

4. Need

4.1 Introduction

4.1.1 The need for the Upgrade of Deephams STW is driven by the requirements of European Directives, subsequently reflected in the details of a new environmental permit set for Deephams Sewage Works by the Environment Agency through the National Environment Programme (NEP). The strategic need for the project was confirmed by the inclusion of the Deephams Sewage Works Upgrade as a named project within the National Policy Statement (NPS) for Waste Water (2012). In meeting the European Directive requirements, the Upgrade also provides the opportunity to provide sewage treatment for North London that is 'fit for purpose', supports population growth and regeneration proposals in the catchment and is sustainable in the long-term.

4.1.2 This Chapter sets out the need for the proposed development through the following:

- 4.2 Summarising the existing sewage treatment arrangements at Deephams Sewage Works and identifying their constraints;
- 4.3 Identifying the legal and regulatory context in which operation of the Deephams Sewage Works sits;
- 4.4 Existing and future environmental permit standards that it must meet;
- 4.5 Strategic need as confirmed by the NPS for Waste Water and the National Environment Programme;
- 4.6 Considering the benefits that will arise from the Upgrade scheme to meet future standards;
- 4.7 Considering the implications of failing to meet the need for the proposed development.

4.2 Existing Deephams Sewage Works and its Constraints

4.2.1 Deephams Sewage Works serves a Population Equivalent (PE) of 891,000 (as of 2011). This is a calculation of the capacity of the sewage works that takes account of both domestic sewage and industrial/commercial wastewater discharges. The Deephams Sewage Works that exists today is predominately the works that was first constructed in the 1950s and 1960s, with ageing plant under increasing pressure to meet and maintain increasingly more stringent treatment standards.

4.2.2 As with much of the sewer network in London, and in many older towns and cities in the United Kingdom, the sewers in the Deephams catchment were originally watercourses. Until the mid 1800's it was common practice for households to dispose of their waste into the nearest ditch or stream. Increasing populations led to this practice giving rise to odour and disease related nuisance until the sanitary authorities at the time took the decision to enclose these water courses by bricking them over, thereby creating sewers.

4.2.3 During rainfall, these sewers continued to drain the storm flows, thus performing a land drainage function, and, as new roads were constructed, they too were drained to these early sewers. This combined function of serving domestic waste and detritus generated during storm flows and from new roads established the early principle of combined sewers. Many of the oldest sewers in the Deephams

catchment are essentially combined sewers dating from the 1850's and are still in use today.

- 4.2.4 Rapid urban and population growth during the 1870's led to the rivers that received the discharges from these sewers becoming polluted, giving rise to the need for the establishment of sewage treatment farms. These early treatment works comprised settlement followed by discharge over land. As growth continued, insufficient land was available to extend the existing sewage farms so the first treatment works were constructed, including the Deephams Sewage Works Site.
- 4.2.5 From the 1900's, to manage risings costs, it became standard practice to provide separate sewers for the drainage of surface water and for foul sewage. This was particularly relevant in the Deephams catchment as it was during this period that the major growth in the catchment occurred. New housing estates were built each served by new roads and new separate drainage.
- 4.2.6 However, over time, it has proved difficult to control connections to pre-existing separate sewers and prevent further connections of surface water to the foul sewers and, on occasions, foul sewage to surface water sewers. Overall, for Deephams, the degree of surface water connections to foul is small however, it still results in a significant increase in flows during storms.
- 4.2.7 Sewage treatment processes take sewage and other wastewater discharges from residential, industrial and commercial properties and treat them to enable waste products of a high enough quality to be discharged to the environment. The two principal products of sewage treatment are effluent and sewage sludge.
- 4.2.8 As explained in Chapter 2, Deephams Sewage Works currently provides preliminary, primary, secondary and tertiary treatment of wastewater, together with on site anaerobic digestion of sewage sludge. The final effluent discharges to Salmons Brook, a minor tributary of the River Lee which itself flows into the River Thames in East London. In low flow conditions in Salmons Brook, the proportion of the flow which is effluent is high.
- 4.2.9 During storms, the design capacity of the sewage works can be exceeded leading to what it is termed 'storm flows'. At Deephams, these storm flows are diverted to 10 storm tanks. Where the flows exceed the maximum capacity of the storm storage tanks, those excess volumes can normally be discharged untreated (but screened) via a culvert to Salmons Brook. Whilst these flows do contain untreated sewage, they are significantly diluted by the high volumes of rainwater that are drained to the sewage works in storm events. The discharge of these storm flows to Salmons Brook are regulated by the Environment Agency under the terms of the environmental permit for the Deephams Sewage Works.
- 4.2.10 Notwithstanding successive upgrades to meet ever more stringent discharge standards and to treat greater quantities of sewage generated by growth within the catchment, a significant proportion of the infrastructure at Deephams Sewage Works, is coming to the end of its life.
- 4.2.11 As a result, maintaining the necessary high environmental standards of sewage treatment and effluent discharge is becoming more challenging to achieve with the infrastructure at Deephams Sewage Works. This is particularly the case for primary and secondary treatment streams 'A' and 'B', which date back to the 1950s.

