To assist appointed construction contractor in meeting biodiversity requirements	Ecological Clerk of Works (ECoW) to be appointed, to be full time on site during site preparation and clearance and during any works in sensitive areas, and to undertake regular monitoring visits throughout construction programme.	ECoW to be appointed by contractor will be suitably qualified and experienced ecologist.	Quarterly ECoW progress reports to be provided to the LPA	C	Initial: Date:
Pipeline B3	CH9	To protect areas of SINCs and ancient woodland outside the working areas	Install protective fencing (a fence type with high visibility will be used) at the edge of the working area, including protecting a 15m buffer zone around all ancient woodlands where practicable, and with expert		Integrity of adjacent areas to be monitored on weekly basis by ECoW. Updates to be included in quarterly	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		from accidental incursion	arboricultural advice where work is required within 15m, and maintain throughout construction.		ECoW progress report to LPA.		
Pipeline B4	CH9	To protect retained trees, including veteran trees, from harm	The Tree Protection Plans (refs HTR-ATK-PZ-BR-DR-L-0001-0011) show all the recorded trees within the Scheme extents. These include those that require removal to facilitate the Scheme. All trees identified for retention , including veterans, will be protected in line with mitigation measures detailed within Arboricultural Impact Assessment. Protection of retained trees is to follow standard practice (i.e. BS 5837:2012 Trees in relation to design, demolition and construction – recommendations). A construction exclusion zone will be established using steel mesh panel fencing, or similar, around retained trees where works are not limited by the existing roads or other associated hard infrastructure that could be protecting underlying tree roots. The TPPs show where incursions are required into root protection areas and the mitigation measures required to facilitate these works, notably the requirements for	Stakeholder comments will be obtained from LPA and Natural England.	Agreement of tree protection strategy by LPA. Quarterly ECoW progress reports to be provided to LPA during construction.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			any root pruning and arboricultural supervision during excavations. The retained veteran trees shall be assessed by an arboriculturist prior to construction to inform on any potential remedial works that maybe required to manage any structural or physiological defect(s) that increase the likelihood of full or partial failure of the tree or tree part within falling distance of the works. This forms part of a duty of care to both people and property laid down in the Occupiers Liability Acts 1957 and 1984, the Highways Act 1980 and Health and Safety at Work Act 1974. Veteran habitat features are often defects, meaning any potential works will be sympathetic, whilst being reasonable in order to manage the risk of harm to people or property				
Pipeline B5	CH9	To ensure habitat is protected and restored within	Create and follow a detailed methodology for turf and soil removal, storage and restoration for pipeline installation within the SINCS.	Measures to be set out in EMMP.	Agreement of EMMP by LPA. Updates to be included in quarterly ECoW	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		High Lawn and Thicket Lawn SINC			progress report to LPA.		
Pipeline B6	CH9	To protect Great Copse ancient woodland and SINC	During detailed design, set out working area and methods to minimise incursion into the Great Copse SINC and avoid any incursion within the ancient woodland area of the SINC and include measures to protect all mature trees throughout construction and to restore vegetation after works.	Detailed design will protect all mature trees	Agreement of EMMP by LPA. Quarterly ECoW progress reports to be provided to LPA during construction.	P, C	Initial: Date:
Pipeline B7	CH9, CH15	To protect watercourses from construction related pollution risk	The PC will adopt best practice to avoid pollution of watercourses. This is to include but is not limited to adherence to Guidelines for Pollution Prevention (GPP), latest Environment Agency pollution guidance available from data.gov, and Construction Industry Research and Information Associated (CIRIA) guidance on the control of water pollution from construction sites.	Contractual responsibilities between Portsmouth Water and PC. Pollution prevention measures are	No reportable incidents of construction related watercourse pollution above thresholds	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
				detailed in the CEMP. The PC will have access to relevant guidance material.			
Pipeline B8	CH9	Protection of existing fish populations	During watercourse dewatering activities (specifically to facilitate the open cut pipeline crossing of the Lake Stream), the three culvert upgrades on Riders Lane Stream and if required for the construction of the Emergency Discharge spillway on the Hermitage Stream) appropriately screened pumping equipment will be deployed to reduce risk of fish entrainment. Particular care should be taken to remove European eel (a critically endangered species) from soft sediments and culverts.	Construction of the open cut pipeline crossing of the Lake Stream, three culvert upgrades on the Riders Lane Stream and construction of the Emergency Discharge Chamber may require dewatering and over pumping of existing watercourse	No harm to fish during dewatering activities.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
				lengths. Approaches to prevent harm to fish will be required as part of the Flood Risk Activity Permits / best practice.			
Pipeline B9	CH9	Protection of existing fish populations	Development of a fish management plan to cover appropriate methods for the removal of fish from any sections of channel requiring dewatering. To include the use of appropriately screened pumping equipment to reduce the risk of fish entrainment/impingement.	Construction of the open cut pipeline crossing of the Lake Stream, three culvert upgrades on the Riders Lane Stream and construction of the Emergency Discharge Chamber may require dewatering and	No harm to fish during any removal process. Detail of fish removal/translocation reported within Environment Agency FR2 consenting process.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre- Construction C - Construction O - Operation A - All	Completion record
				over pumping of existing watercourse lengths. Approaches to prevent harm to fish will be required as part of the Flood Risk Activity Permits / best practice. Any fish removal will need to be undertaken with regard to Environment Agency FR2 consenting requirements.			

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline B10	CH9, CH15	Protection of retained watercourses and associated flora and fauna	Development of pollution management plans for the construction of the open cut pipeline crossing of the Lake Stream, three culvert upgrades on the Riders Lane Stream and construction of the Emergency Discharge Chamber which shall include fine sediment control measures e.g. in channel silt fences to avoid detrimental effects on aquatic habitats and species associated with fine sediment release from the construction area. Discharges to surface water drainage or watercourses associated with shaft construction, and non-emergency washout valve testing will require environmental permitting. A management plan will be implemented to ensure appropriate treatment prior to discharge to any existing surface water drainage or watercourses.	There will be a requirement to manage potential of pollution and silt propagation within watercourse channels associated with in channel working. Required as part of Flood Risk Activity Permits.	No reportable incidents of construction related watercourse pollution above thresholds. Quarterly ECoW progress reports to be provided to LPA during construction.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline B11	CH9, CH15	Watercourse mitigation and compensation	Reinstatement of riparian zones (e.g. bank profiles and/or vegetation cover) following disturbance from construction associated with construction compounds, culvert upgrades and the open cut pipeline crossing under the Lake Stream. Ecologically sensitive reinstatement of channel (e.g. bank profiles, channel bed profile and sediments and riparian vegetation cover) following temporary channel loss associated with construction of the pipeline crossing of the Lake Stream following advice from an ecologist.	Stakeholder comments will be obtained from LPA and Environment Agency.	Agreement of Watercourse Mitigation and Compensation Strategy by statutory authorities. Mitigations and compensation meet objectives within the timescales set out within the Watercourse Mitigation and Compensation Strategy.	A	Initial: Date:
Pipeline B12	CH9, CH15	Protection of existing fish populations and	A culvert design configuration will be developed that avoids detrimental effects on fish passage through appropriate positioning of the new culvert pipes at a level that maintains suitable depths and velocities to	Requirement to maintain ecological	Implemented as designed.	P, C	Initial: Date:

