

12. Water Resources and Flood Risk

12.1 Introduction

- 12.1.1 This Chapter, which has been prepared by AECOM and Waterman, provides a statement of conformity with regard to the potential water resources and flood risk impacts arising from the Scheme with Phase 1B (North) in place (and having regard also to the detailed design previously approved in relation to Phase 1A (North)). This statement of conformity, with updated baseline and supporting information, is provided pursuant to the s73 ES and other EIA Documentation (as defined in **Chapter 4: Approach to the ES Further Information Report**) in light of the further detailed design information now available in respect of Phase 1B (North), and confirms whether the findings of the s73 ES and other EIA Documentation with respect to the likely significant effects, mitigation and residual impacts in relation to water resources and flood risk remain valid.
- 12.1.2 A review of relevant policy, legislation and guidance published since preparation of the s73 ES and other EIA Documentation has been carried out. A review of the detailed design for Phase 1B (North), as defined in **Chapter 2: Description of Phase 1B (North) RMA**, has then been undertaken, to identify elements of the Phase 1B (North) RMA of relevance to the water resources and flood risk assessment.
- 12.1.3 The approach to the statement of conformity is set out and a summary of relevant consultation is provided. A review of the baseline information presented in the s73 ES and other EIA Documentation has been undertaken and updates are presented where relevant. Commentary is then provided which confirms whether any new or different potential impacts arising from the Development (comprising the Scheme with the detailed design for both Phase 1A (North) and Phase 1B (North) in place) from those identified previously are likely. Likewise, any new or different mitigation measures from those identified previously are presented where considered necessary, and residual impacts following the application of mitigation are described.
- 12.1.4 An addendum to the s73 Flood Risk Assessment (FRA) (BXC16), incorporating information specific detailed design information for Phase 1A (North) and Phase 1B (North), and an updated Water Framework Directive (WFD) Assessment have been prepared by AECOM. These reports have been provided as appendices (**Appendices 12.1 and 12.2**) and are referred to within this chapter.
- 12.1.5 The following technical material has been provided in support of this Chapter:
- **Appendix 12.1:** Flood Risk Assessment (FRA) Addendum – Detailed Design Phase 1B North;
 - **Appendix 12.2:** Water Framework Directive Assessment – Detailed Design Stage;
 - **Appendix 12.3:** Factual Groundwater Monitoring Report; and
 - **Appendix 12.4:** Environment Agency Consultation.

12.2 Policy, Legislation and Guidance

- 12.2.1 There have been no significant changes to policy, legislation or guidance since the s73 ES and other EIA Documentation was prepared which have a material effect on the approach to, or findings of the assessments previously presented.

12.2.2 Climate change allowances were updated by the Environment Agency in February 2016. However, the Environment Agency have confirmed that the original outline permission granted and the subsequent s73 application were approved based on previous flood risk assessments and associated layouts / design / parameters (refer to **Appendix 12.4**). The EA have agreed that the already approved flood risk assessment (BXC 16) still applies, therefore flood risk hasn't been assessed further based on the latest climate change guidance.

12.3 Relevant Phase 1B (North) RMA Details

12.3.1 Key elements of the Phase 1B (North) RMA of relevance to water resources and flood risk are set out below. It should be noted that the diversion and realignment of the River Brent (along with the landscape design of Reach 2 (the Central Riverside Park)) was approved in outline as part of the 2014 Permission and was assessed in the s73 ES and approved in detail as part of the Phase 1A (North) RMAs.

- **Transport Interchange T2:** Replacement Brent Cross Bus Station;
- **Plot 113:** Residential development to be located on Plot 113;
- **Brent Cross East Development Zone:** comprising a series of development plots to the south, west and east of the existing Brent Cross Shopping Centre, around High Street North and Brent Cross Main Square containing a mix of uses including retail, leisure, food and beverage, hotel, and community floorspace, in addition to an energy centre and, supported by multi-storey car parks. Refurbishment works are also proposed within existing Brent Cross Shopping Centre, such as reconfiguring existing retail units, removal of the existing mall roof lights and replacement with new features, renewal and replacement of mall floor finishes, increasing the height of existing shopfronts and external alterations to the exterior of the shopping centre where it meets the new plots. The existing shopping centre has been considered due to the integrated nature of the drainage design; and
- New areas of Public Realm and Open Space to be provided as part of Phase 1B (North) as detailed in **Chapter 2: Description of the Phase 1B (North) RMA**, including improvements to the existing **Sturgess Park** and the **Riverside Park (Reaches 1 and 3)** and **Nature Park 4 (NP4)**.

