

7 UTILITY SERVICES AND WASTE

7.1 INTRODUCTION

- 7.1.1** This chapter of the Environmental Statement has been produced by Arup and assesses the effects of the proposed development on the existing utility network and waste services. Due to the nature of urban services (utilities) the study area extends beyond the planning application boundary to include selected sections of the existing utility network, which would be likely to form the points of supply to the proposed development. This chapter has therefore been structured around individual utilities, rather than geographical areas.
- 7.1.2** The assessment has been undertaken to identify the effects based on the complete proposed development. It is important to note that the development is planned to be undertaken in a phased manner and the utility provision would, where possible, be designed accordingly. However, not all utilities lend themselves to phasing. Where appropriate, some discussion on the effects of phasing has been included where utility providers have indicated this is feasible.
- 7.1.3** In addition, the Upper Heyford, Airbase Site Plan (Drawing N.0111_16C) shows significant aspects of on-site provision and the Context Plan (Figure L3) indicates the potential routing of off site utility provision.
- 7.1.4** Surface water drainage is dealt with in Chapter 13 of this Environmental Statement.
- 7.1.5** The effects of noise, dust and traffic from construction works associated with utility services are considered in Chapters 6, 9 and 11 and the relevant topic based specialist reports such as the Transport Assessment and Sustainability Statement. Construction Waste is also dealt with in Chapter 8.

7.2 METHODOLOGY AND ASSESSMENT CRITERIA

Assessment

- 7.2.1** The assessment methodology for the EIA as a whole is described in Chapter 2. This chapter considers the specific methods of assessing the impacts related to utility services only. The assessment considers the effects on existing utilities of having to provide new supplies to the site, both physically and as a resource; diverting existing utilities to facilitate the proposed development; and the effect on existing utilities of constructing and operating the proposed Heyford Park development.
- 7.2.2** The assessment comprised:
- Site visits;
 - Reviewing existing utility records to establish a preliminary baseline;
 - Estimates of utility demands for the proposed development;
 - Consultation with the utility companies and operators to confirm the capacity of existing networks and to establish the works that may be required on and off site to meet the predicted demands, and also to establish the ability to meet the demands in phases to reflect the potential build-out programme;
 - Assessment of impacts, including during construction and during operation, taking into account mitigation included in the proposals; and
 - Identification of possible further mitigation measures and options, where appropriate.

Significance Descriptors

7.2.3 The following significance descriptors are used in the assessment of effects in this chapter:

- Major – effects of the development of greater than local scale;
- Moderate – effects of the development that may be judged to be important at a local scale (i.e. in the local planning context);
- Minor – effects that are of low importance in the decision making process; and
- Negligible – effects that are below normal levels of perception and are thus not material.

7.2.4 The following terms are used to identify the time-scale of impacts:

- Short-term, <12 months;
- Medium term, 1–5 years; and
- Long term, >5 years

7.2.5 Considerations in applying the above criteria to a typical activity of installing a new utility supply to the site would include:-

- Identifying the nature of the work required; e.g., excavating a length of trench along an existing road, connecting the new pipe to an existing pipe;
- Estimating the duration of the work required; typically less than 12 months;
- Identifying in particular whether there are any significant long term effects on either the utility being considered or other utilities that might be adjacent or affected indirectly; and
- Identifying whether the quantum of the supply required has an effect remote from the site and/or requires other work to mitigate the reduction in remaining available utility capacity.

7.3 CONSULTATION

7.3.1 Unlike other aspects of the Environmental Impact Assessment, the effects of the proposed development on utility networks is generally not assessed against nationally or locally specified criteria. Effects are typically addressed in terms of the works required to provide the utility demands and the resultant physical changes required to existing networks to provide the new demand and also any issues relating to residual utility capacity. The potential effect is usually assessed in conjunction with the relevant utility company.

7.3.2 During preparation of the Environmental Statement, meetings have taken place with the utility companies and operators and reviews have been held to ensure the information contained herein is up to date.

7.3.3 Consultation has been conducted with all the relevant statutory utility providers and agreement reached on technically feasible means of providing the relevant utility supplies to the site. The statutory consultees include the Environment Agency and Oxfordshire County Council.

7.3.4 Estimated demands for the proposed development have been issued to the providers, followed by discussion of those forecast loads. Options have been considered and the likely off site works, including any reinforcement required for servicing the site, have subsequently been identified, together with programme information and phasing where appropriate.

7.4 CONTEXT TO UTILITY PROVISION

Power

- 7.4.1** The incumbent infrastructure electricity company is Scottish and Southern Energy Plc (S&SE). They would be the default provider of new electrical infrastructure and are responsible for the operation and maintenance of the existing electrical distribution assets surrounding the site.
- 7.4.2** The current electricity supply to the former airbase is provided from an intake sub-station located off the eastern end of Camp Road. The private HV network is maintained by North Oxfordshire Consortium (NOC) through a contract with Southern Electric Contracting (SEC) - part of S&SE.
- 7.4.3** S&SE have identified available capacity within the existing sub-station as the most viable means of providing the required electrical supply to the site. Alternatively, the available sub-station capacity may be supplemented through connection with the alternate local area network close to the site and through the use of alternative renewable energy supplies and energy reducing measures, thereby generating efficiency in the regional S&SE supply.
- 7.4.4** EDF Energy, National Grid Company and EON Energy are a number of potential alternative electrical infrastructure providers to the site. At present similar technical solutions to S&SE can only be considered for providing power to the site in the absence of detailed available capacity and infrastructure specification of the local and wider area network.