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		watercourse connectivity	facilitate fish passage through the retained existing structures.	connectivity within the system.			
Pipeline B13	CH9	Protection of bats from indirect harm	Mitigation will be provided for lighting during construction. Any temporary lighting required during construction will be designed to minimise light spill, and to avoid light spill of more than 0.5 Lux on retained woodland areas. Pre-felling check of low potential bat trees required to confirm status of tree has not changed. Licensed bat ecologist to be present during felling. Further emergence surveys of Bedhampton 1 and 2 will be carried out to determine if roosting bats are present. Necessary mitigation to avoid impacting any known roosts or compensate for any necessary loss of a known roost/s will be implemented.	Further mitigation to be agreed with Natural England if roosting bats are found and there is potential for roosting bats to be impacted by the works on Bedhampton 1 and 2.	If temporary lighting is required, updates will be included in ECoW's quarterly progress reports to be provided to LPA during construction. Bat report to be provided to LPA and Natural England (if bat roosts are found) European Protected Species Mitigation (EPSM) licence to be obtained from Natural England if	P, C, O	

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					roosts are found and cannot be avoided.		
Pipeline B14	CH9	Protection of otters	Precautionary pre-clearance survey will be undertaken at watercourses and areas of scrub and woodland linked to watercourses. Vegetation clearance in these areas will follow Precautionary Method of Working. Light spill on watercourses will be avoided.	Further mitigation to be agreed with LPA if evidence of otters is found.	Quarterly ECoW progress reports to be provided to LPA during construction.	P, C	
Pipeline B15	CH9	Protection of badgers	Precautionary pre-clearance survey will be undertaken at areas of suitable habitat. Vegetation clearance in these areas will follow Precautionary Method of Working.	A licence will be obtained if badgers colonise the site and a sett requires closure.	Quarterly ECoW progress reports to be provided to LPA during construction.	P, C	
Pipeline B16	CH9	Protection of nesting birds	Precautionary pre-clearance survey will be undertaken at areas of suitable habitat if clearance is required in the nesting season (typically March to August). Vegetation clearance in these areas will follow Precautionary Method of Working.	Further mitigation to be agreed with LPA if evidence of nesting kingfisher or Cetti's Warbler is found.	Quarterly ECoW progress reports to be provided to LPA during construction.	P, C	

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			Pre-construction check for kingfisher nests and breeding Cetti's warbler to be undertaken where works are planned in suitable habitat during the kingfisher breeding season (March to July) and Cetti's warbler breeding season (April to August). Mitigation to reduce disturbance such as fencing and/or timing of works in suitable areas outside of core breeding season may be required.				
Pipeline B17	CH9	Protection of reptiles	Retained vegetation will be protected for use as receptor sites. Clearance of suitable habitat will follow the method of habitat manipulation and displacement as outlined in the EMMP.		Quarterly ECoW progress reports to be provided to LPA during construction.		
Pipeline B18	CH9	Avoid spread of invasive non-native species	CEMP includes detailed methods to minimise risks of spreading invasive non-native species by managing risks and removing them, including the adoption of Check Clean Dry procedures to be followed before and		Agreement of CEMP by LPA.	P, C	

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			after any in channel works and pre-construction checks to avoid spread of invasive aquatic invertebrate and plant species (including Himalayan balsam).				
Pipeline B19	CH9	Monitor works to inform adaptive management	EMMP will set out monitoring requirements. These will include habitat monitoring to inform management decisions for the restored grassland in the High Lawn and Thicket Lawn SINC during the maintenance period.		Agreement of EMMP by LPA.	P, C, O	
Pipeline B20	CH9	Protection of hazel dormice.	Works at Shaft 7, Shaft 8 and Section 9 to be undertaken under the scheme specific EPSM licence for hazel dormice. Compensatory nest boxes for hazel dormice to be erected in retained habitat within 100 m of Shaft 7, Shaft 8 and Section 9 as per the mitigation requirements of the draft EPSM hazel dormouse licence for the Pipeline Scheme (locations to be confirmed in early 2024).	Mitigation to be followed as per EPSM licence/as agreed with Natural England.	Quarterly ECoW progress reports to be provided to LPA during construction.	P, C, O	

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline B21	CH9	To report as required under licences	Monitoring requirements will be met, as set out in the hazel dormouse licence.	N/A	Reports to be provided to Natural England and copied to LPA.	C, O	
Pipeline B22	CH9	To ensure small-flowered buttercup and wall bedstraw are reinstated	Create and follow a detailed methodology for topsoil removal and reinstatement of soil following works completion and carry out monitoring as set out in the EMMP.	Measures to be set out in EMMP.	Agreement of EMMP by LPA. Updates to be included in quarterly ECoW progress report to LPA.	P, C, O	
Pipeline B23	CH9	Avoid spread of invasive non-native species (operational)	An INNS Risk Assessment needs to be completed to understand if proposed pipeline connections carry a risk of spreading invasive non-native species within the Hermitage Stream catchment; or to other hydrological catchments. An options appraisal should be undertaken to review what (if any) mitigation measures are available that	INNS Biosecurity Plan will provide context and areas of focus for mitigation.	INNS Risk Assessment Report INNS Mitigation Measures options appraisal		

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			can limit or prevent the risk of INNS spreading as a result of scheme operation. These mitigation measures may well change certain aspects of the scheme design.	Mitigation needs to be agreed with the EA			

Ground conditions

Pipeline GC1	CH 10	To prevent injury/death to on-site human health receptors and/or damage to property receptors associated with potential discovery of UXO.	Principal Contractor to undertake further assessment of potential UXO risks to determine the requirement for the implementation of UXO mitigation measures during the open-cut and tunnelling works. Mitigation measures to be implemented as appropriate in the Health and Safety File, Construction Phase Plan, RAMS, Emergency Response Plan and HEMP.	Zetica UXO risk maps have identified the potential risk of encountering UXO within the southern section (from Purbrook Way in the north to the Bedhampton Water Works in the south)	Mitigation measures to be included within the Health and Safety File, Construction Phase Plan, RAMS, Emergency Response Plan and HEMP as appropriate. All required mitigation measures to be implemented during the construction	A	Initial: Date:
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Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
				of the site as 'moderate'.	phase as appropriate. Residual risks to be managed as appropriate through the operational phase.		
Pipeline GC2	CH 10	To prevent adverse risks to on-site and off-site human health, controlled waters, property and ecological receptors from the potential disturbance/mobilisation of existing	Further assessment of the ground conditions underlying the Scheme to be undertaken through ground investigation, if required such as in areas where contamination is identified during works. Remediation of soil/groundwater contamination as appropriate, if further investigation and risk assessments deem it necessary. This CEMP includes the following mitigation measures, as appropriate: Health and safety RAMS and appropriate PPE to be implemented for the protection of	Potential on-site and off-site sources of contamination and potential contamination linkages (PCLs) have been identified for the site which require further investigation and assessment to characterise potential risks.	Further assessment of the ground conditions to be completed as appropriate. Remediation of soil/groundwater contamination as appropriate to be undertaken if required. Preparation of reports as required (e.g. GQRA, remediation	P, C	Initial: Date:

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		contaminated soil or groundwater and/or introduction of new sources of contamination (i.e. from spillages and leaks) during construction works.	construction workers in accordance with the COSHH Regulations 2002 (as amended); - Minimising the area and duration of soil exposure and timely reinstatement of vegetation or hardstanding to prevent soil erosion; - Stockpile management (such as water spraying and covering) to reduce windblown dust and surface water run-off as appropriate; - Clear segregation between stockpiled material including imported material, excavated material stockpiled for re-use and excavated waste material stockpiled for treatment and / or off-site disposal; - Implementation of appropriate dust suppression measures to prevent migration of contaminated dust as required; - Implementation of working methods during earthworks to manage groundwater and surface	Potential short-term exposure (acute risk) to construction workers should be assessed by the Principal Contractor and managed through the application of suitable health and safety assessments and working methods. There is the potential for unforeseen contamination to be encountered during earthworks.	strategy and/or Verification Plan) for submission to and approval by the Local Authority prior to the commencement of construction. Mitigation measures to be included within the CEMP, Health and Safety File, Construction Phase Plan, RAMS and Emergency Response Plan as appropriate. All required mitigation measures to be implemented		

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			water appropriately and ensure that there is no uncontrolled run-off from the works, any material / waste stockpiles, and storage containers into adjacent surface watercourses; • Implementation of appropriate and safe storage of fuel, oils and equipment during construction in accordance with the COSHH Regulations; • Implementation of appropriate pollution incident control e.g. plant drip trays and spill kits; • Implementation of an appropriate Materials Management Plan (MMP) to document how excavated materials will be managed; and • Implementation of a contamination watching brief by suitably qualified and experienced personnel to be completed for the Scheme when excavating areas of potential contamination risk. If unidentified contamination is encountered, works to be suspended in the area and appropriate	In addition, there is the potential for introducing new sources of contamination (i.e. from spillages and leaks) during construction works.	during the construction phase.		

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			investigations and remediation to be discussed and agreed with stakeholders and completed in accordance with current best practice. Mitigation measures to be implemented as appropriate in this CEMP, Health and Safety File, Construction Phase Plan, RAMS and Emergency Response Plan.				
Pipeline GC3	CH 10	To prevent adverse risks to on-site and off-site human health, controlled waters and ecological receptors during the operational phase	Principal Designer to incorporate appropriate mitigation/remedial measures in the design of the Scheme to reduce impacts from contamination as required. The Scheme will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention. Mitigation measures to be implemented as appropriate in the HEMP.	The operation of the Scheme could potentially introduce new sources of contamination. Spillages and leaks may occur from machinery, and below ground services and leakage from the	The 'as constructed' Scheme is in accordance with the submitted design and planning applications. Mitigation measures to be included within HEMP as appropriate. Risks to be managed as appropriate	O	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		associated with the potential introduction of new sources of contamination.		reservoir could create additional potential pathways for the migration of potential contamination.	through the operational phase.		
Pipeline GC4	CH 10	To maximise the use of site-won materials in the construction of the Scheme and reduce amount of soils disposed off-site.	Further assessment of the ground conditions underlying the Scheme to be undertaken through ground investigation to provide information for soil re-use, as required. Principal Designer to seek as far as reasonably practicable, to reduce the amount of soil/materials excavated and/or of a hazardous nature, to re-use and recycle waste soils/materials on-site, where practicable and to promote sustainable waste and material resource management.	Waste soils/materials would be generated during construction through earthworks, tunnelling and foundation installation.	Further assessment of the ground conditions to be completed as appropriate. Requirement for re-use of site-won materials to be included in the detailed design as appropriate. The 'as constructed' Scheme is in accordance with the	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			Principal Contractor to construct the Scheme in accordance with the submitted design and planning applications.		submitted design and planning applications.		
Pipeline GC5	CH 10	To effectively manage the re-use of waste soils/materials across the Scheme during construction.	Further assessment of the ground conditions underlying the Scheme to be undertaken through ground investigation to provide information for soil re-use, as required. Principal Contractor to manage materials in accordance with appropriate waste management legislation and guidance and to promote sustainable waste and material resource management in line with the Government's waste hierarchy to allow the re-use of suitable soils during the construction works, as required. Management measures to be implemented as appropriate in this CEMP.	Waste soils/materials would be generated during construction through earthworks.	Further assessment of the ground conditions to be completed as appropriate. Principal Contractor to document the re-use of excavated materials, in accordance with appropriate legislation and guidance. Soil management measures included	P, C	Initial: Date:

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					within this CEMP, as appropriate.		
Pipeline GC6	CH 10	To reduce soil erosion and compaction during construction works.	- Minimising the area and duration of soil exposure and timely reinstatement of vegetation or hardstanding to prevent soil erosion and reduce temporary effects on soil compaction; - Stockpile management (such as water spraying and avoiding over stockpiling to reduce compaction of soil and loss of integrity) to reduce soil erosion, windblown dust and surface water run-off as appropriate; - Implementation of appropriate dust suppression measures to prevent soil erosion; - Implementation of appropriate working methods during earthworks to ensure that there is no uncontrolled run-off from the material / waste stockpiles; and	Earthworks will be required for the construction of the Scheme which may result in soil erosion and soil compaction.	Mitigation measures included within this CEMP and implemented during the construction works, as appropriate.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			Implementation of an appropriate MMP to document how excavated materials will be managed.				
Pipeline GC7	CH 10	To reduce ground stability hazards and protect structures from compaction/settlement.	Further assessment of the ground conditions underlying the Scheme to be undertaken through ground investigation, as required. Principal Designer to incorporate appropriate geotechnical mitigation/remedial measures in the design to reduce impacts from ground instability and soil compaction/settlement as required such as along the directionally drilled pipeline sections. Principal Contractor to construct the Scheme in accordance with the submitted design and planning applications. The Scheme will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques.	Requirement for mitigation/remedial measures to be determined based on further assessment of ground conditions as part of detailed design.	Further assessment of the ground conditions to be completed as appropriate. Mitigation/remedial measures to be included in the detailed design as appropriate. The 'as constructed' Scheme is in accordance with the submitted design and planning applications.	A	Initial: Date:

Landscape and visual

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline LV1	CH11	Limit damage to existing trees, shrubs, hedges and other significant vegetation to be retained on site.	The Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) prepared alongside the detailed design stages of the Scheme define the requirements and methods to be used to ensure protection in the construction period. All tree root protection areas identified, shall be protected by protection fencing in accordance with BS 5837:2012.		Mitigation measures included in this CEMP. Protection to be reviewed and monitored on site an Arboricultrist or ECoW.	P, C	Initial: Date:
Pipeline LV2	CH11	Limit damage to existing trees, shrubs, hedges and other significant vegetation to be retained.	The layout and construction of site compounds, soil storage areas, haul routes and any other construction site requirements to be designed and planned to ensure minimal impact on existing vegetation to be retained. Allow appropriate clearance from the edge of retained vegetation to minimise the requirement for cutting back or tree surgery. Requirements of which should be agreed with an Arboricultrist or ECoW.		Mitigation measures included in this CEMP.	P, C	Initial: Date:

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Pipeline LV3	CH11	Limit damage to existing trees, shrubs, hedges and other significant vegetation to be retained.	Where open cut sections of pipeline or proposed access routes cross an existing hedge, area of scrub or tree belt, existing gaps will be used where practicable so that vegetation removal is minimised. Proposed shaft locations should be located within open areas to avoid loss of trees and vegetation where practicable. No unnecessary tree or shrub removal will be undertaken, and vegetation which is to be removed will be marked and agreed on site with the ECoW prior to any felling.		Mitigation measures included in this CEMP. Vegetation to be removed to be agreed on site with ECoW.	P, C	Initial: Date:
Pipeline LV4	CH11	Limit damage to existing vegetation and grassland areas	A working area will be defined and agreed before construction commences. The area is to be marked on site by fencing with agreed access points. No works, vehicular access or storage will be permitted outside of the agreed working area. The working area is to be agreed and monitored by the ECoW. Materials and machinery will be stored tidily during the works.		Mitigation measures included in this CEMP. Working area to be agreed preconstruction and monitored on site by the ECoW.	P, C	Initial: Date:
Pipeline LV5	CH11	Reinstatement of landscape	A Landscape Reinstatement plan has been prepared as part of the planning submission. This includes details of planting and seeding to restore the affected		Mitigation measures included in this CEMP.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		disturbed by the works.	landscape areas as well as giving details of all mitigation planting required. This will be implemented to restore all landscape areas affected by the construction works and to provide additional mitigation planting to reduce landscape and visual effects. To be monitored and inspected on site.				
Pipeline LV6	CH11	Reinstatement of landscape disturbed by the works.	Topsoil and subsoil will be replaced (using existing topsoil and subsoil removed and stored during excavation) and evenly spread. Areas of disturbed earth will be re-graded to blend with the surrounding landform, cultivated and seeded or replanted.		Mitigation measures included in this CEMP.	P, C	Initial: Date:
Pipeline LV7	CH11	Reinstatement of landscape disturbed by the works.	Operations should be designed so that they can be progressively restored as the works commence. Areas will be reinstated as soon as the section /phase of works is complete, to minimise and reduce effect on visual amenity.		Mitigation measures included in this CEMP.	P, C	Initial: Date:
Pipeline LV8	CH11	Reinstatement of landscape	Where removal of sections of scrub, hedgerows and trees are unavoidable, appropriate tree and hedge species will be replanted along the line of the existing hedge or within the area of scrub. These will be		Mitigation measures included in this CEMP.	P, C	Initial: Date:

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		disturbed by the works	managed to restore the area to its pre-construction state.				
Pipeline LV9	CH11	Implementation of mitigation planting and seeding.	Ensure mitigation planting is implemented to provide enhancement and replacement of landscape and habitats, as well as integrating The Scheme into its surroundings and providing screening functions. Planting plans to be prepared in coordination with the Biodiversity requirements. Implementation is to be monitored and inspected on site.		Mitigation measures included in this CEMP.	P, C	Initial: Date:
Pipeline LV10	CH11	Implementation of mitigation planting and seeding.	Mitigation planting and seeding is to be implemented in advance or as soon as practicable following completion of each area, section or phase of works. This is to ensure any temporary period of effects is reduced and mitigation planting has longer to establish before completion of the works. A strategy for advance and phased mitigation planting / landscape reinstatement should be developed in the detail design stage. The strategy should be reviewed within the construction period and updated regularly		Strategy of advance planting to be agreed preconstruction and reviewed throughout the construction period.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			to take advantage of any areas where the programme of planting works can be brought forward.				
Pipeline LV11	CH11	Successful establishment of mitigation planting and seeding.	A five-year aftercare period for all soft landscape is to be included within the construction contract to ensure successful establishment. Maintenance within the period to be carried in accordance with an agreed management plan, maintenance specification and maintenance schedule to be developed and agreed in the detailed design stages. Records of all maintenance actions to be kept by the contractor /management company and provided for regular inspection when requested. Regular inspection and site monitoring to be undertaken throughout the period to ensure establishment targets are being achieved.		Management Plan, maintenance specification and schedules to be agreed and put in place prior to commencement of aftercare period. Regular inspection and site monitoring to be undertaken throughout the construction period.	C, O	Initial: Date:
Noise and vibration							
Pipeline NV1	CH12	To limit and control noise emissions	Works will be carried out in accordance with the Best Practicable Means, as defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the	To minimise the emission of noise from the site	Specification of plant noise level	P, C	Initial: Date:

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		during construction to avoid direct and indirect impacts on Community and receptors.	Environment Protection Act 1990, and noise control measures, as suggested by BS 5228 Part 1 Only plant which complies with the relevant EU/UK noise limits applicable to that equipment or is in no way noisier than would be expected from the noise levels quoted in BS 5228: 2009+A1:2014 Part 1 will be used. This would include all vehicles and mechanical plant used for the purpose of the works to be fitted with effective exhaust silencers and maintained in good and efficient working order; All compressors and generators should be 'sound reduced' models fitted with properly lined and sealed acoustic covers which should be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools should be fitted with mufflers or suppressers of the type recommended by the manufacturers and should be kept in a good state of repair;				

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			Machines in intermittent use should be shut down in the intervening periods between work, or where this is impracticable, throttled down to a minimum; Where practicable, plant with directional noise characteristics should be positioned so as to minimise noise at adjacent properties; The works covered by this application will be planned so as to ensure that as much work as practicable (taking into account the needs to minimise disruption to trains when the pipeline crosses the rail line and ensuring the safety of the public and workforce) takes place during normal daytime working hours; Ensuring that all staff and operatives are briefed on the requirement to minimise nuisance from site activities, via tool box talks etc.; Regular plant maintenance; all plant and equipment should be examined daily, for defects prior to the start of works and under no circumstances should defective plant be used;				