Other Relevant Details

12.3.2 In addition to the above, consideration has been given to other relevant details now available, including the Generic Quantitative Geo-Environmental Assessment (GQRA) for Phase 1B (North) showing the results of the Site Investigation carried out in 2016 (and completed in March 2017) (refer to **Appendix 15.2** and **Chapter 15: Ground Conditions** for further details).

12.4 Assessment Methodology

12.4.1 There have been no significant changes to planning policy, legislation or guidance which materially affect the approach to the water resources and flood risk assessment presented in the s73 ES and other EIA Documentation. When assessing the potential impacts in relation to water resources and flood risk for the Phase 1A (North) RMAs, it was deemed appropriate to apply the methodology for the Design Manual for Roads and Bridges (DMRB). Although this methodology

was originally developed in respect of highways, the overall approach is also deemed suitable to assess potential impacts in relation to the wider Development. Therefore, the methodology and significance criteria previously presented in the s73 ES and other EIA Documentation (specifically, the Phase 1A (North) FIR) have not changed and therefore remain valid for the purposes of assessing the detailed design for Phase 1B (North) in the context of the overall Development.

- 12.4.2 The baseline conditions presented in the s73 ES and other EIA Documentation have been reviewed by Waterman and AECOM to determine whether there have been any significant changes which could affect the findings of the assessment. Updated baseline water monitoring results have been summarised within this Chapter and are presented in full as **Appendix 12.3**.
- 12.4.3 In considering the Phase 1B (North) RMA proposals, an assessment based on the methodology applied in the s73 ES and other EIA Documentation, as outlined above, has been applied, to consider the potential impact of any changes from the 2014 Permission taking into account updated supporting information now available. This has enabled the confirmation of whether or not the impacts presented in the s73 ES and other EIA Documentation remain valid, and if necessary the identification and assessment of any new impacts.

Limitations and Constraints

- 12.4.4 No limitations or constraints were identified within the assessment.

12.5 Consultation

- 12.5.1 The approach to the Water Resources and Flood Risk Chapter was set out in the EIA Scoping Report (**Appendix 4.1**). The approach to the assessment was considered acceptable by LBB (see **Appendix 4.2**).
- 12.5.2 The design team for Phase 1 (North), the Environment Agency, Thames Water, Transport for London (TfL) and London Borough of Barnet (LBB) have been engaged in discussions throughout the development of the detailed design for Phase 1B (North) to ensure that the proposals meet with relevant environmental and policy standards and requirements. Consultation responses from the Environment Agency in relation to the climate change guidance is included as **Appendix 12.4** as referenced above.

Consenting Process

- 12.5.3 Works within 8m of the banks of the River Brent require a Flood Risk Activity Environmental Permit (previously known as Flood Defence Permit) under The Water Resources Act 1991; works directly affecting flow within the Clitterhouse Stream also require Flood Defence Consent from LBB as the Lead Local Flood Authority (LLFA) under the Flood and Water Management Act. This requirement is separate from the planning process. Consent applications, based on the updated consent process (April 2016) will be submitted to the Environment Agency as part of the detailed design process for the permanent works. This will include drainage outfalls from Phase 1B (North).

12.6 Baseline Conditions

- 12.6.1 The baseline conditions have been reviewed to determine whether there have been any significant changes since the s73 ES and other EIA Documentation was prepared. This review included baseline information available since the s73 ES and other EIA Documentation was prepared. Other baseline information presented in the s73 ES and other EIA Documentation is considered to remain valid unless otherwise stated. The results of the baseline review are presented below.