4.2.12 The combination of age and condition of the assets means that it is difficult for Thames Water to effectively and efficiently treat the sewage arising within the Deephams catchment both now and in terms of meeting future needs.

4.3 Legal and Regulatory Context

4.3.1 Thames Water is the statutory sewerage undertaker for the London Area, including the Deephams catchment. As such it has a statutory duty under the Water Industry Act 1991 to provide, improve and extend a system of public sewers and effectively deal with the contents of those sewers. The duty is enforceable by the Secretary of State and the industry's financial regulator, Ofwat.

4.3.2 In addition to this broad requirement, individual discharges of effluent from sewage works (both continuous and intermittent) are regulated by the Environment Agency, which is the statutory body responsible for determining, issuing and monitoring environmental permits. These permits set limits on the polluting load discharged, and are the detailed means by which UK Regulations and European Directives are implemented.

4.3.3 Economic regulation of the water companies is carried out by the Water Services Regulation Authority (Ofwat). Ofwat's main duties are to:

- Protect the interests of consumers, wherever appropriate by promoting effective competition, and
- Ensure that the functions of each undertaker are properly carried out and that they are able to finance their functions, in particular by securing a reasonable rate of return on their capital.

4.3.4 Ofwat sets annual price limits for each company and reviews water company prices to customers in five yearly price reviews. Water companies divide their spending programmes into five-year Asset Management Plans (AMP) aligned to Ofwat's price review cycle. The funding cycle limits the water companies' ability to expend resources on capital projects not identified in the AMP. Ofwat ensures that companies' charges comply with their price limits and that charges to different customer groups are broadly cost effective and represent value for money.

4.3.5 Ofwat also requires each company to plan forward and establish 25 year investment strategies and to put each AMP plan within this context. The 25 year plans take into account, among other considerations, changes in legislation, household consumption, population, river water quality and environmental enhancements. Thames Water's 25 year Strategic Direction Statement, 'Our long-term strategy 2015 to 2040' was published in 2013. This sets out the Company's water supply and wastewater infrastructure priorities for the future. Thames Water also submitted its Draft Business Plan for the 2015-2020 period to Ofwat in December 2013. Ofwat are due to issue a Final Determination in December 2014.

4.4 Future Environmental Permit Requirements

4.4.1 Deephams Sewage Works, like all sewage works, must perform to standards set in environmental permits that are issued against the operation of the works. These control the chemical and biological standards present in the final effluent that is to

be discharged and influence the way in which wastewater is treated within the sewage works.

- 4.4.2 The 31st March 2010 environmental permit for Deephams Sewage Works applied a reduction in permitted ammonia levels. Since 31st March 2011, the Environment Agency has required further discharge improvements in accordance with the Water Framework Directive, both in terms of the environmental standards, and particular measures to mitigate the impacts of overflows from the sewage works' storm tanks. By March 2012, the permit was further tightened to include, for the first time, a limit on phosphorus.
- 4.4.3 Dosing downstream of the storm tank discharge with an oxidising agent was introduced in 2011 to meet the commitment to improve water quality in Salmons Brook and River Lee.
- 4.4.4 To achieve the March 2012 phosphorus standard, chemical dosing has been introduced, along provision of a ferric chemical dosing plant and a tertiary treatment plant, and other associated works. The dosing will cause the phosphorus to precipitate allowing it to be removed by settlement along with the sewage sludge.