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			Avoid any reversing on site as far as reasonably practicable – if reversing is required, utilise broadband low impact reversing alarms or banksmen. Where practicable, use a ‘dead rolling’ method when vibratory rollers are required for compaction activities or road resurfacing close to properties. Use vibration-generating equipment at the minimum vibration amplitude.				
Pipeline NV2	CH12	To limit and control noise emissions during construction to avoid direct and indirect impacts on Community and ecological receptors.	Use of temporary noise screens or partial enclosures around particularly noisy activities, for example pneumatic breakers used in close proximity to dwellings	Current assessment shows potential for significant night time impacts at receptors on Swanmore Road.	Specification of noise barriers in this CEMP	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline NV3	CH12	Avoid night-time impacts	Avoid night-time works where practicable, particularly in proximity to receptors on Swanmore Road. Where night-time works cannot be avoided, acoustic screens should be erected to block line-of-sight between the plant and receptor to minimise impacts as far as reasonably practicable.	Current assessment shows potential for significant night time impacts at receptors on Swanmore Road.	Included in this CEMP	P, C	Initial: Date:
Pipeline NV4	CH12	Reassess Noise and Vibration Impacts	Reassess noise and vibration impacts if the method of working, plant and programme have been altered.	Current assessment shows potential for significant impacts	New assessment	P	Initial: Date:
Pipeline NV5	CH12	Undertake building surveys	Agree thresholds for vibration levels and durations of works with the local authority and determine if undertaking building surveys before and after works generating vibration in close proximity to sensitive receptors is appropriate	Current assessment shows potential for significant vibration impacts when works are very close to receptors	Ensure works do not cause cosmetic building damage	P, C	Initial: Date:
Pipeline NV6	CH12	Noise and vibration monitoring	Undertake targeted monitoring of noise and vibration levels when works are in close proximity to sensitive receptors. Frequency and locations to be agreed with local authority	Ensure works do not cause significant noise or vibration impacts	Report measured levels to the local authority within an agreed timeframe	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline NV7	CH12	To limit and control noise emissions during construction to avoid direct and indirect impacts on Community and ecological receptors.	Agree thresholds for noise levels and durations of works with the local authority above which noise insulation or temporary rehousing will be offered to affected residents	Current assessment shows potential for significant impacts at receptors, dependant on duration of works	Included in this CEMP	P	
Traffic and transport							
Pipeline TT1	CH13	Minimise impact of HGV traffic on highway network.	Prepare a Construction Traffic Management Plan to manage the impact of HGV traffic on the highway network.	Impacts on local road network from HGV traffic.	To be submitted for planning.	P	Initial: Date:
Pipeline TT2	CH13	Minimise impact of construction	Manage hours of working to avoid the import or export of goods and materials in network peak hours.	Impacts on local road network from HGV traffic.	To be included within CTMP	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		traffic during typical network peak hours					
Pipeline TT3	CH13	Minimise use of construction routes on local roads.	Utilise the Strategic Road Network where practicable for the import and export of goods and materials.	Impacts on local road network from HGV traffic.	To be included within CTMP	P, C	Initial: Date:
Pipeline TT4	CH13	Minimise use of construction routes on local roads.	Utilise the northern access where practicable for the import and export of goods and materials.	Impacts on local road network from HGV traffic.	To be included within CTMP	P, C	Initial: Date:
Pipeline TT5	CH13	Minimise the impact of construction traffic and road closures / diversions.	Develop construction sequencing plan with Local Highway Authority to reduce impact of closures.	Impact on local roads during construction of pipeline.	To be included within Phasing Plan	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline TT6	CH13	Minimise the impact of PRow closure / diversion.	Finalise alternative routing strategy for PRow and ensure diversions are suitable are as accessible as existing PRow.	It is assumed there is mitigation to prevent significant effects relating to PRow closures.	To be included within CTMP	P, C	Initial: Date:
Pipeline TT7	CH13	Minimise staff car trips	Use mini-bus / shuttle bus to transport staff to and from pipeline from welfare facilities.	To minimise the need for welfare facilities on pipeline route.	To be included within CWTMP	P, C	Initial: Date:

Material resources and waste

Pipeline MRW1	CH14	To manage wastes effectively in accordance with the waste hierarchy and waste regulations.	Principal Contractor to produce a Site Waste Management Plan (SWMP) with planned waste management for forecast wastes and monitoring of actual waste management during construction including the waste codes, quantities and destination of wastes removed from the site.	N/A	The Principal Contractor's SWMP will act as the record of waste management. Waste Transfer Notes (WTNs) and Hazardous Waste Consignment Notes	P, C	Initial: Date:
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Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
					(HWCNs) will need to be kept for a minimum of two and three years respectively.		
Pipeline MRW2	CH14	To effectively reuse excavated materials .	Principal Contractor to promote sustainable waste management in line with the Government's waste hierarchy to allow the re-use of suitable soils during the construction works.	This is the preferred approach for reuse of excavated materials on-site.	Performance and reporting will be through the Principal Contractor's SWMP.	C	Initial: Date:
Pipeline MRW3	CH14	To minimise construction and demolition waste disposed of at landfill.	Aim to recover 95% by weight of non-hazardous construction and demolition waste in accordance with the Hampshire Minerals and Waste Plan 2013. This action will be monitored through the SWMP.	Target does not include excavation materials (i.e. 17 05 04) or hazardous wastes.	Performance and reporting will be through the Principal Contractor's SWMP.	C	Initial: Date:
Pipeline MRW4	CH14	To ensure vegetation and wood and timber arising	Principal Contractor to develop a strategy for managing vegetation, wood and timber in accordance with the waste hierarchy. The strategy will need to identify how timber will be graded, processed and	Principal Contractor is responsible for management of stripped vegetation	Management of wastes will be reported through the	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		from construction is managed effectively.	stored to maintain its quality. Opportunities to reuse the timber within the Scheme or interested third parties will need to be explored.	and wood and timber arising from unavoidable woodland loss.	Principal Contractor's SWMP.		

