CHAPTER 19 – SUMMARY OF RESIDUAL EFFECTS

19.1 Introduction

19.1.1 This chapter summarises the residual environmental effects of the Upgrade.

19.1.2 Residual effects are those that remain following the incorporation of any identified mitigation measures. While the Upgrade design and construction methods have been developed to avoid environmental impacts, incorporating mitigation by design, some additional mitigation measures have been identified through the EIA process.

19.1.3 The significance of residual construction and operation effects set out below has been presented in accordance with the methodology utilised by each technical assessment. Negligible effects are not considered significant.

19.2 Summary of Residual Effects

Site Enabling, Demolition and Construction

19.2.1 **Table 19.1** provides a summary of the significant residual effects of the construction of the Upgrade, comprising enabling works, demolition and the five phases of construction.

Table 19.1: Summary of Residual Construction Effects

Likely Residual Effect	Significance
AIR QUALITY	
Effects of construction dust and traffic emissions	Negligible
CONTAMINATED LAND	
Potential effects of soil contamination	Minor / Moderate Beneficial
Potential effects of ground gases	Negligible
Effects of contaminants on groundwater during piling operations	Negligible
ECOLOGY	
Direct damage / deterioration of Lea Valley Site of Metropolitan Importance for Nature Conservation as a result of incursion, noise, air quality / dust deposition	Negligible
Indirect deterioration of Chingford Reservoirs Site of Special Scientific Interest due to noise and dust	Negligible
Effects on Salmons Brook and Montague Road Recreation Ground Site of Borough Importance for Nature Conservation due to changes in water quality, hydrology and geomorphology	Negligible
Direct damage / deterioration of species poor hedgerows as a result of incursion	Negligible
Loss of 180m of species poor hedgerow and replacement with 800m of species rich hedgerow	Minor Beneficial

Likely Residual Effect	Significance
Provision of brown roofs	Minor Beneficial
Deposition of dust on species poor hedgerow	Negligible
Loss to breeding and wintering birds of 0.35 hectares of plantation woodland and scrub and replacement with new planting and bird boxes	Minor Beneficial
Loss of 0.35 hectares of foraging habitat for bats and replacement with new planting	Negligible
Loss of bat roosting opportunities as a result of removal of trees and refurbishment of the training building as an education centre, with provision of bat boxes	Negligible
Habitat deterioration for breeding and wintering birds, bats and common reptiles as a result of dust deposition	Negligible
Habitat deterioration as a result of changes to water quality	Negligible
Mortality / injury to bats and breeding / wintering birds as a result of habitat clearance	Negligible
Noise effects on breeding and wintering birds	Minor Adverse (temporary)
Dispersal of non-native invasive species	Negligible
FLOOD RISK	
Changes to local topography leading to changes in flood risk	Minor Adverse (temporary)
Changes to site permeability leading to changes in surface water flood risk	Negligible
Blockages of drainage systems resulting in surface water flood risk	Negligible
Encountering and damaging mains resulting in flooding	Negligible
Personnel being at risk of increase flood risk due to construction work placing them in higher risk areas (e.g. below ground)	Negligible
Increased risk of flooding due to an increase in the number of surface watercourses on site (associated with dewatering and subsequent a settlement treatment train)	Minor Adverse (temporary)
Increased number of people at risk of reservoir flooding with number of people on site being increased	Minor Adverse (temporary)
HEALTH AND WELL-BEING	
Effect on Air Quality, Noise and Neighbourhood Amenity	Negligible
Effect on Social Cohesion and Lifetime Neighbourhoods	Negligible
Effect on Accessibility and Active Travel	Negligible