Table 4.1 Environmental Permit Changes at Deephams Sewage Works

Date	Consent Changes	Consent ¹ (SS:BOD:NH ₃ :P)
31 st March 2010		30/10/3/-
31 March 2011	Peroxide dosing required to mitigate downstream problems caused by storm discharge and achieve compliance with the Water Framework Directive BOD and DO requirements	30/10/3/-
31 March 2012	New phosphorus standard imposed to reduce eutrophication in 27km of Lee Navigation. Also consent limit of 2.5mg/l total Iron and 1mg/l total Aluminium	30/10/3/1mg/l
31 March 2017 ²	Step change in standards imposed to achieve compliance with the Freshwater Fish Directive.	10/5/1/1mg/l

Notes: 1. SS – suspended solids; BOD – Biochemical Oxygen Demand; NH₃ – Ammonia; P – Phosphorus / 2. Date for chemical consents is 31 March 2017. Date for flow related consents is 1 March 2017.

- 4.4.5 In March 2017 the new environmental permit issued by the Environment Agency takes effect which requires a step change in the standard of effluent discharged from the Deephams Sewage Works. This includes one of the lowest ammonia standards in the country.
- 4.4.6 The new environmental permit has been set so that Deephams Sewage Works contributes to water quality improvements in the Salmons Brook, River Lee and Lee Navigation, which do not currently meet European and UK water quality standards. The three key European Directives driving the change to the environmental permit - the Water Framework Directive (WFD), the Urban Wastewater Treatment Directive and the Freshwater Fish Directive - are therefore described in more detail in the following sections.

- 4.4.7 The new tighter permit requirements, set out in Table 4.1, cannot be met with the sewage works in its current operational format. Further enhanced treatment at the beginning of the sewage treatment process is required to produce the quality of effluent that will comply with the permit. Equally, new storm tanks are needed to conform to the storm capacity elements of the permit and address the current storm overflows from Deephams Sewage Works. The additional capacity of the storm tanks is designed to improve the operation of the sewage works during storm events.

European Union Directives

Water Framework Directive

- 4.4.8 The WFD aims to protect and enhance the quality of the surface waters and groundwaters throughout Europe. Member states must aim to achieve good ecological and chemical status in inland and coastal waters. Three water bodies in the vicinity of Deephams, Salmon's Brook, Pymmes Brook and River Lee (from Tottenham Locks to the Tideway), currently fail to meet the water quality requirements of the WFD.
- 4.4.9 The current Thames River Basin Management Plan classifies Salmon's Brook and River Lee (Tottenham Locks to Tideway) water bodies as having poor status for dissolved oxygen. The River Lee (Tottenham Locks to Tideway) water body was also classified as moderate status for ammonia, and although both Salmon's Brook and Pymmes Brook as a whole achieved high status for ammonia, sample points downstream of Deephams Sewage Works have failed.

Urban Wastewater Treatment Directive

- 4.4.10 In July 1998 the River Lee and Lee Navigation were designated as a sensitive area (eutrophic) under the provisions of the Urban Waste Water Treatment Directive 1991.
- 4.4.11 Eutrophic conditions cause excessive growth of algae and other plants that can affect aquatic biodiversity and overall water quality.
- 4.4.12 Whilst improvements have already been made further up the River Lee catchment that have reduced nutrient inputs, the River Lee and Lee Navigation remain eutrophic. The River Basin Management Plan identifies the London catchment as highly urbanised with its associated increased surface water run-off, as a significant contributory factor to the water quality issues. Discharges of effluent, storm flows and misconnections in the sewer network are other problems that have led to poor water quality. The Environment Agency therefore considers that there remains a need to reduce nutrient inputs from Deephams Sewage Works to the lower stretches of the River Lee.
- 4.4.13 In 2012, in response to a previous change in the current environmental permit, chemical dosing was installed in two places within the sewage works to remove phosphorus – in the primary settlement tanks and simultaneous dosing into the activated sludge aeration lanes. Further tertiary treatment using disc filters to control solids-related effluent phosphorus, iron and aluminium concentrations also assists in reducing nutrients in the final effluent. However, these measures are not

considered to provide a long term solution because dosing increases the production of sewage sludge and has associated increases in operational cost.