Water environment

Pipeline W1	CH9, CH15	To protect watercourses and groundwater from construction related pollution risk	- Additional pollution control/interception which should be taken into consideration: - Dewatering flows will need to comply with any associated permits or regulatory position statements and groundwater quality sampling may be required prior to discharge. - Volumes of bentonite recirculation will need to be observed to identify any potential excessive losses of material, i.e., losses of bentonite more than is to be expected from the method applied. - Refuelling and machine repairs will be undertaken in bunded areas. Any parked	Contractual responsibilities between Portsmouth Water and PC. Pollution prevention measures are detailed within this CEMP. The PC will have access to relevant guidance material.	No reportable incidents of construction related watercourse pollution above thresholds	P, C	Initial: Date:
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Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			machinery will use oil trays or parked on areas with interceptor membrane installed. No chemicals / fuels will be stored in close proximity of any watercourses. If not practicable, then chemicals / fuels will be stored in bunded areas. Any chemicals, such as bentonite, used in the construction process will need to be used in a controlled manner. Note, bentonite is a non-Newtonian fluid and therefore if exposed to groundwater will become immobile within the aquifer, which is a mitigating measure in bentonites application. In addition, consultation between WBCL and Portsmouth Water production and water quality teams has begun on suitable tunnelling products (such as lubricants and polymer slurry conditioners). At this early-stage practicable products which are safe to use in vicinity to the borehole abstractions have been				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			identified and proposals on their use will be made during detailed design. - When working in proximity to sensitive receptors, such as the Bedhampton springs, any tunnelling and shaft construction method will have to be adapted or tailored to potential artesian conditions, where the strata may be in hydraulic continuity with the underlying Chalk, to ensure no new pathways are created to allow potential pollutants are able to enter the aquifer. - In addition, particular care will need to be taken with shaft sinking and tunnelling at the southern end of the pipeline corridor where shallow groundwater in the South Hants Lambeth Group groundwater body and artesian Chalk groundwater from the East Hants Chalk groundwater body may be encountered. In addition, particular care will also be needed within the pipeline				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			excavations, tunnelling and shaft sinking where shallow water is expected, Head Deposits, Bognor Sands and Alluvium deposits. Tunnelling, trench excavations and any shafts will need to be designed in accordance with industry standards. A risk assessment will need to be carried out to ensure the selected excavation / tunnelling method does not introduce contamination pathways into the aquifer. The design will include a contingency plan in the event that artesian groundwater flow is encountered. Dewatering flows will need to comply with any associated permits or regulatory position statements and groundwater quality sampling may be required prior to discharge. In context of a sensitive Secondary A and Principal Aquifer used for drinking water, construction and operational discharges to groundwater will be avoided. For access roads, road runoff drainage systems will be designed to minimise runoff soakaway				

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			drainage to ground and pollution control measures will be installed on all access roads. - A risk assessment will be carried out to ensure excavation methods do not introduce contamination pathways into the aquifer. The design will include a contingency plan in the event that artesian groundwater flow is encountered and detailed within the risk assessment, inclusive of any monitoring requirements. - Inclusion of specific sediment management measures to protect hydromorphology, the sediment plan will also take into account of movement of sediments from site to truck and truck to offsite.				
Pipeline W2	CH9, CH15	To protect watercourses from construction related pollution risk	In-river construction work will avoid periods of higher flows i.e. outside of March to September periods. Construction will be undertaken when flows are at or below the mean average as far as practicable to reduce the potential for sediment release and risk of	Contractual responsibilities between Portsmouth Water and PC.	No reportable incidents of construction related watercourse pollution above thresholds	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			scour and using appropriate methods to reduce the risk of pollution if flows were to increase suddenly. There will be no storage/stockpiling of fuels, earth, gravel or other materials in close proximity of watercourses that may cause pollution along the pipeline corridor. All soils/materials excavated within the pipeline corridor are directly placed into a vehicle and taken away for offsite storage. Provision for measures to be agreed with Portsmouth Water will be made for the following during pipeline construction and may require the following: • Water quality monitoring of the Bedhampton and Farlington springs, water quality sondes with continuous monitoring of key physiochemical parameters with key triggers/alarms. • Groundwater monitoring equipment installed into a borehole at Bedhampton to assist with construction of the UTX tunnel.	This measure will be detailed in this CEMP.			

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			The GI near Bellway Homes site will include a borehole targeting the Chalk where water monitoring and/or sampling will take place.				
Pipeline W3	CH9, CH15	To improve river habitat connectivity in line with WFD waterbody objectives	The following measures will be undertaken as part of pipeline corridor crossing: Flow will be maintained for downstream habitats through a flume/overpumping during the in-river works. The riverbed at the location of pipeline corridor crossing will be restored using finer materials (gravel, pebbles, cobbles) which will be placed on top of the concrete seals Noise, vibration and light spill will be minimised by working back from the watercourses where practicable. Construction lighting will be angled away from the watercourse to reduce the potential for disturbance. Where practicably practicable percussive (hammer) piling shall be avoided in favour of softer alternatives	Contractual responsibilities between Portsmouth Water and PC. This measure will be detailed in this CEMP.	Agreement with the Environment Agency.	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			(e.g. silent sheet piling, vibratory sheet piling). Where this is not practicable, soft start piling procedures will be utilised to provide time for fish to locate away from the source of disturbance prior to full exposure. It is advised that the soft-start duration should be a period of not less than 20 minutes. All piling activities should ideally be of a period no greater than 20 minutes. Following the cessation of piling activities, the soft start procedure should be repeated. The majority of shallow excavation is expected in Head Deposit material, which is highly variable, and alluvial deposits. Gravels from the headwater streams impacted will be moved to Southleigh Forest nearby headwater systems to try and mitigate against the loss of Near Threatened, nationally notable and scarce macroinvertebrate species on site, notably in Headwater Streams 1 and 2, where higher numbers of notable species were recorded. Hand netting of macroinvertebrates will also be undertaken and these will be released in the upper part of Headwater	Mitigation and compensation for geomorphological impacts identified as part of the Havant Thicket Reservoir WFD assessment have been incorporated within Mitigation & Compensation 'Package 2'. Portsmouth Water progressing this mitigation.			

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			Stream 2; and headwater streams in Southleigh Forest and Hollybank Wood. Enhancing the 250 m of new habitat in the relict Riders Lane Stream between the reservoir embankment and the confluence of the compensation flow to provide both in-channel and backwater features. Additional backwater habitats in Riders Lane Stream for refugia for fish in case of operational drawdown events.				
Pipeline W4	CH9, CH15	To maintain / improve habitat connectivity	The following measures will be undertaken as part of pipeline culvert upgrades: An inverted entry/exit will be implemented to new culvert pipes along with the installation of soft habitats within the pipe to improve watercourse connectivity.	Contractual responsibilities between Portsmouth Water and PC. This measure is set out in the Mitigation &	Agreement with the Environment Agency.	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			As set out above, additional backwater habitats will be created in Riders Lane Stream to serve as refugia for fish in case of operational drawdown events.	Compensation 'Package 2'. Portsmouth Water progressing this mitigation.			
Pipeline W5	CH15	To protect river geomorphology	Riverbanks outside of the spillway are not to be re-profiled and any bank damage resulting directly or indirectly from the works is to be repaired so as to restore it to its former condition. This includes stabilisation replanting of riparian vegetation to prevent soil run-off and erosion. Any temporary works to be placed in the watercourse or within 8m metres of the bank of the watercourse shall be also entirely removed on completion of the works.	Contractual responsibilities between Portsmouth Water and PC.	Agreement with the Environment Agency.	C	Initial: Date:
Pipeline W5	CH15	To protect river geomorphology	The structure containing the Emergency Discharge Valve will not exceed 10 x 15m in size. The design will not compromise the Hermitage Stream reach upstream of Riders Lane Stream, which has already been restored and since naturalised.	Contractual responsibilities between Portsmouth Water and PC.	Agreement with the Environment Agency.	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			The pipeline corridor width will not exceed 20 m (40m within Staunton Country Park to accommodate turf translocation). The extent of riverbank affected by riparian vegetation clearance is up to 10 m, with replanting undertaken.				
Pipeline W6	CH15	To protect River Lavant water quality.	Water expected to be discharged to the River Lavant from headwater streams and dewatering activity will be monitored to be undertaken to determine treatment requirements prior to discharge.	Contractual responsibilities between Portsmouth Water and PC.	No reportable incidents of construction related watercourse pollution above thresholds set.	P, C	Initial: Date:
Pipeline W7	CH15 CH9	Enhancement Measures	Inclusion of the following measures will provide enhancement opportunities within the water environment: Creation of wetland habitat within the northern edge of the reservoir to attract a range of wildlife and birds.	Contractual responsibilities between Portsmouth Water and PC.	Ongoing water quality and ecology data reviews.	O	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
			Compensation flow maintained during operation to provide the opportunity to maintain year-round flows within watercourses.				