Gas

- 7.4.5** During consultation with Southern Gas Networks (formally known as Transco), the provider of gas infrastructure, various alternative supply arrangements and phasing options have been discussed. Southern Gas Networks has identified the existing gas intake station to be the most suitable point of connection dependant on the site supply requirements.
- 7.4.6** Gas is supplied to the former airbase via a medium pressure main which runs along Kirtlington Road, to the west of the site. A gas intake station is located at the western end of the site, north of Camp Road.
- 7.4.7** Southern Gas Networks and S&SE have also been consulted during the consultation process to identify alternative potentially beneficial solutions. Alternative solutions may include a Combined Heat and Power Plant which could reduce the electrical demand for the increased development, although the efficiency would be reduced due to no source requirements for a central heating system. Therefore this option is considered not to be commercially viable and sustainable.

Potable Water

- 7.4.8** Thames Water Utilities Ltd, the incumbent water company, has been consulted and proposals for supplies to the new development have been identified.

- 7.4.9** Thames Water Utilities Ltd have previously undertaken flow and pressure tests which have confirmed that the proposed development can be served from their existing supply network, together with a new 300mm water main along the length of Camp Road to connect both ends of the local network.
- 7.4.10** The works that Thames Water Utilities Ltd consider may be required include relining existing mains, changes to the existing network management, new and revised pumping arrangements and lengths of new tunnel and pipe work and associated shafts. These works are considered by Thames Water Utilities Ltd to be part of their own network development.

Foul Drainage

- 7.4.11** Thames Water Utilities Ltd is the incumbent drainage authority providing public surface and foul drainage to the area, typically via existing combined sewers. Detailed meetings, discussions and design studies have taken place with Thames Water Utilities Ltd to determine the available spare capacity of the existing combined sewer network in order to establish available foul flow capacity.
- 7.4.12** The existing private sewerage network and the treatment works, which is located some 300m south of Camp Road, have capacity to accommodate the proposed development. Thames Water Utilities Ltd has previously assessed the condition and capacity of these works and further details are contained in section 7.5.
- 7.4.13** On the basis that existing surface water flows from the former RAF Upper Heyford previously discharged to the existing foul sewers at several locations via infiltration or direct connection, these elements of the private network will not be suitable for adoption by Thames Water Utilities Ltd. Thames Water require separation of surface water and foul flows and would not adopt pipes that have deteriorated and allow ground water ingress

Waste

- 7.4.14** The Council collects household refuse from residential premises and also offers a service for commercial waste from smaller business premises using prepaid sacks and labels. Larger businesses should contact a private waste contractor for services.
- 7.4.15** The recycling of waste products is becoming more important to businesses both as a potential form of income, as a means to reduce expenditure on waste disposal and to help divert waste from landfills. At present, this household waste is taken to landfill site at Ardley. Garden waste is delivered to Helmdon, however a new facility is proposed at Ardley in the next 6 months. Dry recycling is taken to the outskirts of Milton Keynes.
- 7.4.16** Waste material arising from the proposed residential and business premises will have an effect on the available void space in Oxfordshire. A significant proportion of the waste material generated from the proposed residential units and business premises would be classified as Type C waste. An estimate of the amount of domestic waste material which may require off-site disposal arising from the proposed 1075 unit development is approximately 1200 tonnes per year. This figure takes into account refuse vehicle collection, other

collections, wastes from households taken to civic amenity sites and materials collected separately for recycling.

- 7.4.17** The proposed development envisages about 1075 new dwellings and it is estimated that this would increase the average tonnage of Type C waste sent to landfill by 880 tonnes. This represents less than 0.43% of the average annual tonnage of Type C waste in Oxfordshire.
- 7.4.18** Government figures for all councils on recycling in 2005/06 list Cherwell at 14th out of 354 collection authorities in the country. Cherwell is rated as the most successful Oxfordshire recycling District and is at the top of the table for the whole South East region. Cherwell also has a very good track record in recycling, specifically related to Heyford Park, and will continue to improve this in the future.

Communications

- 7.4.19** Information has been collected from possible telecommunications providers to establish what existing equipment is located in the surrounding area. BT and NOC have provided details of the telecomms infrastructure in the area. Further details are provided in section 7.5.
- 7.4.20** Telecommunications are supplied (and maintained by British Telecom) to the site via the former military exchange located within one of the hardened buildings (Building 123) to the north of Camp Road.
- 7.4.21** Other telecommunications systems include a PA system, however it is confirmed that this will be removed and as such will not be considered as a constraint.

7.5 THE EXISTING SITUATION – BASELINE CONDITIONS

Utilities Description: Overview of Current Situation

- 7.5.1** The existing networks for power, water, gas, foul and storm sewerage and telecommunications predominantly follow the routes of the main highways throughout the site, although several minor branches are situated in the gardens of existing properties and in private spaces and hence are either not constructed to adoptable standards or are in a very poor condition.
- 7.5.2** The substantial portion of the site lying to the north of Camp Road is sparsely serviced, the only significant element being the HAS used as commercial warehouses and Thames Valley Police Offices. A combination of existing relatively small diameter local foul sewers and storm sewers are located both along existing roads and footways and also through open spaces and under private properties.