Surface Water Quality

- 12.6.2 The Hydrogeological Conceptualisation Report, included as Appendix 12.5 to the Phase 1A (North) FIR, presents the surface water quality results for the River Brent.
- 12.6.3 Comparison of water quality from upstream and downstream locations (as reported in the Hydrogeological Conceptualisation Report) showed some increases in contaminants from upstream to downstream of the Site, with four determinands consistently showing an increase in concentration, and with some of these concentrations recorded above the corresponding Environmental Quality Standards (EQS) guideline values. These were boron, manganese, ammonium (as NH₄), phosphorus and *E.Coli*.
- 12.6.4 Updated water quality monitoring results from the most recent monitoring period (April 2015 to January 2016) are now available. These are provided in full in **Appendix 12.3**. The surface water monitoring results are generally in keeping with the previous monitoring results as presented in the Hydrogeological Conceptualisation Report for the River Brent Diversion, as provided in Appendix 12.5 of the Phase 1A (North) FIR. The results show that during the sampling period from April 2015 to January 2016, background surface water quality in the River Brent is generally poor, with indications that contamination occurs upstream of the Scheme, but also some contaminants increase in the river within the Scheme area. Elevated (i.e. above screening levels) TPHs, phenols, dissolved metals and *E.Coli* were recorded during this monitoring period.

Groundwater Quality

- 12.6.5 Updated groundwater monitoring data from April to January 2015, as presented in **Appendix 12.3**, shows elevated levels of hydrocarbons, dissolved metals and phenols in the groundwater across the Site (the borehole locations are generally in the vicinity of the River Brent).
- 12.6.6 Groundwater monitoring was carried out in 2016 as part of site investigations within Phase 1B (North). The monitoring results from October to December 2016 are reported in the Generic Quantitative Risk Assessment (GQRA) (**Appendix 15.2**). Slightly elevated levels of metals and semi-volatile organic compounds (SVOCs) (against acceptable standards) were recorded within the shallow groundwater; further details of which are provided in **Chapter 15** and **Appendix 15.2**. This is consistent with previous monitoring results across the Site as reported in the s73 ES and other EIA Documentation, i.e. generally poor groundwater quality.
- 12.6.7 This contamination has been reported in previous monitoring results, and potential impacts and mitigation measures considered. Therefore, there is no change in the groundwater quality or sensitivity identified within the s73 ES and other EIA Documentation.

12.6.8 Surface water monitoring undertaken in 2015, as previously reported in the Phase 1A (North) FIR, has determined that there is evidence of connectivity between the River Brent and groundwater located in close proximity to the river. Connectivity between groundwater and surface water is likely to occur through weep holes or defects in the concrete liner. Additionally, there is a correlation between surface water and groundwater levels in the area where the realigned river will be located, which appear to be influenced by the pattern of releases from the weir in the Brent Reservoir.

Flooding and Flood Risk

12.6.9 The main sources of flooding to the Site are from the River Brent and the Clitterhouse Stream. Both watercourses were modelled post-realignment and the results presented in the s73 FRA (which formed part of the s73 ES).

12.6.10 Due to the changes in the proposed river re-alignment proposed as part of the Phase 1A (North) RMAs, hydraulic modelling was carried out in May 2015, as reported as part of the Phase 1A (North) FIR. The results confirmed that post re-alignment, the Site could be considered as Flood Zone 1, as all flow can be contained by the proposed channel, up to and including the 1 in 100-year flood, inclusive of climate change.

12.6.11 Further hydraulic modelling has been carried out in 2017 to incorporate the detailed design for Phase 1A (North) and Phase 1B (North) as reported in the FRA Addendum (**Appendix 12.1**). The results of this confirm the findings of the s73 FRA.

12.7 Assessment and Mitigation

Construction

Potential Impacts

12.7.1 Following a review of legislation, policy and guidance, baseline information and the Phase 1B (North) detailed design, it can be confirmed that the potential construction impacts on water resources and flood risk impacts presented in the s73 ES and other EIA Documentation remain valid.