Freshwater Fish Directive

- 4.4.14 The Fresh Water Fish Directive (2006/44/EC) was repealed by the Water Framework Directive (2000/60/EC) on 22 December 2013.
- 4.4.15 Nevertheless, in 2003, the stretch of the River Lee downstream of Deephams Sewage Works was designated as a cyprinid water (waters which support or become capable of supporting fish belonging to the cyprinids or other species such as pike, perch and eel) in accordance with the provisions of the Freshwater Fish Directive (2006).
- 4.4.16 The Directive set physical and chemical water quality objectives for these types of waters, particularly in relation to ammonia to which fish are typically sensitive. These objectives are now incorporated within the WFD standards. The new environmental permit standard is designed to provide improvements to the River Lee and Lee Navigation downstream of Deephams Sewage Works in Tottenham and Walthamstow.
- 4.4.17 There are no measures that could be introduced to the existing sewage works that would reduce the ammonia levels in the discharged effluent without the Upgrade in place.

Environmental Permit Conditions

- 4.4.18 The requirements of these European Directives have therefore been reflected in the details of the new Environmental Permit. The new permit conditions were published by the Environment Agency in March 2010 and are set out in Table 4.2.

Table 4.2 Deephams Sewage Works Effluent Quality Standards from March 2017

		Concentration (mg/l)			
		TSS	BOD	NH ₃ -N	P
Effluent	95 percentile	10	5	1	1 (average)
	Upper tier	--	50	12 Summer 20 Winter	-
	Maximum Admissible Concentration	Total iron – 2500 microgrammes per litre Total aluminium – 1000 microgrammes per litre			
	Dry Weather Flow	232,656 m ³ /day DWF (NEP)			
Storm	FTFT Consent	20,698 cubic metres per hour (to be exceeded before discharge)			
	Tank Volume	68 litres per head of population			

Note: TSS: Total Suspended Solids
BOD: Biochemical Oxygen Demand
NH₃-N: Ammonia-Nitrogen
P: Phosphorus
DWF: Dry weather flow
NEP: National Environment Programme
FTFT: Flows to Full Treatment

4.4.19 The environmental permit requirements must be met at the Site by March 2017.

4.4.20 While short term measures may achieve some of the limits set in the new permit requirements, the age and condition of the primary and secondary treatment plant at the sewage works means they cannot be relied upon to meet the more stringent permit conditions from 2017, nor accommodate additional flows from population or climate change. The redesign and upgrade of the sewage works is the only means that will enable it to treat sewage to a sufficiently high standard to meet the permit requirements, and to adapt to future treatment needs.

4.4.21 Discussions with the Environment Agency in respect of the 2017 permit requirement have concluded that this 'step change' in the quality of the effluent means that new treatment processes need to be constructed.

4.5 Strategic Need for the Deephams Upgrade Scheme

4.5.1 The strategic need for the project was confirmed by the inclusion of the Deephams Sewage Works Upgrade as a named project within the National Policy Statement for Waste Water (2012). Together, the National Environment Programme (NEP) and the National Policy Statement for Waste Water provide requirements to:

- Improve water quality within Salmons Brook and the River Lee;
- enable compliance with Directives, regulation and policy governing the discharge of treated wastewater effluent; and
- provide sufficient storm capacity to meet growth within the Deephams catchment.

4.5.2 The Government's NPS for Waste Water, which is a material consideration to the Upgrade, confirms at paragraph 2.6.3 that *"The need for improvement of waste water treatment at Deephams STW is driven by European and national statutory water quality requirements. The improvements are essential to ensure that Salmon's Brook and the River Lee (to which it flows) meet environmental quality standards to comply with the Freshwater Fish Directive, and Water Framework Directive and to ensure that there is no deterioration in the current classification as a result of increased volumes of discharge"*.

4.5.3 Deephams Sewage Works lies within the Thames catchment within the Thames River Basin District. The River Basin Management Plan published in December 2009 by the Environment Agency identifies water quality as being a major issue within the catchment. The Management Plan makes it clear that improvements to Deephams Sewage Works are one of the key actions for the catchment.

4.5.4 Consequently, the improvements needed for Deephams Sewage Works are confirmed within the Environment Agency's NEP. The NEP lists all the environmental improvement schemes that the Environment Agency considers are necessary to ensure that water companies meet European and national targets related to water.

4.6 Benefits Arising from the Deephams Upgrade Scheme

4.6.1 There are a number of benefits arising from the Deephams Upgrade that are separate from the need to meet the requirements of the environmental permit but that are nonetheless vital to the development of a more modern sewage works for

North London. These are set out below.