Power Supply

- 7.5.3** Scottish & Southern Energy's infrastructure comprises high voltage circuits, typically at 11kV and low voltage cables typically at 415V and 240V, located under highways and footpaths and private properties. Electricity supplies to the former airbase are currently provided from an intake sub-station located off Camp Road to the east of the site. See Figure U.A01 and Figure U.A02, Existing High Voltage Electricity Cable Layout.

7.5.4 Supplies are brought to this sub-station at 33kV and are reduced to 11kV. They are then distributed around the site at this voltage via a network of 65 private sub-stations (of which 62 are live). The private HV network is maintained by NOC through a contract with Southern Electric Contracting.

Water Supply

7.5.5 The main water supply to the former airbase is currently provided by two mains, a 9" diameter and a 7" diameter, which connect to the public mains network in Upper Heyford Village to the west of the site. See Figure U.A04 and Figure U.A05, Existing Water Supply Layout.

7.5.6 These mains are distributed around the airbase via a network of private pipes which feed a number of high and low level storage tanks.

7.5.7 There is a secondary backup supply from Ardley Reservoir approximately 2.3km to the east of the site.

7.5.8 The existing private mains network has historically lost significant quantities of water through leakage. In recent years a systematic system of leak detection has been introduced which has resulted in noticeable reduction in water loss.

7.5.9 Thames Water Utilities Ltd have indicated that they would be unlikely to adopt the mains due to their age and possible condition, given a history of pipe bursts. It is therefore possible that all water mains may have to be replaced and as such would not be a constraint on the proposed development.

Foul Sewage

7.5.10 Foul drainage from the existing site is currently treated by a number of on-site sewage treatment plants. Within the Trenchard area (i.e. north of Camp Road) of the base there are a number of small "package" type treatment facilities which serve small groups of buildings.

7.5.11 The main sewage treatment works, which serves all of the residential areas, the office and workshop areas and the former hospital, educational and recreational sites, is located approximately 300m south of Camp Road to the east of the former airbase.

7.5.12 All of the existing treatment plants are currently owned and operated by NOC and Discharge Consents from the Environment Agency are in place for each of those plants currently operational.

7.5.13 Sewage from the former airbase is collected in two private sewerage networks which transport it from both the north and south of Camp Road, through the southern residential areas and approximately 200m across a field outside of the site boundary to connect to the inlet works of the treatment plant, see Figures U.A07 and U.A08. Several private foul pumping stations are located throughout the site and rising mains connect to the gravity foul network.

7.5.14 Thames Water Utilities Limited has stated that for the private foul network to be adopted, the current condition and extent of infiltration must be corrected. A recent CCTV and drainage study has also confirmed

that surface water pipes directly connect into the foul sewer network and that groundwater infiltration is also largely present.

- 7.5.15** Thames Water Utilities Ltd have also carried out a survey of the existing Sewage Treatment Works and have concluded that the works has capacity within its current facilities to cater for projected flows from the development. Remedial works will however be required to modernise the plant to bring it up to current adoption and safety standards.

Gas Supply

- 7.5.16** Gas is supplied to the former airbase via a medium pressure main which runs along Kirtlington Road, to the west of the site. A gas intake station is located at the western end of the site, north of Camp Road.
- 7.5.17** From this intake station, gas pressure is reduced and distributed around the former base via a network of private mains. A main runs along the northern side of Camp Road, transferring to the southern side around the main entrance and returning to northern side at the western end of the Officers' Mess. The gas mains generally follow the road corridors. See Figure U.A10 and Figure U.A11.
- 7.5.18** Through consultation with Southern Gas Networks, it is unlikely that the existing mains would be taken over because of their age and likely condition. It is therefore possible that all gas mains may have to be replaced and as such would not be a constraint on the proposed development.

Telecommunications

- 7.5.19** Telephone supplies to the former airbase are owned and maintained by British Telecommunications. A small local on-site exchange serves the surrounding villages outside the site boundary.
- 7.5.20** Supplies to the airbase itself are provided via the former military exchange which is located in one of the hardened buildings to the north of Camp Road (Building 123). This is maintained by British Telecom, although it is still in the ownership of NOC.
- 7.5.21** BT has a variety of cables running through the site adjacent to the roads. In the existing development to the north of Camp Road, cables appear to run within the road corridors. In the existing development to the south of Camp Road, cables do not follow the road pattern and appear to run in back gardens, see Figure U.A13 and Figure U.A14.
- 7.5.22** MCI Inc. has ducts and cables (formerly owned by WorldCom) close to the east of the site that would be unaffected by the proposals.
- 7.5.23** Other telecommunications systems include a PA system (Figure U.A16 and U.A17), however it is confirmed that this will be removed and as such will not be considered as a constraint.

Central Heating System

- 7.5.24** The existing central heating system (Figures U.A18 and U.A19) is also confirmed to be removed and as such will not be considered as a constraint.

