Appendix B: Mitigation Provisions
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B.1 Assessment and Planning

The nominated undertaker or any contractor will undertake the works and implement working methods which will be developed to protect surface and groundwater from pollution and other adverse impacts including change to flow volume, water levels and quality. This will be completed in accordance with relevant legislative requirements and accepted industry practice. The nominated undertaker will prepare a strategy for handling water resources issues which will be agreed with the Environment Agency (EA) as part of the construction planning process.

Water Management Plans will be produced for each of the construction sites and will take account of the guidance contained within the relevant Pollution Prevention Guides (PPG) issued by the EA and other Construction Industry Research and Information Association (CIRIA) documents. Specific receptors in the water environment will be listed in the plans. Where appropriate integrated aquatic ecology and water quality plans will be developed.

Contingency plans to deal with major pollution incidents at the work sites will be included within the overall emergency planning. EA guidance on pollution incident response planning will be reflected in the emergency plans.

B.2 Site Drainage

Site drainage, including surface runoff and dewatering effluents, will be discharged to sewers where possible, after any required treatment, and relevant permissions will be obtained from the statutory undertaker. Discharge to watercourses will only be permitted where discharge consent or other relevant approval has been obtained.

Site drainage will meet the effluent standards required by the sewerage undertaker or Environment Agency (EA) as appropriate, and holding or settling tanks, separators and other measures will be provided as may be required.

The relevant sections of BS6031: Code of Practice for Earthworks for the general control of site drainage will be followed.

B.3 Protection of Watercourses

Approval will be obtained in advance for all crossings of, diversions to, and work within statutory buffer zones for watercourses from the EA or other appropriate body.

Protection measures for works in or adjacent to watercourses will be provided in accordance with appropriate requirements.

Watercourses, including land and/or road drainage, within the construction sites will be maintained to provide effective working conditions at all times.
All reasonably practicable measures will be taken to prevent the deposition of silt or other material in, and the pollution by sediment of, any existing watercourse, canal, lake, reservoir, borehole, aquifer or catchment area, arising from work operations. The measures will accord with the principles set out in industry guidelines including the EA’s note ‘PPG05: Works in near or liable to affect watercourses’ and CIRIA’s report ‘C532: Control of water pollution from construction sites’. Measures may include use and maintenance of temporary lagoons, tanks, bunds and silt fences or silt screens as well as consideration of the type of plant used and the time of the year for working in watercourses.

Other than in the tidal Thames, sediment plumes from dredging in inland waterways, including those under control of British Waterways, will be controlled by measures in accordance with the principles set out in industry guidelines such as the CIRIA's Report 169 'Inland Dredging – guidance on good practice' and Section 6 of CIRIA's Report C547 'Scoping the assessment of sediment plumes from dredging’. Contaminated dredged material will be managed as described for other contaminated land materials.

**B.4 Control of Pollution of Surface Water**

Protection measures to control the risk of pollution to surface water will be adopted and will include, where appropriate and reasonably practicable:

- Any containers of contaminating substances on site will be leakproof and kept in a safe and secure building or compound from which they cannot leak, spill or be open to vandalism. The containers will be protected by temporary impermeable bunds with a capacity of 110% of the maximum stored volume. Areas for transfer of contaminating substances will be similarly protected.

- All refuelling, oiling and greasing will take place above drip trays or on an impermeable surface which provides protection to underground strata and watercourses and away from drains and watercourses as far as reasonably practicable. Vehicles will not be left unattended during refuelling.

- Only construction equipment and vehicles free of all oil/fuel leaks will be permitted on site. Drip trays will be placed below static mechanical plant.

- All wash down of vehicles and equipment will take place in designated areas and washwater will be prevented from passing untreated into watercourses and will comply with EA’s PPG13.

- EA note PPG 23 will be followed when carrying out maintenance of structures over water. As far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in or over watercourses.

- Appropriate measures to be taken to protect erodible earthwork surfaces.
B.5 Control of Pollution of Groundwater

Protection measures to control the risk of pollution to groundwater will be included within the overall strategy.

Where reasonably practicable and appropriate, the nominated undertaker or any contractor will avoid using materials in the permanent or temporary works that could pollute groundwater. This will include special consideration for any use of substances contained within List I and II of the Groundwater Regulations SI 1998/2746 (Groundwater Directive: 80/68/EEC). Materials likely to be in contact with the aquifer during tunnelling operations will be selected in accordance with appropriate industry practice.

B.6 Mitigation of Impacts at Abstraction Boreholes

The foregoing sections describe the measures used to minimise the risk of groundwater pollution. However, at any particular abstraction, there will be a residual risk that the water quality may become unusable by an abstractor. The following precautionary actions will be applied, where applicable, to limit and manage the residual risks;

- Routine water quality monitoring will be undertaken at abstraction sources. The period of monitoring and the parameters monitored will be appropriate to the timing and type of work undertaken. The need for intermediate monitoring holes and procedures for water and contaminant testing during construction and operation will be discussed with the owners.

- The nominated undertaker or any contractor will arrange any necessary monitoring of water levels in areas where dewatering of the deep aquifer is planned. The rights of existing abstractors will be recognised and consultation will be undertaken on measures to avoid loss or interruption of supply or provision of alternative supplies.

B.7 Dewatering

The foregoing provisions will also apply to dewatering, in addition to the following:

- Relevant licenses and consents will be obtained for dewatering wells.

- Records of water pumped will be kept at all major dewatering sites where wells are constructed in the deep aquifer or where required under the terms of a discharge consent.

- Water quality at all major dewatering sites will be monitored weekly for the first four weeks of pumping and monthly thereafter. Monitoring will comprise a laboratory test of major ions and a field test of temperature and electrical conductivity as well as other parameters required under the conditions of an abstraction or discharge licence consent or permit.
B.8 Monitoring and Mitigation of Water Levels in the Shallow Aquifer

Additional site investigation (SI) will take place and some SI boreholes will be converted to standpipes where significant changes in water levels in the shallow aquifer are expected as a result of temporary dewatering or construction of major structures which cut off the shallow aquifer and could cause water levels to rise. Selected water levels will be monitored for a maximum of twelve months after dewatering or construction of the cut off is completed. The monitoring data will be analysed in relation to data on elevations of nearby basements and existing drains. Additional drainage will be provided as mitigation where necessary.

B.9 Dredging

Dredging in the tidal River Thames will be carried out in accordance with the requirements set out by the Port of London Authority.

B.10 References


BS 6031: Code of Practice for Earthworks.

EA Pollution Prevention Guidance Notes.

CIRIA, Control of water pollution from construction sites: Guidance for consultants and contractors (C532).

CIRIA/Environment Agency Joint Guidelines: Concrete Bunds for Oil Storage Tanks.

CIRIA/Environment Agency Joint Guidelines: Masonry Bunds for Oil Storage Tanks.


SI 2001/2954: Control of Pollution (Oil Storage) Regulations 2001.

SI 2002/2677: Control of Substances Hazardous to Health Regulations.


CIRIA report R169: Inland dredging - guidance on good practice

PIANC Handling and Treatment of Contaminated Dredged Material from Ports and Inland Waterways, Report of Working Group 17.

PIANC Site investigation requirements for dredging works, Report of Working Group 23.