Effects on climate

Pipeline EC1	CH16	To reduce greenhouse gas emissions associated with the production and transportation of materials	Materials will be sourced onsite or from the local area as far as practicable.		Statement from Design Team stating quantity of materials required to construct the Scheme and quantity of materials sourced from site-won materials. The Scheme 'as constructed' is in accordance with the submitted design and planning applications.	P, C	Initial: Date:
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Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Vulnerability to climate change							
Pipeline VCC1	CH17	Avoid and reduce impacts from flooding brought about by extreme weather or during wetter winters.	Follow actions and commitments set out in FRA to avoid flooding brought about by extreme rain or during wetter winters (to be implemented by the drainage strategy plan, construction environment management plan and flood risk activity permits).			A	Initial: Date:
Population and human health							
Pipeline PHH1	CH18	To maintain active travel and safe access to open space, opportunities for recreation & leisure, healthcare, education &	Retain existing pedestrian accesses where practicable. Maintain safe access through traffic marshalling, traffic management and use of fencing to separate the public from construction activity and traffic.	N/A	No more than 1 minor injury per month and no major injuries. Daily site audits by a representative from the Principal Contractor.	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		other social infrastructure and to work & training			Measures to be included within CTMP to be agreed by LPA.		
Pipeline PHH2	CH18	To minimise the adverse effect on active travel and on access to open space, access to opportunities for recreation & leisure and access to work & training.	Keep the public informed on project progress and on the timing and extent of road/footpath/PROW/amenity spaces closures/diversions	N/A	Measures to be included within CTMP to be agreed by LPA	C	Initial: Date:
Pipeline PHH3	CH18	Access to open space and to opportunities	Keep amenity spaces open to the public where practicable and minimise the time required to occupy amenity space.	N/A	Development to be implemented in accordance with a construction phasing	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		for recreation and leisure			plan to be agreed by the LPA.		
Pipeline PHH4	CH18	To minimise the adverse effect on active travel and safe access to open space, to opportunities for recreation & leisure and to work & training	Carefully programme the work on pipeline works and on culvert upgrades to minimise the impact of road closures and traffic management.	There is flexibility in the programme to undertake works outside of the peak hours	Measures to be included within CTMP to be agreed by LPA	C	Initial: Date:
Pipeline PHH5	CH18	To minimise the adverse effect on active travel and safe access to open space, to opportunities	For each section of the pipeline, construction vehicles should only use routes identified in the Addendum to the Transport Assessment	N/A	Measures to be included within CTMP to be agreed by LPA	C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
		for recreation & leisure and to work & training					
Pipeline PHH6	CH18	Minimise the adverse effect from noise pollution and vibration	Keep the public and residents fully informed of the scale, nature and timing of the works	N/A	Mitigation to be included in this CEMP to be approved by LPA	C	Initial: Date:
Pipeline PHH7	CH18	To enhance access to work and training for local communities, the unemployed and low-income groups.	Identify opportunities to provide work and training	Portsmouth Water will engage with local agencies to maximise potential work and training opportunities during construction and operation of the Scheme.	Development is implemented in accordance with a scheme approved by the LPA.	C, O	Initial: Date:

Major accidents and disasters

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline AD1	CH20	To reduce risk of road accidents due to pipe leaks causing erosion of sediment or backfill, resulting in settlement.	Quality control of pipe connections by appointed contractor. Suitable pipe material selection for ground conditions and construction methods.	Appropriate pipe lining and coating (internal and external) to prevent premature erosion of pipe to be used.	No road accidents due to pipe leakage. Implementation of quality control by appointed contractor.	C, O	Initial: Date:
Pipeline AD2	CH20	To reduce risk of rail accidents due to pipeline crossing.	A detailed GI will be undertaken to inform design and construction of Under Track Crossing (UTX).	Full compliance with Network Rail's asset protection standards and guidance. Network Rail approved Principle Contractor to be appointed.	Outcome of GI to inform detailed design and construction of the UTX.	P, C	Initial: Date:

Ref	ES ref	Objective	Actions/commitments (incl. specific location and any monitoring required)	Assumptions (on which the action is based)	Achievement criteria and reporting requirements	When P - Pre-Construction C - Construction O - Operation A - All	Completion record
Pipeline AD3	CH20	To reduce risk of loss of control of flows into the pipeline from a pipe burst creating pressure waves upstream and flooding.	Monitoring system and telemetry connection to allow remote actuation of valves at reservoir will be implemented.	Valves in pipeline at reservoir outlet culvert to be automatically self-closing to prevent loss of control of flows Double isolation at Hermitage stream discharge point Reservoir valve actuators will have Uninterrupted Power Supply (UPS) power, provided from a battery in the control house, and will be manually operable.	Successful implementation of monitoring systems.	O	Initial: Date:

Appendix B: Key Legislation

	Key Legislation
Environment and Sustainability through Design	- Wildlife & Countryside Act 1981 - Conservation of Habitat & Species Regulations 2017(as amended) - Water Frameworks Directive 2000 - The Hedgerow Regulations 1997 - Flood and Water Management Act 2010
Ground Conditions	- Environmental Protection Act 1990 - The Environmental Permitting (England & Wales) Regulations 2016 - Construction (Design & Management) Regulations 2015 - Control of Substances Hazardous to Health (COSHH) Regulations 2002 - Flood and Water Management Act 2010
Landscape and Visual	- European Union Directive 2011/92/EU - The Guidance for Landscape and Visual Impact Assessment, Third Edition
Noise and Vibration	- Control of Pollution Act 1974 - Environment Protection Act 1990
Material Resources and Waste	- EU Directive 2008/98/EC on waste - Environmental Permitting (England and Wales) Regulations 2016 - Hazardous Waste (England and Wales) Regulations 2005 (as amended by the Hazardous Waste - Hampshire Minerals and Waste Plan 2013
Air Quality	- The Air Quality Standards Regulations 2010 - Air Quality (England) Regulations 2000 - Air Quality (England)(Amended) Regulations 2002 - UK Climate Change Act (2008) - Environment Protection Act 1990 - Best Practicable Means, as described in Section 79 (9)
Historic Environment	- Ancient Monuments and Archaeological Areas Act (1979) - Planning (Listed Buildings and Conservation Areas) Act 1990 - Construction (Design & Management) Regulations (CDM Regulations) 2015
Biodiversity	- EU Directive 2008/98/EC on waste - Environmental Permitting (England and Wales) Regulations 2016

	Hazardous Waste (England and Wales) Regulations 2005 (as amended by the Hazardous Waste (England and Wales) Amendment Regulations 2009 and 2016)
Water Environment	- The Environmental Permitting (England & Wales) Regulations 2016 - The Land Drainage Act 1991 - The Water Resource Act 1991 - Water Abstraction and Impounding Regulations 2017 - Water Frameworks Directive - Flood and Water Management Act 2010
Effects on Climate	UK Climate Change Act 2008
Population and Human Health	Public Health Energy Strategy 2020-25
Major Accidents and Disasters	Control of Major Accidents Hazards Regulations 2015.