12.7.2 The Indicative Construction Programme (ICP) and the Construction Impact Assessment (CIA), as set out in the s73 Application, have been revised and updated to consider changes to the timing and sequencing of works within Phase 1 (North) (**Appendix 2.1**). Notwithstanding changes to the ICP, construction impacts presented within the s73 ES and other EIA Documentation remain valid for decision making. This is because there is no change to the actual works themselves, and the assessment of water resources and flood risk is not unduly influenced by programming.

12.7.3 The potential impacts during the construction period of the Development are set out below (and detailed in **Table 12.1** at the end of this Chapter).

Surface Water and Groundwater Pollution

- 12.7.4 Pollution and spill risk impacts as identified within the s73 ES and other EIA Documentation, including emergency and unforeseen events, remain valid, as the detailed design for Phase 1B (North) does not present any significant new risks.
- 12.7.5 Risks, as identified within the s73 ES and other EIA Documentation, from general mobilisation of existing contamination on-site due to construction works or dewatering, ground treatment works such as piling, the use of potentially polluting materials, or works in, or in the vicinity of, watercourses, or drainage from areas of construction, have not changed and remain valid.

Flooding

- 12.7.6 The information presented in the FRA Addendum (March 2017) (**Appendix 12.1**) confirms that there are no changes or new significant impacts in terms of flood risk identified as a result of the detailed design of the Phase 1B (North) RMA, nor is there any increase in flood risk during the construction phase.

Water Resource Use

- 12.7.7 The potential impacts upon water resource use as identified within the s73 ES and other EIA Documentation remain valid, as the detailed design for Phase 1B (North) does not present any significant new risks.

Mitigation

- 12.7.8 No other new or different construction mitigation measures beyond those identified in the s73 ES and other EIA Documentation have been identified as a result of the detailed design of Phase 1B (North). These are outlined for reference in **Table 12.1**.

Residual Impacts

- 12.7.9 Having regard to the above, and following application of the DMRB approach, the residual impacts for the construction phase remain as identified in the s73 ES and other EIA Documentation and no new or different residual construction impacts have been identified as a result of the detailed design of the Phase 1B (North) RMA.

Operation

Potential Impacts

- 12.7.10 Following a review of legislation, policy and guidance, baseline information and the Phase 1B (North) detailed design, it is confirmed that the potential operational impacts on water resources and flood risk impacts presented in the s73 ES and other EIA Documentation remain valid. These are set out below (and as detailed in **Table 12.1** at the end of this chapter):

Impacts associated with Additional Flows discharged to Public Sewers

- 12.7.11 Surface water drainage for development plots will be designed as per Planning Condition 44.5 attached to the 2014 Permission:
- “... any Sustainable Urban Drainage System to be submitted for approval in accordance with Condition 1.27 in relation to each Phase or Sub-Phase shall be integral to the site and ensures a commitment to 25% reduction in surface runoff of current 1 in 100-year flow plus 30% for climate change through incorporation of SUDS features, such as Green and Brown Roofs, detention basins, gravelled areas, swales, permeable paving and pipe storage. It must be demonstrated that SuDS have been maximised across the site, with justification provided if targets set in the London Plan cannot be met. The system must treat water pollution in line with Section C of Defra’s National Standards for Sustainable Drainage Systems with regard to specific hazards and receptor....”.*
- 12.7.12 Thames Water undertook a Sewer Impact Assessment for the first phase of Development (which was submitted as part of the Phase 1A (North) FIR), which established that the operational impact of proposed sewer diversions has no detrimental effect upon the level of service required from the foul sewer network, however there would be a detrimental effect on the storm water sewer diversions. This has been overcome by an increase in size of the proposed storm water system requested by Thames Water.
- 12.7.13 Thames Water also undertook a Network Impact Assessment for the whole Site (which was submitted as part of the Phase 1A (North) FIR), to identify the extent of network improvements that are required to enable the existing public foul and surface water sewers to accommodate the foul and surface water discharge from the entire Development. These network improvements are indicative and are subject to refinement during detailed design, however are intended to ensure that existing water quality impacts are not worsened, ensuring the impact on the Development is negligible.
- 12.7.14 The detailed surface water drainage design for the plots within Phase 1B (North) (see **Chapter 2: Description of Phase 1B (North) RMA**) takes into account all relevant legislation and guidance and the 2014 Sustainable Design and Construction SPGⁱⁱ.
- 12.7.15 For Phase 1B (North), the peak rate of surface water discharge to the River Brent and existing surface water drainage network will be reduced by 25% for rainfall events with a return period of up to and including 1 in 100 years, including an allowance of 30% for climate change. This approach will comply with the requirements of the Drainage Strategies that accompanied the Outline Planning Application in 2008 and the Supplementary Drainage Strategies that supported the s73 Application in 2013, in addition to Condition 44.5, as outlined above.
- 12.7.16 This will be achieved by means of attenuation and SUDS, including blue roofs, green roofs, filter drains, permeable paving and, within Sturgess Park, underground gravel storage trenches and swales.
- 12.7.17 The proposed drainage strategy for the new Town Centre is provided as an appendix within the FRA Addendum for Phase 1B (North) (**Appendix 12.1**). Surface water from the new build will be collected via rainwater harvesting tanks, blue roofs and / or attenuation tanks. Discharge will be restricted to the allowable discharge rate by means of hydrobrake devices. The Drainage Strategy (**Appendix 12.1**) provides more details in relation to these measures.