Physical Constraints

7.5.25 The following constraints to development of the utility network have been identified:

- The existing foul sewer connections to the Sewage Treatment Works currently cross through an adjacent landowners field and as such the existing location and invert level is fixed.
- Existing utility congestion, along Camp Road in particular, may restrict the ability to locate new utilities in the preferred locations;
- Non-adoptable roads in the Trident Area, north of Camp Road, restrict the development levels to tie-in with the existing carriageway and footway levels. New utilities would be constructed to adoptable standards but would be in 'private' roads and as such special access agreements must be sought with the respective utility companies to ensure they have un-obstructed 24hour access.
- Existing mature trees adjacent to roads in the Conservation Area north of Camp Road will restrict any new utilities from being constructed in the existing road verges and footways. A new location within the carriageway is likely to be required to overcome the footway constraints.

Study Limitations

7.5.26 The following limitations have been identified during the course of compiling the baseline:

- Information on the location of utilities in surrounding streets has been compiled from several sources of varying age and status. The accuracy of this information has not yet been confirmed by intrusive route proving exercises; and
- Telecommunication providers have provided limited information about services around the site.

7.6 PROPOSALS

7.6.1 The estimation of new utility demands for the Heyford Park site has been based on appropriate unit rates for the different types of buildings and includes a further provision to serve the public realm (e.g. street lighting). The overall demands for power, gas, water and telecoms, together with the forecast foul discharges, have been discussed with the respective utility companies. They are based on a set of realistic 'worst-case' assumptions.

Assumptions and Study Parameters

7.6.2 The following assumptions and study parameters form part of the assessment of the proposed development and its 'worst-case' effects on utility services.

- Utility works on and off site during all phases of the proposed development and also during any future maintenance would be undertaken in accordance with the provisions of the New Roads & Street Works Act (NRSWA) for adopted highways and privately owned estate roads alike.
- The NRSWA provides a legislative framework for street works activities by statutory undertakers, including public utilities. The aim is to balance the respective statutory rights of highway authorities and undertakers to carry out works in the highway against the right of the users to expect the minimum disruption from street works. The obligations under the act include notification of the works, estimating the duration of the works with possible penalties for late completion, co-ordination of the works, the requirement to minimise inconvenience to road and pedestrian users and safety.
- A Base Management Plan would be established and would ensure that all activities relating to the phasing and installation of on-site utilities are co-ordinated.
- Off site supply/reinforcement requirements for this site would not be altered significantly by other future developments adjacent to Heyford Park.

- Desk studies and consultations with utility providers indicate that sufficient space is available within the local road network for off site utility reinforcement and new supplies. In due course this would be confirmed by undertaking excavation and inspections to confirm the feasibility of the route chosen. In the event that such space was not available, alternative routes would be identified and subsequently validated.
- Water efficient fittings will be installed wherever possible. For example commercial office buildings would be fitted with dual or low flush toilets.
- Measures to mitigate the impact of installing new utilities on-site would include specification of working hours, consideration of noise when selecting plant and directing vehicles along agreed local access routes. Method Statements for specific activities would be produced.

7.6.3 The following control measures would be followed for the diversion and installation of utilities on site:-

- Appropriate selection of plant to mitigate noise, dust and vibration;
- Use of hoardings and screens to mitigate noise and dust transmission;
- Control of working hours and noisy activities;
- Use of water sprays to damp-down areas prone to dust generation;
- Use of vehicle and wheel washing facilities;
- Monitoring of control measures; and
- Control of surface water runoff from and into excavations.

7.6.4 Works would be programmed at the appropriate times of the year (e.g. summer months for gas), when utility demands are typically less.

7.6.5 As part of the on-site infrastructure works, the potential for residual ground contamination within any construction site would be confirmed prior to the start of any excavation work. This would be maintained when trenching is carried out for installation of new utilities as part of the development.

7.6.6 The off-site works required to install utility supplies to the site would potentially give rise to isolated, temporary noise, dust and air quality effects. Please refer to Chapters 6, 9 & 11 for noise dust and traffic from construction works. These impacts are controlled primarily via the NRSWA and any standard requirements of the Highway Authority.

Worst Case

7.6.7 There is no single “worst case” development scenario for utility services. Instead an individual “worst case” for each type of service has been assessed. The majority of impacts would be due to off-site works within the local area. Off site “worst case” works would include:

- New power supplies may be required from EHV electrical supplies north of the site to supplement the existing available capacity in the Heyford Park sub-station;
- New water supply connections from an existing main east of the site along Camp Road;
- New gas main network from the gas intake station to serve the whole development site;
- New foul sewer network to serve the proposed development to adoptable standards with connection to existing sewer outfalls at the Sewage Treatment Works;
- New connections for telecoms from the existing on-site BT Telephone exchange, requiring additional comms infrastructure within existing public roads.

7.6.8 Traffic management would be required within the surrounding residential and commercial areas while utility supply or reinforcement work is undertaken. More details are included in Chapter 6 and are therefore not discussed in detail in this chapter.

- 7.6.9** The phased implementation of the development and more particularly the phasing of utility supplies could affect utilities already installed. However, the majority of existing tenants will vacate the existing buildings on the site
- 7.6.10** Within the site, in addition to utility diversions required as a result of road re-alignment, further diversions and abandonment of existing utility supplies to buildings to be retained may be carried out. The utility diversions required could have short-term negative effects on the existing utility network.
- 7.6.11** Table U.01 below lists and describes the 'worst case' works, and identifies the assumed mitigation as described above.