(i) Meeting the policy need to improve water quality

- 4.6.2 Alongside the NPS for Waste Water, and the requirements of the new environmental permit, there is a raft of planning policy that seeks to protect and improve water quality both nationally, within London and specifically within the Borough of Enfield.
- 4.6.3 The Government's National Water Strategy is set out in Future Water (February 2008). The Strategy aims to improve, by 2030, the quality and ecology of the water environment. The Water White Paper 'Water for Life' (December 2011) sets out the current Government's plans for the water industry. A key component of the White Paper is to sustainably improve water quality in the natural environment and to meet the Government's obligations under European Directives.
- 4.6.4 Considering the need to protect the environment from pollution the National Planning Policy Framework (2012) explains at paragraph 109 that "*The planning system should contribute to and enhance the natural and local environment by ... preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of ... water ... pollution*". When considering the evidence base for future developments paragraph 162 of the NPPF advises that "*Local planning authorities should work with other authorities and providers to: assess the quality and capacity of infrastructure for ... water supply, wastewater and its treatment ... and its ability to meet forecast demands*".
- 4.6.5 It is clear therefore that National policy and material considerations applicable to the management of water resources and the provision of wastewater treatment recognise the need for the proposed development.
- 4.6.6 The River Thames, the canal network, and other tributaries, rivers and streams (including Salmons Brook and the River Lee) and open water spaces are collectively defined in the London Plan (2011) as the Blue Ribbon Network (Map 7.5). Policies 7.24 – 7.30 of the London Plan seek to protect and enhance the attractiveness, biodiversity and landscape value, and multi-functional nature of the Blue Ribbon Network. These work in tandem with Policy 5.14 of the London Plan (Water Quality and Wastewater Infrastructure) which states that:

"Strategic

A The Mayor will work in partnership with the boroughs, appropriate agencies within London and adjoining local planning authorities to:

- a ensure that London has adequate and appropriate wastewater infrastructure to meet the requirements placed upon it by population growth and climate change*
- b protect and improve water quality having regard to the Thames River Basin Management Plan.*

Planning decisions

C Development proposals to upgrade London's sewage (including sludge) treatment capacity should be supported provided they utilise best available techniques and energy capture."

- 4.6.7 The combined importance of London's Blue Ribbon network and the quality of the water held within it is further emphasised by paragraph 5.58 of the London Plan which explains that:

"Most of London's waterbodies fail to achieve 'good' ecological status/ potential as set out in the Thames River Basin Management Plan. This sets out the requirements of the Water Framework Directive. Sources of pollution include misconnections of sewerage to surface water drains, contaminated run-off and storm sewage. ...

Effective wastewater infrastructure is fundamental to sustainable urban life and therefore investment and expansion are required. Currently, Thames Water is implementing plans for additional sewage treatment capacity at several major works

...

While the impacts of these works need to be minimised and mitigated, it is nevertheless essential that a positive planning approach is in place to support this investment..."

- 4.6.8 Unless the proposed Upgrade is implemented, the Deephams Sewage Works will be unable to meet future effluent quality standards and provide the necessary treatment capacity and will therefore fail to meet policies that seek to protect and enhance water quality.
- 4.6.9 Paragraph 7.17 of the London Borough of Enfield Core Strategy (2010) states that *"The London Plan notes that water is an increasingly scarce resource for which there is rising demand. Hotter drier summers due to climate change combined with the predicted growth in Enfield's population may increase overall water demand, whilst reducing availability and placing further pressure on water quality"*.
- 4.6.10 Reflecting this, Core Policy 21 makes it clear that *"The Council will work with developers, residents and water supply and sewerage companies to ensure that Enfield's future water resource needs, wastewater treatment and drainage infrastructure are managed effectively in a coordinated manner by: Ensuring that water supply, sewerage and drainage infrastructure is in place in tandem with development, to accommodate the levels of growth anticipated within the Borough"*.
- 4.6.11 The policy also goes on to specifically recognise that *"In order to improve water quality in the Borough during the life of this Plan, Thames Water Utilities Ltd plan to improve/redevelop Deephams Sewage Treatment Water Works"*.
- 4.6.12 Policy 32 of the Core Strategy goes on to require that *"The Council will work with its partners to minimise ... water ... pollution In particular, new development will be required to: ... Ensure that water quality will not be compromised, and to secure, where appropriate, improvements to water quality. The Council will work with partners, particularly the Environment Agency, to seek improvements to the water environment in adherence with the Water Framework Directive and as per the programme of measures set within the Thames River Basin Management Plan..."*.
- 4.6.13 Paragraph 8.49 adds that *"Water quality can be improved through a number of measures including the effective design, construction and operation of sewerage systems and sewage treatment plants..."*.
- 4.6.14 The provisions of the Core Strategy are reinforced by Monitoring Indicator 32 of the Core Strategy 'Pollution' which sets a target to increase the percentage of Enfield's

rivers and canals which are rated as fair or better in terms of their chemical and biological water quality.