12.7.18 A new foul drainage system will be provided for the new build within Phase 1B (North), as outlined in the s73 ES and other EIA Documentation, which remains valid.

Modifications to Existing Abstractions and Discharges

12.7.19 Although not part of the Phase 1B (North) RMA, the existing Brent Cross Shopping Centre (BXSC) is intrinsically linked to the proposed extended shopping centre and therefore the drainage proposals as a whole for the existing BXSC and the New Town Centre have been considered.

12.7.20 For surface water drainage, new connections are proposed to connect the existing BXSC to the Thames Water sewers, which will be diverted (under a Section 185 Agreement) as part of the wider infrastructure works.

12.7.21 The detailed design for Phase 1B (North) is keeping with the agreed discharge rates, as outlined in Condition 44.5, attached to the 2014 Permission.

12.7.22 The existing foul water sewers within the Phase 1B (North) development area will be maintained and reused for the most part. Some of the existing drainage will need to be diverted to facilitate construction of the new buildings, with new connections made to the wider sewerage infrastructure, some of which is to be diverted as part of the wider infrastructure works.

Surface Water and Groundwater Pollution

12.7.23 The potential pollution risks to surface water and groundwater, including soils and leaks from the bus station, car parks and roads, culverts and bridge maintenance and surface water pollution from surface water and foul water drainage, remain unchanged by the detailed design for Phase 1B (North).

12.7.24 Potential contaminants from Phase 1B (North) will be from car parking (specifically any car parking not covered) and the bus station area. Measures to prevent water quality impacts included in the detailed design proposals include diffuser units, to provide treatment by removing oils and contaminants prior to discharge, and slot drains with sumps to remove debris. A full retention petrol interceptor (In accordance with Condition 38.5 of the 2014 Permission) and a by-pass separator will be provided within the bus station area.

Flooding

12.7.25 Overall the s73 FRA concluded that with the new channel in place, there was no significant flood risk impact upon the surrounding areas upstream or downstream. The results confirmed that post re-alignment, the Site could be considered as Flood Zone 1, as all flow can be contained by the proposed channel, up to and including the 1 in 100 year flood event, inclusive of climate change. The detailed design of Phase 1B (North) has no material impact on the potential for localised flooding. The structural engineers for the project have taken into account the risk of potential groundwater flooding and have incorporated basement groundwater proofing measures into the detailed design for the relevant buildings. This is therefore considered to be inherent mitigation.

12.7.26 The FRA Addendum (**Appendix 12.1**) confirms the findings of the s73 FRA. The updated modelling showed that, although in a number of locations there are slight differences in the maximum height of water levels, these changes are still within model tolerances and therefore there is no change in the conclusions of the flood risk identified within the s73 ES and other EIA

Documentation, i.e. that the maximum water levels will stay within the river channel during a 20% AEP event (i.e. the 1 in 5 year event). It should be noted that further modelling is ongoing, however the results are not yet available.