Likely Residual Effect	Significance
Effects on Access to Work and Training	Beneficial
Effects on Minimising the use of Resources	Beneficial
Effects on Climate Change	Beneficial
HISTORIC ENVIRONMENT	
Damage or loss to archaeological deposits, palaeo – environmental deposits and Glacial Arctic Bed) deposits	Moderate/Minor Adverse
LANDSCAPE AND VISUAL	
Indirect effects due to loss of trees on the Site, Lee Valley Natural Signature and Large scale industry Landscape Character Typology (first year of construction)	Moderate/Minor Adverse (short term)
Effects on views of the Site from residents of Picketts Lock Lane, recreational users of the Lee Valley Athletics Centre and Golf Course and, recreational users of Lee Park Way, cyclists on National Cycle Route 1 and Pymmes Brook Trail	Moderate/Minor Adverse (short term)
NOISE AND VIBRATION	
Construction noise effects on Picketts Lock Cottage	Moderate Adverse (temporary)
Construction noise effects on Picketts Lock Lane and Lee Valley Golf Course	Minor Adverse/Negligible (temporary)
Construction vibration effects	Negligible
Construction traffic noise effects	Negligible
ODOUR	
Effect of decommissioning existing plant / commissioning new plant	Negligible
TRANSPORT	
Effect of construction traffic	Negligible
WASTE	
Effect of construction waste management	Negligible
WATER RESOURCES	
Effect of demolition and construction activities leading to contaminant transfer from on-site activities	Negligible
Effect of demolition and construction activities leading to contaminant transfer via localised flooding	Negligible
Demolition and construction activities leading to pollution of downstream watercourses	Negligible

Likely Residual Effect	Significance
Demolition and construction activities leading to temporary effects on treated effluent quality	Negligible

Operation

19.2.2 **Table 19.2** provides a summary of the significant residual impacts arising once the Upgrade is operational.

Table 19.2: Summary of Residual Operational Impacts

Likely Residual Effect	Significance
AIR QUALITY	
Effects of emissions from new combined heat and power engines on human health and on designated wildlife sites	Negligible / Major Beneficial
CONTAMINATED LAND	
Potential effects of soil contamination	Negligible
ECOLOGY	
Water quality changes to Salmons Brook and Montague Road Recreational Ground Site of Borough Importance for Nature Conservation	Minor Beneficial
Indirect effects on Salmons Brook and Montague Road Recreational Ground Site of Borough Importance for Nature Conservation due to air quality changes from new combined heat and power engines	Minor Beneficial
Indirect deterioration of Chingford Reservoirs SSSI and Lea Valley Site of Metropolitan Importance for Nature Conservation due to air quality changes from Combined Heat and Power engines	Negligible
Effect on Walthamstow Marshes SSSI due to changes in water quality	Negligible
Dispersal of non-native invasive species	Negligible
Risk of changes to invertebrate populations as a result of insect infestation	Negligible
Water quality impacts on downstream diatom, macrophyte, macro invertebrate and fish community compositions	Minor Beneficial
FLOOD RISK	
Change in flood risk associated with how surface water at the site is managed	Major Beneficial
Changes to fluvial flood risk as a result of the Upgrade	Negligible
Change to groundwater flood risk as a result of the Upgrade	Minor Beneficial
Increased number of people on site (with education centre and trail) at risk of reservoir flooding	Minor Adverse
Blockages of drainage systems resulting in surface water flood risk	Negligible

Likely Residual Effect	Significance
HEALTH AND WELL-BEING	
Effects on Air Quality, Noise and Neighbourhood Amenity	Beneficial
Effects on Accessibility and Active Travel	Negligible/Beneficial
Effects on Access to Work and Training	Beneficial
Effects on Social Cohesion and Lifetime Neighbourhoods	Beneficial
Effects on Minimising the use of Resources	Beneficial
Effects on Climate Change	Beneficial
HISTORIC ENVIRONMENT	
Effects on the historic environment	Negligible
LANDSCAPE AND VISUAL	
Visual effects on residents of Picketts Lock Lane, Cyclists on National Cycle Route 1 and users of Lee Park Way (first year of operation)	Negligible / Minor Adverse (temporary)
Visual effects residents of Picketts Lock Lane, Cyclists on National Cycle Route 1 and users of Lee Park Way (10 years after operation)	Minor Beneficial
Effects on the landscape character of the Site through loss of trees and vegetation (first year of operation)	Minor Adverse (temporary)
Effects on the landscape character of the Site (10 years after operation)	Minor Beneficial
Effects on the perceptual character of the Large Scale Industry Character Area through loss of boundary vegetation and bund (first year of operation)	Minor Adverse (temporary)
Effects on the perceptual character of the Large Scale Industry Character Area (10 years after operation)	Negligible / Minor Beneficial
NOISE AND VIBRATION	
Effect of operational noise from new plant and equipment (no increase to existing operational noise levels)	Negligible / Minor Adverse
Effect of vibration	Negligible
ODOUR	
Effect of odour emissions from the Upgraded works	Major Beneficial (permanent)
WASTE	
Effects of waste management during operation	Negligible