Table U.01: Summary of Mitigation Measures		
Impact	Summary Description	Mitigation Assumed as Part of the Proposals
GENERAL		
Diverting existing utilities in local roads	To allow new road connections from site to tie into existing highway network	Co-ordination between utilities NRSWA, Highway Authority's standard requirements
Providing new utility supplies from off site locations to the site	New supplies along existing roads and footpaths could restrict tree planting and cause disruption as a result of maintenance requirements	Co-ordination between utilities NRSWA, Highway Authority's standard requirements
Trenching through potentially contaminated ground	When excavating trenches for utilities onsite there is a risk of encountering contaminated ground	Identification of potential for residual ground contamination prior to excavation work on site. If local contamination is found, either removal is required or localised stabilisation can be achieved subject to extent and degree of contamination.
Use of imported granular fill	Bedding and surround material for installation of services on site	Use of site-won material wherever possible for on site utilities.
POWER		
New power supplies to the site	Provision and quantum of new power supplies provides the potential for resilience in the supply to the site	Co-ordination required by utility companies NRSWA, Highway Authority's standard requirements

New power supply from east of the site	Laying of new 33kV cables in public roads. Estimated installation time is 1-year	Co-ordination between utilities NRSWA, Highway Authority's standard requirements
Utilising power supply from Camp Road	Electricity taken from a bulk supply point with significant spare capacity	Regional Electricity Company required to enhance network to provide further capacity for background growth.
Operation of primary substation on site	The effect on other utilities of operating and distributing electricity around the site at 11kV	Co-ordinated design Some screening of adjacent copper based telecom cables may be required
FOUL		
New foul water network (construction)	Additional/replacement/existing connections from the site to the public combined sewer in public roads	Co-ordination between utilities NRSWA, Highway Authority's standard requirements
New foul flow discharges from the site	Increased foul flows within an overall combined flow	Use of water efficient fittings in base build to reduce quantity of foul flows from the site Specification of new drainage infrastructure
Separation on site of storm and foul flows	Separate storm and foul sewers on the site provide improvements to the quantum of flow at the Sewage Treatment Works through prevention of surface water during storm events	Not Applicable
Construction of Foul Sewer Diversions on existing network	Re-routing of existing large diameter pipes requiring temporary interruption of flows	Works to be undertaken at times of low flow with adequate over pumping (or other) measures in place Construction control measures as listed in section 7.6
WATER SUPPLY		
New water supply connection via existing Camp Road connection (construction)	1600m length of new 300mm diameter supply pipe along Camp Road from the eastern end to Upper Heyford Village	Co-ordination between utilities NRSWA, Highway Authority's standard requirements
Operation of new supplies	Enhancement of existing local network provides additional spare capacity for site and also use by others	Not Applicable
Quantum of new potable supplies to the site	Demand for potable supplies to the site, which is a function of occupier requirements and design.	Ensure water efficient fittings utilised as part of building design Limit new supplies and off site works required to those absolutely necessary and thereby ensure a sustainable approach to water supply

GAS		
Operation of existing gas intake station	New LP gas infrastructure network to suit revised master plan	Co-ordination between utilities NRSWA, Highway and Local Authority's requirements
Additional gas consumption as a result of development	Operation of new gas supplies to the site via new connections to the low pressure network	All new buildings designed to achieve energy performance above part L building regulations
COMMUNICATIONS		
New comms duct network on site (construction)	Laying new ducts along proposed roads and footpaths	Co-ordination between utilities NRSWA, Highway Authority's standard requirements
Installation of additional comms cables within the site along previously installed ducts (construction)	Lifting of chamber covers and providing additional comms cables	Co-ordination between utilities Construction control measures as listed in section 7.6
Operation of additional comms services to the site	Utilisation of existing capacity at the telephone exchanges	Relevant telephone company required to expand facilities to ensure appropriate capacity is provided.
WASTE		
Disposal of municipal and commercial/industrial waste	Municipal waste would be collected and disposed of by Cherwell District Council. Disposal of commercial/industrial waste would be the responsibility of individual occupiers and would be carried out by contractors.	Legal requirements of the Environmental Protection Act 1990 Part II including the 'Duty of Care'.

7.7 ASSESSMENT OF EFFECTS

Power Supply to the Site

- 7.7.1** Following consultation with S&SE and alternative electrical infrastructure providers it has been established that power supply in the worst case, could be provided via an initial upgrade to the existing on-site sub-station, followed by a secondary supply at 33kV taken from the existing grid supply point to the east of the site. The existing sub-station is owned by NOC but operated by S&SE. The use of a supplementary power supply to the site represents the 'worst case' impact in terms of street works.
- 7.7.2** The proposals may require at some stage of development supplies from the network to the east of the site but it may not be practicable to deliver this infrastructure from the outset. The construction of the off-site route is likely to have short-term duration and the impact on urban services is assessed as positive negligible in the local area.

7.7.3 S&SE has confirmed that at present the existing on-site sub-station has approximately 3MVA of spare capacity and sufficient space to expand the bus bar and switchgear to provide further supplies to Heyford Park. S&SE is unable to reserve or commit this availability to Heyford Park without financial commitment.