Appendix C: Pipeline Route Overview



Appendix D: Environmental Management Checklist

Project Name:	Havant Thicket Reservoir Main Pipeline Works	Project Number:	C725		
		Date of Inspection:			
			Yes	No	N/A
Site Environmental Management System					
1. Is the company environmental policy available and displayed on site? - Is it up to date?					
2. Has the contract and client documentation been reviewed to identify the site-specific environmental requirements, including planning conditions and control procedures?					
3. Has a CEMP, Aspect & Impact register, SWMP, Baseline Questionnaire been prepared to identify the relevant objectives, issues and controls? Are they regularly reviewed?					
4. Has environmental issues been communicated to site team (including sub-contractors)?					
5. Has responsibilities for environmental management been made clear to duty owners					
6. Are all environmental licences and permits in place?					
7. Is there a suitable and sufficient monitoring regime in place to ensure that the site environmental requirements are being met (inspection and document review)?					
8. Are Environmental factors included in Risk Assessments?					
9. Are Environmental issues adequately addressed at site induction? Including briefing operatives of good Environmental practices?					
Waste Management, storage, and disposal					
10. Are there skips for segregation of waste onsite? If so, - Are they labelled accordingly? - Is COSHH waste skip/bin available? - Is the skip made available for food waste covered?					
11. Is there a licenced waste removal sub-contractor appointed? If so, - Is the waste carrier registration available? - Have they completed the competence questionnaire?? - Do they provide waste transfer notes when they remove waste?					
12. Is hazardous waste removed responsibly from site? What arrangements are in place to remove hazardous waste?					
13. Are hazardous wastes (oil, fuel, paints, and so on) collected and stored separately from general wastes? - Are lids secured on all hazardous waste containers? - Is hazardous waste appropriately labelled?					
14. Have designated area(s) been established on site to segregate and reuse waste materials?					
15. Do waste transfer documents include the right information (six-digit waste codes, licence number of carrier, tip location and declaration regarding the waste hierarchy)? - Are hazardous waste consignment notes (HWCN) obtained for hazardous waste?					
16. Are waste transfer documents being retained: if sent to Ireland Office, call and confirm retaining period. Two years for non-hazardous and three years for hazardous waste?					
17. Spill Prevention: - Is the area free of spills? - Is the area free of other housekeeping issues?					
18. If spills were found: - Was the spill cleaned up properly?					

- Was the spill log and report completed?			
19. Spill Kits:			
- Are the spill kits on site complete?			
- Are the spill kits stored in appropriate locations?			
Statutory Nuisance			
20. Are appropriate dust suppression techniques used to minimise air pollution from timber sawing or planning, stone or block cutting, crushing, and so on?			
21. Is dust on site haul roads and material stockpiles dampened down adequately?			
22. Are site vehicle speed limits controlled to reduce dust?			
23. Have the works been assessed to identify the noise and vibration impact on local houses?			
24. Has the local environmental health officer and neighbours been consulted and forewarned of any out-of-hours or major disruptive activities?			
25. Have working hours been defined to restrict noisy operations to certain times of day?			
26. If a Control of Pollution Act Section 61 consent is required, are noise levels being recorded to ensure that levels are kept within limits?			
27. If possible, have working methods been reviewed to use equipment that reduces noise and vibration (such as pile jacking and chemical bursting)?			
28. Are deliveries planned to suit the local area?			
29. Is dewatering taking place on site			
If yes; - Is there a suitable plan in place to dewater onsite? - Is there a designated area where the water is going to be discharged? - Is dewatering activity going to take place for 6 consecutive months or more? - If so, have an abstraction permit been applied for? - Is a silt buster tank in place before water is discharged? - Does the tank the right dimension for the dewatering activity? - Is dewatering RAMS in place, if so, has it considered all scenarios & control measures? - Is a member of the project team tasked with monitoring the dewatering activity daily?			
Ecology/Biodiversity			
30. Has a Biodiversity Management Plan been produced?			
31. Has an Invasive Non-Native Species (INNS) Management Plan been produced if required?			
- Has a 7m exclusion zone been established in areas close INNS?			
32. Is adequate protection in place for existing planted areas?			
33. Has an appropriate Ecological Clerk of Works (ECOW) or Environmental Clerk of Works (ENVCOW) been appointed if required?			
34. Have pre-construction surveys been carried out for vegetation clearance?			
- These surveys are to be carried out by a competent person in the fields of ecology, arboriculture, etc.			
35. Has appropriate toolbox talks been carried out in relation to vegetation removal?			
36. Has vegetation removal been carried out within the appropriate timeframe?			
- This is to mitigate the impact of vegetation removal during nesting season which typically runs from March to the end of August.			

37. Are works within, adjacent, or likely to affect a designated area? (e.g. SAC, SINC, Nature Reserve, Ancient Woodland). If yes: - Has an adequate buffer boundary been established? - Has the relevant LPA been informed where necessary? - Has permission been granted by the LPA? - Have relevant licenses been obtained? (if so please specify)			
38. Have surveys been carried out to identify the presence of any protected fauna and within the construction area? - Have mitigation measures been implemented to protect fauna if present?			
39. Has the design stage incorporated the protection of ecology & biodiversity within the project?			
40. Have provisions to achieve 10% Biodiversity Net Gain (BNG) been implemented?			
41. Are watercourses in the site area free from signs of pollution? - Are concrete washouts located at least 10m from watercourses? - Is fuel storage at least 10m away from watercourses?			
Sub – contractor & supply chain			
42. Are sub – contractor carrying out work on behalf of Ward & Burke?			
43. Have all environmental arrangement been shared with them			
44. Are sub – contractor organisation adhering to the systems in place and are they helping Ward & Burke achieve their environmental objectives?			
Emergency Preparedness			
45. Are fire extinguishers / fighting facilities properly maintained and not expired? Escape not blocked / obstructed?			
46. Is there a system for sites to deal with environmental emergencies (such as for spillages and groundwater contamination) and for notifying them to the relevant authority?			
Comments & Actions			

	Signature:	