Likely Residual Effect	Significance
WATER RESOURCES	
Effect of changes to water quality and flow regimes from improvements to sewage treatment to meet new environmental permit	Minor Beneficial (permanent)
Changes to water quality and flow regimes as a result of the new drainage system	Negligible

19.3 Summary of Cumulative Effects

Intra-project Effects

19.3.1 Chapters 7 – 18 of this ES consider the likely topic specific environmental effects of the Upgrade and, to ensure that any potential environmental effects are not overlooked, also consider the potential for intra-project effects. The identified intra – project effects are:

- **Chapter 7 - Air Quality: –** considers the cumulative effect of road traffic with Combined Heat and Power emissions on sensitive air quality receptors.
- **Chapter 11 - Health and Well-Being: -** considers the cumulative effect of construction air quality, odour, landscape and visual, noise, and transport impacts on Health, Well-being and Neighbourhood Amenity for sensitive receptors.
- **Chapter 14 - Noise and Vibration: -** considers the cumulative effect of traffic and noise on sensitive receptors.

19.3.2 The above intra-project cumulative effects occur during the construction phase only and as such are temporary, reversible and are not considered to be significant.

19.3.3 During the operational phase, there will be minor adverse noise and temporary landscape impacts affecting receptors around the Site. These impacts are unlikely to result in significant adverse cumulative effects.

19.3.4 No significant intra-project effects are therefore predicted to occur as a result of the Upgrade.

Inter-project Effects

19.3.5 No developments identified and assessed as part of the inter-project cumulative assessment are considered likely to cause any significant cumulative effects with the Upgrade. The Historic Environment assessment notes that several developments, along with the Deephams Sewage Works Upgrade, lie within the Lea Valley Archaeological Priority Area. However, it is likely that following appropriate programmes of archaeological investigation these impacts would not be considered to be significant.

19.3.6 No significant cumulative effects are likely to arise across any topics as a result of any potential overlap between the AMP5 projects and the Upgrade.

19.3.7 No significant cumulative odour effects are likely to arise as a result of the Upgrade and potential future thermal hydrolysis plant (THP) project.

19.3.8 No significant inter-project effects are therefore predicted to occur as a result of the Upgrade.

19.4 Conclusions

Construction Effects

19.4.1 The construction of the Deephams Sewage Works Upgrade will result in a residual beneficial effect of moderate significance on contaminated land. Due to the removal of contamination during construction, this effect will be direct, permanent and non-reversible.

19.4.2 A residual adverse effect of moderate significance is likely to occur on the historic environment as a result of a direct, permanent, and non-reversible removal of archaeological remains within the site.

19.4.3 Construction will result in a short term, reversible adverse effect of locally moderate significance on the landscape and views in and around Deephams Sewage Works, but this will reduce to minor adverse after 10 years when replanting associated with the Landscape Strategy has matured.

19.4.4 There is a residual adverse effect of moderate significance on the noise sensitive receptor at Picketts Lock Cottage but this will be a direct, temporary, reversible effect during construction only.

Operational Effects

19.4.5 During operation, the Upgrade will result in a number of residual beneficial effects of major significance that will be permanent and non-reversible.

19.4.6 The operation of the Upgrade will bring about beneficial, permanent, non-reversible effects of major significance on odour emissions from the sewage works, as a result of the installation of covers and odour control to the most odorous parts of the sewage works. This will have indirect, permanent, beneficial effects on the health and well-being of local residents, through improving local amenity and conditions for outdoor exercise and recreation.

19.4.7 Permanent, non-reversible beneficial air quality effects on the Salmons Brook and Montague Road Recreation Ground Site of Borough Importance will be achieved through the installation of new more efficient Combined Heat and Power engines. Permanent beneficial and non-reversible effects on flood risk will also be achieved through modifications to the site drainage system. Both of these effects are of major significance.

19.4.8 The operational Upgrade will also provide permanent, non reversible beneficial effect of minor significance through improving water quality in the receiving watercourses, as a result of the upgraded sewage works meeting the standards required by the new environmental permit. This will help to improve the ecology of the receiving watercourses, although this is also affected by factors other the quality of effluent from Deephams Sewage Works.