On-site power distribution

7.7.4 On site a 33/11kV main sub-station is currently provided, which serves as the electrical supply point for the site. The majority of buildings are connected to 11kV supplies via on site ring mains via a ducted cable network along internal site road corridors.

7.7.5 Individual buildings or groups of buildings are supplied via one of the existing 65 small sub-stations that transform power from 11kV to 415V. Typically these sub-stations are located at ground floor level outside buildings. The approach for the proposed development would be to rationalise the number of sub-stations to produce an efficient electrical distribution network.

7.7.6 Electrical services within the site are required to serve varying elements of infrastructure including security, street and amenity lighting, and illuminated signage, both statutory and non-statutory. These supplies are distributed around the site using buried duct and chamber systems where necessary and direct buried cables elsewhere.

7.7.7 Several sub-stations to the north and south of Camp Road are likely to be removed to suit the proposed development. The condition of the existing HV cabling and upgrade requirements for the existing sub-stations can only be determined by Scottish & Southern Electric following a detailed survey. This also includes the infrastructure across the wider airfield.

7.7.8 The impact of installing and operating the 11kV distribution on site, in conjunction with the 33kV/11kV primary sub-station and new supplies to the site would have a negligible effect long term on the existing and proposed utilities network and would provide future opportunities to enhance local capacity and supply, which would have a negligible significance. (positive impact).

Gas

7.7.9 Based on estimated site demands, Southern Gas Networks would require replacement of all the existing low-pressure mains and, where appropriate, extended or proposed mains to suit the revised masterplan. Existing gas mains to residential properties that will remain and also the wider airfield network is subject to investigation by Southern Gas Network and subsequent adoption agreement.

7.7.10 The new gas mains is likely to comprise primary and secondary networks in the existing footways, although phasing and gas main sizing is subject to detailed design by Southern Gas Networks. This is required given that the existing gas infrastructure is currently in a non-adoptable state. No reinforcement works or works remote from the site would be required to supply gas to the site. This would have a medium term, negative minor impact.

Potable Water

- 7.7.11** The 'worst case' scheme for supply of potable water to Heyford Park would be via Thames Water Utilities Limited mains. Local to the site the scheme would require new supplies to be provided via a new connection from existing Thames Water mains located to the east and west of the site along Camp Road.
- 7.7.12** In conjunction with Thames Water Utilities Limited, future water demands have been estimated and a hydraulic model for the proposed demands and the existing water supply network is required to be undertaken to confirm sufficient capacity for Heyford Park.
- 7.7.13** Taking into account the local works required, the impact of constructing the new water supplies to the site is considered to be medium-term and of positive moderate significance.
- 7.7.14** In addition to the requirement for local works, given the quantum of development and potential reduced capacity in the immediate network, the water supply solution may require further work remote from the site. Thames Water has yet to confirm that these works would form part of their regulated network development enhancement.
- 7.7.15** The introduction of new supplies to the site is considered to be of long-term local benefit and the reinforcement of the Thames Water network with increased availability of supply via new mains would provide a degree of enhancement.

Foul Drainage

- 7.7.16** Existing foul drainage is typically provided via separated sewers through and around the site in conjunction with some small diameter dedicated foul sewers that connect to the combined sewers. However, recent drainage surveys have indicated that the existing network has in part surface water direct connection and problems with infiltration. The existing infrastructure is deemed to be of non-adoptable standard.
- 7.7.17** The proposed foul drainage strategy would be to separate storm and foul flows within the development area south of Camp Road and only to utilise the existing foul sewers within the development areas that are to remain on site. If the roads to the north of Camp Road remain non-adoptable it would seem appropriate to retain those sewers to the north of Camp Road that are not affected by the proposed masterplan development and supplement the network with additional sewers as required. This would ensure that the minimum necessary works required to discharge foul sewerage is provided, although consent from Thames Water will be required for a 'private' connection if the sewage treatment works and new network south of Camp Road is adopted by Thames Water.
- 7.7.18** The impact and assessment of the proposed storm water drainage options is included in Chapter 13.
- 7.7.19** During the construction of the diversion works and new works, flows along the existing sewers will need to be very briefly interrupted to allow diversion of flows, although the majority of new construction would be off-

line and therefore not affect existing flows. The impact of the diversion works during construction is considered to be short term, negative and moderate.

- 7.7.20** Separate site foul drainage systems would be installed north and south of Camp Road within proposed road corridors. The systems would be designed to accommodate all sewage generated from the buildings. The sewers would be designed in accordance with adoptable standards and revert to public sewers.
- 7.7.21** Wherever possible, discharge from buildings and within the site would be via gravity sewers. This may not be possible everywhere, in which case lift stations and/or rising mains would be provided.
- 7.7.22** The issues associated with the proposed foul flows from the site including quantum of discharge, capacity of existing pipes within and outside the site and capacity at the existing Heyford Park Sewage Treatment Plant have all been discussed with Thames Water. Thames Water has identified that works are not required remote from the site and reinforcement is not required. Foul connections to existing pipes can generally be undertaken within the site boundary. The impact of these works during construction is considered to be short term, and of negative negligible significance since they would be unlikely to interrupt existing flows.
- 7.7.23** On the basis of the physical works required and the overall approach to storm and foul drainage discharge from the site, the impact of foul drainage construction works on the existing local network would be negative negligible. The impact of the operation of the site with respect to foul discharge is considered to be negative negligible since the flows would be within the capacity of the existing Sewage Treatment Works.