- 4.6.15 Both the London Plan and the Enfield Core Strategy therefore identify the essential need for the water quality within the Blue Ribbon network, including the River Lee and the River Lee Navigation, to be improved consistent with European and national objectives. They make it clear that the provision of modern effective wastewater treatment capacity at Deephams Sewage Works is central to this need.

(ii) Meeting growth requirements within the Deephams catchment

- 4.6.16 The Deephams Sewage Works catchment area includes land within the London Boroughs of Enfield, Haringey, Waltham Forest and Barnet and also extends into the counties of Hertfordshire (Borough of Broxbourne and Welwyn Hatfield Borough Council) and Essex (Epping Forest District Council).
- 4.6.17 The Adopted London Plan anticipates that there will be significant growth and regeneration in North London, including through planned redevelopment and enhancement within identified opportunity areas. London Plan Policies promote sustainable growth, with the provision of necessary infrastructure and services to support existing and new sustainable communities, including access to employment and services, exemplary approaches to water, energy and water use, management and provision.
- 4.6.18 Adequate sewage treatment provision is a key component to achieving sustainable communities with London Plan Policy 5.14 explicitly supporting the provision of necessary new infrastructure whether to accommodate growth or to improve environmental quality. Part C of policy 5.14 states that “*Development proposals to upgrade London’s sewage (including sludge) treatment capacity should be supported provided they utilise best available techniques and energy capture*”.
- 4.6.19 The main focus of growth and regeneration within the Deephams catchment will be within that part of the catchment that lies within the Upper Lee Valley Area of Opportunity. The Adopted London Plan anticipates that across the 3884 hectares that make up the Opportunity Area, 15,000 jobs will be created and a minimum of 9,000 new homes will be constructed in the plan period up to 2031. In addition to this, each Borough has other development proposals set out within their respective Local Plans or Local Development Frameworks.
- 4.6.20 The Greater London Authority (GLA) published the Upper Lee Valley Opportunity Area Planning Framework in July 2013. The Framework identifies the need to secure water quality improvements within the Lee Valley to support planned regeneration and to improve recreational opportunities within the valley.
- 4.6.21 The Deephams Sewage Works currently serves a Population Equivalent (PE) of 891,000 (as of 2011). To meet the level of growth proposed within the catchment and to fulfill its statutory duty to treat and dispose of sewage, Thames Water is forecasting that the capacity of the sewage works needs to be increased.
- 4.6.22 The Upgrade will increase the treatment capacity of the sewage works, from a PE of 891,000 (2011 base year) to a PE of 989,000. The increased capacity is designed to accommodate planned growth within the catchment, calculated by Thames Water using population projections and other information published by the GLA and local

Councils. The forecast increase in capacity is derived from the GLA 2012 demographic projections, issued in December 2012 and updated in February 2013, which when combined with data from other local Councils resulted in a forecast PE increase for the Deephams catchment of 89,000 over the period 2011 to 2031. Thames Water then added a further 10% to the forecast growth to provide for uncertainty and variation in the forecasts, which equated to the total forecast capacity for the Upgrade of 989,000 PE.

- 4.6.23 The existing sewage treatment infrastructure at Deephams Sewage Works does not have spare capacity to accommodate the forecast increase that is required. The constrained nature of the Site also means that physical extension or modification to the existing infrastructure, within the site boundary, is not readily achievable.
- 4.6.24 It is therefore considered that, the Deephams Upgrade will play an important role in accommodating future growth planned by the GLA and Councils within the catchment.