Water Resource Use

12.7.27 The impacts on water resource use remain unchanged by the Phase 1B (North) RMA details and no further relevant information is available. The connections and demand associated with the operation of Plots 101 to 113 do not alter the findings of the s73 ES and other EIA Documentation.

Water Framework Directive Assessment

12.7.28 A WFD Assessment was included as part of the s73 ES, within the s73 FRA, with the objectives for 2015 reported. The WFD Assessment has been updated (March 2017) to take account of the detailed design for Phase 1A (North) and Phase 1B (North) and is included as **Appendix 12.2**.

12.7.29 The River Brent is classified as the Dollis Brook and Upper Brent waterbody within the Brent Rivers and Lakes operational catchment of the Thames River Basin Management Planⁱⁱⁱ. The updated WFD Assessment shows the waterbody to be at 'moderate' potential with the objective for 2027 to reach 'Good Ecological Potential'. The findings of the updated WFD Assessment remain the same as those presented in the s73 ES and other EIA Documentation.

Summary

12.7.30 Overall, following a review of legislation, policy and guidance, baseline and the Phase 1B (North) detailed design, it is confirmed that the assessment of potential operational impacts presented in the s73 ES and other EIA Documentation remains valid. There have also been no significant changes to legislation, policy and guidance since the s73 ES and other EIA Documentation was prepared; and the results of the further assessment of water resources and flood risk undertaken in relation to the Phase 1B (North) detailed design (having regard to the assessment previously undertaken for Phase 1A (North) and presented in the Phase 1A (North) FIR accord with the assumptions of the assessment undertaken at outline stage and presented in the s73 ES and other EIA Documentation.

Mitigation

12.7.31 The SuDS, attenuation and pollution control measures identified in the Potential Impacts section of this Chapter are included in the detailed design of Phase 1B (North) and are therefore considered to be inherent mitigation measures.

12.7.32 Ongoing maintenance of these measures will be required, as set out in the drainage strategy for Phase 1B (North) (**Appendix 12.1**).

12.7.33 Other than the provision of details of the inherent design measures outlined in this Chapter, no new or different mitigation measures beyond those identified in the s73 ES and other EIA Documentation have been identified as a result of the detailed design development for the operational Development. These mitigation measures are detailed in **Table 12.1**.

Residual Impacts

- 12.7.34 The residual impacts remain as identified in the s73 ES and other EIA Documentation and no new or different residual impacts have been identified as a result of the detailed design of the Phase 1B (North) RMA or changes in baseline conditions.
- 12.7.35 A summary of the residual impacts associated with water and flood risk is included within **Chapter 22: Summary of Residuals Impacts and Mitigation**.
- 12.7.36 The residual impacts are detailed in **Table 12.1**.

Table 12.1: Summary of Significance of Effects on Water Resources and Flood Risk

Potential Impact	Feature	Attribute	Quality	Importance	Magnitude	Effects pre-mitigation	Mitigation	Residual Impact (Change from s.73 ES and other EIA Documentation)
Construction Phase								
Surface and Groundwater Pollution – spills and leaks and general risks of pollutant introduction due to construction works, mobilisation of existing contamination on site, ground treatment works, works in, or in the vicinity of, watercourses and construction site drainage.	River Brent / Clitterhouse Stream / Welsh Harp Reservoir / Groundwater	Water Quality	Chemical Water Quality	High	Negligible to Moderate Adverse (Temporary)	Negligible to Moderate Adverse	<p>Monitoring, review of emerging data and development or alteration of site practices, design and mitigation as required</p> <p>SuDS and drainage measures with water quality controls</p> <p>Handling and disposal methods of existing contamination to be agreed with Environment Agency and other relevant parties.</p> <p>Abstractions / discharges only with appropriate consent / no direct discharges will be made</p> <p>Potential pollutants will be stored appropriately and dust measures employed.</p> <p>Waste will be managed and stringent site practices employed, including maintenance programmes.</p> <p>Specific programmes will be developed for invasive plant species eradication</p> <p>Works will be conducted by experienced contractors in accordance with method statements</p>	Negligible to Minor Adverse (No changes from s.73)