Waste

- 7.7.24** In the main, waste would fall into either domestic or industrial and commercial waste categories for disposal. It is estimated, based on maximum possible residential and commercial floor space scenarios, that the development could generate up to some 1,200 tonnes per annum of domestic waste and additional commercial waste when fully developed at current rates of waste production. These are considered to be 'worst case' in terms of domestic and commercial waste disposal, assuming that no recycling is carried out by any of the commercial waste producers.
- 7.7.25** Domestic waste would be collected and disposed of by the Cherwell District Council. To put this into context, the additional domestic waste estimated is 880 tonnes per annum. In a wider context, this is 0.43% of the total volume of domestic waste currently collected within Oxfordshire. This information is based on the most recent publicly available information from Cherwell District Council.
- 7.7.26** Current waste disposal techniques followed by Cherwell District Council are, where feasible, fortnightly kerbside collection of recyclable wastes (including cans, paper, glass and textiles) and collection of green waste.
- 7.7.27** Industrial and commercial waste would be the responsibility of the building occupants and would be collected by appropriately licensed waste management companies. This would be managed and disposed of through the facilities that are available at the time. Waste disposal techniques currently adopted for disposal of industrial and commercial waste are dependent on the type of waste produced but may include the segregation and

recycling of paper, cardboard and plastics. The majority of the remaining waste not suitable for recycling/recovery and any residue from the recycling facilities is sent to landfill for final disposal.

- 7.7.28** All waste management would be regulated by the requirements of the Environmental Protection Act 1990 Part II including the 'Duty of Care'. The disposal of any hazardous waste would be regulated under the Special Waste Regulations 1996.
- 7.7.29** It is likely that waste disposal techniques are likely to change, with potential for improvements in waste minimisation and recycling. Further steps could be taken to reduce waste generation. This would have a long-term, positive negligible impact. (see further mitigation, section 7.8).

Communications

- 7.7.30** A variety of communications companies have been contacted. With the exception of BT, all have indicated that, at this stage, their policy is not to commit to new infrastructure investment. In the absence of their own dedicated infrastructure to serve the site they have suggested that if particular customers (tenants) request supplies, they would seek means to provide that service through either:
- Installing additional ducts and chambers where required; or
 - Leasing ducts from other parties.
- 7.7.31** BT has significant infrastructure around and, to some extent, within the site. The point of BT connection to the site is via an existing Telephone Exchange within the site. The requirements for any reinforcement would be identified as and when spare capacity is utilised.
- 7.7.32** The BT telephone exchange, from which some telecommunication cables/optical fibres are currently sourced, would be determined following a detailed investigation by the telecommunication network provider when an order is placed. At this stage BT has significant cables situated throughout the site, although currently to non-adoptable standards, and capacity to supply the number of lines that may be required.
- 7.7.33** Taking into account the presence of existing telecom ducting but the likelihood that the majority of sections of these ducts may need to be supplemented with new ducts dependant on the number and congestion of cables, condition and location, the impact of telecommunications work is considered to be short term, local and of negative negligible significance.
- 7.7.34** Within the site a combined multi-way duct bank may be provided but with multiple chambers to provide appropriate access and security. These duct routes would be located within the road/infrastructure corridors. The effect of telecommunications work within the site is considered to be negative negligible but would be long term since new supplies would be provided throughout the 10 year development period.
- 7.7.35** The operation of the new communication services within the site is also considered to have a positive negligible impact on existing and proposed services. No upgrade is required as we could use the existing facilities.

General

7.7.36 As phases of the proposed development are built out, the on-site utility network would be expanded to suit. This may require connection to existing services within earlier phases and could cause ongoing minor disturbance to the residents and users of the site. This would be managed as a normal part of phased development operations. The measures identified above for off-site works would also be appropriate for use on-site, in most circumstances.

Summary

7.7.37 Table U.02 below summarises the result of the assessment of impacts from the development on urban services.

Table U.02: Summary Table Of Impacts			
Impact	Summary Description	Duration of Impact	Significance of Impact
GENERAL			
Diverting existing utilities in local roads	To allow new road connections from site to tie into existing highway network	Medium term	Negative Minor
Providing new utility supplies from off site locations to the site	New supplies along existing road and footpaths could restrict tree planting and disrupt as a result of maintenance requirements	Long term	Negative Minor
Trenching through potentially contaminated ground	When excavating trenches on site for utilities there is a risk of encountering contaminated ground	Short to medium term	Negative Negligible
Use of imported granular fill	Bedding and surround material for installation of services on site	Medium term	Negative Negligible
POWER			
New power supplies to the site	Provision and quantum of new power supplies provides the potential for further enhancement to serve other developments	Long term	Positive Negligible
Upgrade of existing Sub-station on site (construction)	Sub-station upgraded in site boundary as part of 1st Major Phase	Short to Medium term	Positive Negligible