(iii) Providing a fit for purpose sewage works for North London

- 4.6.25 Although the Deephams Sewage Works has undergone significant investment and upgrading, the fundamental elements of the sewage works remain as originally constructed in the 1950's and 1960's. The inherent hydraulic problems across the Site, given its flat nature and lack of sufficient head of flows to push through the sewage works treatment stages, remains. In conjunction with the need to deliver the 2017 step change in discharge consent quality, and to accommodate growth in the catchment, it is considered that there is an overwhelming need to provide a modern sewage treatment facility.
- 4.6.26 This modern facility must meet the long term needs of the catchment in a form that is consistent with the regeneration objectives of the locality, will deliver improved standards of water quality and environmental management, including odour attenuation, and meet the rising challenges being set by climate change and the need for ever greater energy efficiency.
- 4.6.27 In combination, and whilst sustaining the core function of providing for the safe and effective treatment of sewage, the proposed development meets the need set by development plan policy for it to be fit for the purpose of meeting and exceeding the requirements of development plan policy. The proposed development will provide the means by which policies governing water quality, nature conservation, energy use, climate change and sustainable development can be accorded with by the Deephams Sewage Works through the life of those policies and beyond.

(iv) Delivering significant reductions in odour emissions

- 4.6.28 The generation of odours is an unavoidable consequence of receiving and processing wastewater/sewage. The existing operation of the Deephams Sewage Works generates odour emissions that have been identified by LBE and the local community through pre-application consultation as one of the most significant issues to be addressed in the Upgrade planning application.
- 4.6.29 The Waste Water NPS (2012) recognises that odours from wastewater infrastructure can have a significant adverse impact on the quality of life of individuals and communities, and identifies mitigation measures that can be adopted

to reduce this impact. London Plan Policy 7.14, LBE Core Strategy Policy 32, and LBE Draft DMD Policies 64 and 65 all seek to ensure that the impacts of pollution generally, and odour specifically, are assessed as part of the consideration of planning applications, and that measures are secured to mitigate impacts on amenity. These policies seek to ensure that new development is air quality neutral.

- 4.6.30 A key benefit of the Upgrade is that the combination of new plant and equipment, together with the odour control covers and odour control units, will significantly reduce the odour emissions from the Deephams Sewage Works. This will result in all residential and commercial properties that currently experience odour from the sewage works receiving a significant reduction in odour, with a 99% reduction in the number of properties most or moderately affected by odour. This will benefit individual properties, and support planned regeneration within the Borough.

4.7 The Implications of Failing to Meet the Need

- 4.7.1 Thames Water has a statutory duty under Section 94 (1) of the 1991 Water Industry Act:

(a) to provide, improve and extend such a system of public sewers (whether inside its area or elsewhere) and so to cleanse and maintain those sewers as to ensure that that area is and continues to be effectually drained; and

(b) to make provision for the emptying of those sewers and such further provision (whether inside its area or elsewhere) as is necessary from time to time for effectually dealing, by means of sewage disposal works or otherwise, with the contents of those sewers.

- 4.7.2 To fulfil its statutory duty, Thames Water therefore has to plan to meet future sewage flows both within the sewer network and at its sewage treatment works. Failure to do this would breach this statutory duty, and as such, Thames Water does not have a “do nothing” scenario or option in relation to the Deephams catchment. Given the identified need for improved effluent quality, increased capacity, and a modern sewage treatment facility, Thames Water must upgrade the Deephams Sewage Works.

- 4.7.3 Failure to improve effluent quality in accordance with the environmental permit being implemented in 2017 would result in Thames Water breaching the terms of its permit and potential enforcement action by the Environment Agency.

- 4.7.4 Failure to deliver sufficient treatment capacity for the Deephams catchment threatens to undermine significant regeneration and growth proposals, both focused within the Upper Lee Valley, and the wider catchment. A lack of capacity at the sewage works could lead to delays to the implementation of planned development projects, which could have a major negative impact on job creation and planned regeneration within the catchment.

- 4.7.5 Failure to deliver a modern sewage treatment facility would require the continued reliance upon infrastructure that is coming to the end of its useful life, and major investment would be required on an ongoing basis in order to secure the continued operation of the existing works. Failure to deliver the modern facility would also require the continuation of the current energy and process inefficient operations at

the existing sewage works, with consequential environmental impacts in terms of CO2 emissions and amenity impacts including through odour generation.

- 4.7.6 Failure to deliver the planned significant reduction in odour emissions would mean that the existing odour from the site would continue, with the number of residential and commercial properties affected remaining at the same level as currently.
- 4.7.7 For all of these reasons, Thames Water considers that there is no option but to meet the identified need through the delivery of an Upgrade to the Deephams Sewage Works.