Potential Impact	Feature	Attribute	Quality	Importance	Magnitude	Effects pre-mitigation	Mitigation	Residual Impact (Change from s.73 ES and other EIA Documentation)
Soil Compaction	River Brent / Clitterhouse Stream / Groundwater	Increase in runoff	Water Quality and Flow	High	Low (Temporary)	Minor Adverse	Controls to movement and establishment of defined tracks. Measures will be included within CoCP	Negligible to Minor Adverse (No changes from s.73)
Flood Risk – Localised flooding (ponding) on site	River Brent / Clitterhouse Stream	Flood Risk		High	Low to Medium (Temporary)	Minor Adverse	Stockpiles to be minimised and covered where necessary Plant, materials and chemicals will not be stored within or near watercourses, or in areas at risk of on-site flooding	Negligible Risk of secondary adverse impacts minimised (No changes from s.73)
Water Resource Use	River Brent / Clitterhouse Stream	Water Quality and Flow	Chemical Water Quality	High	Low (Temporary)	Minor Adverse	Water use in life cycle of construction materials will be investigated Education programmes will be initiated to encourage workers to use water efficiently All abstractions, discharges and impoundments will be conducted only with appropriate consent	Minor Adverse (Temporary) (No changes from s.73)
Operational Phase								
Surface and Groundwater Pollution	River Brent	Water Quality	Chemical Water Quality	High	Medium	Minor to Moderate Adverse	Full retention interceptors / Penstock valves retrofitted into the s.w. drainage network	Negligible to Minor Adverse (No change)

Potential Impact	Feature	Attribute	Quality	Importance	Magnitude	Effects pre-mitigation	Mitigation	Residual Impact (Change from s.73 ES and other EIA Documentation)
							<p>Appropriate attenuation and pollution prevention measures (including SuDS) to be installed to remove contaminants.</p> <p>Specific pollution prevention measures and monitoring programmes will be developed for high-risk operational areas.</p>	
Flood Risk	River Brent / Clitterhouse Stream	Flood Risk		High	Medium (Beneficial)	Moderate Beneficial	<p>Land raising will be completed with suitable contouring and profiling to allow any floodwaters to be channelled back into the river or into the surface drainage network</p> <p>SUDS will reduce peak discharge from proposed development by at least 25%</p>	Moderate (Beneficial) (No changes from s.73)
Flood Risk – Groundwater flooding to basements or low floor levels	Groundwater	Flood Risk		High	Medium	Moderate Adverse	Waterproofing of basements or low floor levels alongside the northern bank of the River Brent.	Minor Adverse
Culvert and bridge maintenance	River Brent / Clitterhouse Stream	Water Quality	Chemical Water Quality	High	Medium	Moderate	Specific measures and method statements will be developed and applied	Negligible to Minor Adverse (No changes from s.73)
Operational site drainage and water resource use	Drainage Network, River Brent / Clitterhouse Stream	Water Quality and Flow	Chemical Water Quality	High	Low (Temporary)	Minor Adverse (Temporary)	Appropriate attenuation and pollution prevention measures (including SuDS) to be installed to reduce peak discharge and remove contaminants	Potential minor to moderate positive impacts to water quality and flooding

Potential Impact	Feature	Attribute	Quality	Importance	Magnitude	Effects pre-mitigation	Mitigation	Residual Impact (Change from s.73 ES and other EIA Documentation)
							<p>All abstractions, discharges and impoundments will be conducted only with appropriate consent</p> <p>Connection to the existing drainage network will only be made following assessment of their condition and application of suitable controls and mitigation</p> <p>Specific pollution prevention measures and monitoring programmes will be developed for high-risk operational areas</p> <p>Monitoring results will be regularly reviewed and appropriate action taken where required</p>	(No changes from s.73)

References

ⁱ HMSO, (1991); 'The Water Resources Act'

ⁱⁱ Greater London Authority, (2014); 'Supplementary Planning Guidance – Sustainable Design and Construction'

ⁱⁱⁱ Department for Environment, Food & Rural Affairs and Environment Agency; Thames River Basin Management Plan, 2009.