FOUL			
New foul water sewers (construction)	Additional/replacement/existing connections from the site to the Sewage Treatment Works in public roads	Short term	Negative Moderate
New foul flow discharges from the site	Increased foul flows within an overall combined flow not exceeding existing flows	Long term	Negative Negligible
Separation on site of storm and foul flows	Separate storm and foul sewers on the site provide future flexibility for separating flows off site thus reducing impact of foul sewer overflows	Long term	Positive Minor
WATER SUPPLY			
New water supply connection via Camp Road (construction)	1600m length of new 300mm diameter supply pipe to enter site via Camp Road to the east and connect through to Heyford Village	Medium term	Positive Moderate
Operation of new supplies	Enhancement of existing local network provides the opportunity for others	Long term	Positive Minor
Quantum of new potable supplies to the site	Limit new supplies and off site works required to those absolutely necessary and thereby ensure a sustainable approach to water supply	Long term	Positive Minor
GAS			
Relocation of gas mains (construction)	New gas mains to replace existing network and provide for new masterplan	Medium term	Negative Minor
Additional gas consumption as a result of development	Operation of new gas supplies to the site via new connections to the low pressure network	Medium Term	Negative Negligible
COMMUNICATIONS			
Limited reinforcement of the existing comms duct network off site (construction)	Laying new ducts along existing roads and footpaths	Short term	Negative Negligible

Installation of additional comms cables within the site along previously installed ducts (construction)	Lifting of chamber covers and providing additional comms cables	Short term	Negative Negligible
Operation of additional comms services to the site	Utilisation of existing capacity at the telephone exchanges	Long term	Positive Negligible
WASTE			
Disposal of municipal and commercial/industrial waste	Municipal waste would be collected and disposed of by the Cherwell District Council. Disposal of commercial/industrial waste would be the responsibility of individual occupiers and would be carried out by contractors.	Long term	Negative Negligible

7.8 OPPORTUNITIES FOR FURTHER MITIGATION MEASURES

General – Off-Site

- 7.8.1** For all utility services the most significant direct effects would be as a result of the off-site works. It is recommended that all new work, diversion works and reinforcement along the same road be coordinated, perhaps as part of a multi utility installation where appropriate, so that wherever possible the work would be carried out at the same time using common trenches, logically sequenced where trench sharing would not be feasible. Reducing the number of excavations would reduce the potential for accidental damage and interruptions to existing utilities.
- 7.8.2** A strategic review of all existing utilities by the respective utility companies may result in identification of opportunities for further upgrades or enhancements of utility supplies that would avoid future disruption along the proposed routes.
- 7.8.3** All utility companies could consider the use of economic alternatives where appropriate in order to mitigate the impact of the works proposed.

Power

- 7.8.4** Advanced technical solutions would be considered when providing new electrical infrastructure. These may further reduce any residual impact of providing new power supplies to the site. For example, cross-linked polyethylene cables are a relatively new form of extra high voltage cable construction that avoids the need for oil-cooled cables, which remove the risk of spillage or leaking of oil. Alternative renewable sources such as wind and solar energy could supplement or provide the required development needs. NOC will consider a

number of sustainable options including alternative energy supply. NOC will consider developing a renewable energy strategy.

- 7.8.5** The further expansion of the proposed on site sub-station would provide the opportunity for electricity distribution companies to invest in future capacity for new developments outside Heyford Park and for general load growth in the area. This would provide some long-term moderate benefit if spare capacity were available for other sites.
- 7.8.6** Designing buildings within the development to achieve the applicants' stated targets of reducing carbon emissions by as much as to 25% below those specified by the current Building Regulations (2000), following the Energy Hierarchy of applying energy efficiency, then renewable energy and then optimising efficiency of supply, would reduce the demand on the existing and new power supplies.

Potable Water

- 7.8.7** Thames Water Utilities could consider the option of relining pipes rather than installing new pipes to supply the site if appropriate. This is a potentially quicker method and reduces the need to open up trenches in existing roads.
- 7.8.8** Thames Water Utilities could consider the reduction in leakage from existing pipes off site as a more sustainable approach to generating additional capacity within their system in conjunction with expanding and increasing the network to supply the site.
- 7.8.9** The feasibility of integrating aspects of SUD's including rainwater harvesting and grey water recycling could be examined further by means of feasibility/viability studies at the detailed design stage for specific zones/plots, as they come forward, refer to Sustainability Statement for Surface Water Management Strategy.

Waste

- 7.8.10** Various mechanisms to reduce waste could be introduced including encouraging re-use, and making recovery of waste possible by providing easily accessible facilities for commercial and household recycling and composting.

Telecommunications

- 7.8.11** Managing the ducts can prevent repeated and unnecessary lifting of covers to remove or pull new communication lines. The role of managing and regulating the on-site duct network could be conducted by British Telecom maintenance team or a multi-utility Infrastructure Provider who will adopt and maintain the on-site utilities.

7.9 MONITORING

- 7.9.1** The impacts associated with the construction of on site utilities would be monitored in accordance with the techniques as specified in Chapter 8.

7.9.2 Off site works would be carried out by the relevant statutory undertakers, in accordance with the New Roads & Street Works Act (NRSWA) and following their own operating procedures.

7.10 REFERENCES

- i. Department for Environment, Food and Rural Affairs website, May 2003, Capital Waste Facts
- ii. Environmental Protection Act, 1990
- iii. Special Waste Regulations, 1996, SI972
- iv. The Building Regulations, 2000, SI253 I