The Great Grid Upgrade

North Humber to High Marnham

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North Humber to High Marnham

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1. Water Resources Assessment

1.1 Introduction

1.1.1 This appendix to **Application Document 6.11 Chapter 11 Water Environment** sets out the Water Resources Assessment (WRA) for the Project. The need for an assessment of the water demands of the Project was highlighted by Anglian Water, given that the Project is in a water stressed region. Due to the impacts of climate change and to help protect the environment, the amount of water that Anglian Water can abstract is reducing, which reduces the ability of the provider to be flexible with new requests to supply non-domestic connections.

1.1.2 To recognise this position, Anglian Water has adopted a 'Non-Domestic Water Requests Policy' (Anglian Water, 2026). As part of this Policy, all applicants for non-domestic water supplies to non-household developments must complete a WRA.

1.1.3 The WRA has been informed by engagement undertaken with Anglian Water and has been prepared with reference to Anglian Water guidance on the information expected to be included in a WRA.

1.1.4 This document summarises: the information used to inform the WRA; the measures that would be in place during construction of the Project with respect to water resources; and the WRA impact assessment and conclusions.

Water Resources Context

1.1.5 The Project would be located within the following Water Resource Zones[1] (WRZs):

- Lincolnshire, Retford and Gainsborough; and
- Yorkshire Water Grid Surface Water Zone (SWZ).

1.1.6 The majority of the region that the Project is proposed to be located within (Route Sections B-F) is designated by the Environment Agency as seriously water stressed. Route Section A is not located in a designated water stressed area.

1.1.7 The following plans have informed the WRA:

- Anglian Water's Water Resource Management Plan (WRMP) (Anglian Water, 2025);
- Water Resources East Regional Plan (Water Resources East, 2023); and
- Yorkshire Water WRMP (Yorkshire Water, 2025).

[1] A Water Resource Zone (WRZ) is a geographic area that represents the largest area a water company will supply with water

Consultation and Engagement

1.1.8 The statutory consultation feedback received from the Environment Agency and Anglian Water has been summarised in Table 11.5 of **Application Document 6.11 Chapter 11 Water Environment**. Several subsequent meetings have been held with Anglian Water to discuss matters relating to the WRA.

1.1.9 The content of the WRA reflects the Project's design maturity at application for development consent. A formal application for a water supply has not yet been submitted by the Applicant through Anglian Water's Inflow Portal.

1.1.10 It is expected that, post DCO consent, as the Project progresses into detailed design, additional information would become available regarding the water use profile of the Project. It is therefore proposed that collaboration between the appointed Main Works Contractor(s) and Anglian Water will continue, and further information will be shared with Anglian Water as required when available. This is secured through commitment W15 within **Application Document 7.3 Register of Environmental Actions and Commitments**.

2. Water Uses

2.1 Introduction

2.1.1 This WRA focuses on the construction stage of the Project. Given the nature of the proposals, there would be no water use demand during operation (and maintenance), so this has been screened out and is not considered further.

2.1.2 Construction activities would begin with the preparation and installation of temporary construction compounds. The construction compounds would be established along the route of the proposed overhead line and would be expected to be in use for approximately 4 years. The locations of the compounds are shown on **Application Document 6.4.F3 Figure 4.3 Temporary Construction Works,** with a total of three main works compounds proposed. Smaller satellite compounds would also be required at intervening locations along the route between the main construction compounds to ensure provision of welfare, storage, and mess room facilities for site operatives. A total of six satellite compounds are proposed.

2.1.3 Water requirements during construction of the Project would vary throughout the construction programme, depending on the activities being undertaken. Due to the linear nature of the Project, construction activities would be transient over the length of the proposed overhead line.

2.1.4 Water consumption estimates have been set out in the following section in relation to four major activities associated with the construction of the Project, namely: wheel washing; suppressing dust; road sweeping; and supply of compound welfare requirements.

2.1.5 An indicative construction programme is outlined in **Application Document 6.4 Description of the Project.** For the purposes of this assessment it has been assumed that water would be required to support these uses during the enabling, construction and reinstatement periods, which would span a period from quarter 2 of 2028 to quarter 2 of 2033.

2.2 Non-Domestic Water Consumption

2.2.1 In accordance with commitment GG20 of **Application Document 7.3 Register of Environmental Actions and Commitments** wheel washing of construction vehicles would be required to minimise debris brought onto public roads. While wheel wash systems often have high pump rates, much of this water is recycled and it is intended for any losses to be replenished using a water bowser, meaning an external water supply supported by an abstraction from a local water resource, would not be required.

2.2.2 The following assumptions were applied in the calculation process for wheel washing. These assumptions were based on historical data from other similar National Grid projects, and are as follows:

- Each of the 3 main compounds to have 2 No wheel washes (6-wheel washes in total);

- Each of the 6 satellite compounds to have 1 No wheel washes (6-wheel washes in total); and
- Consumption rate of 4.8m^3/day (per wheel wash)

2.2.3 Wheel wash consumption for each compound was then calculated by multiplying the number of wheel washes by the assumed wheel wash consumption rate. A total daily consumption for this activity across all compounds is equal to 57.6m^3/day.

2.2.4 As per GG20 of **Application Document 7.3 Register of Environmental Actions and Commitments,** road sweeping would be required to minimise dust and debris build-up along site access roads. Construction sites require specialised road sweeper equipment capable of handling heavy debris, concrete fragments, and other challenging materials that standard cleaning equipment cannot manage effectively.

2.2.5 The following assumptions were applied in the calculation process for road sweeping water consumption:

- A total of 10 road sweepers would be required operating largely from the compounds; and
- Consumption rate of 10.8 m^3/day per road sweeper.

2.2.6 Table 2.1 shows the consumption rate and duration of these activities at a typical main compound.

Table 2.1 – Estimated wheel washing and road sweeping water demand at a typical main compound

Activity	Start	End	Duration (weeks)	Consumption (m3/day)
Wheel washing	Q2 2028	Q2 2033	274	9.6
Road sweeping	Q2 2028	Q2 2033	274	10.8

2.2.7 As per commitment GG21 in **Application Document 7.3 Register of Environmental Actions and Commitments** earthworks and stockpiled soil will be protected by using water suppression where appropriate.

2.2.8 Water for this activity would be stored in bowsers situated at both main and satellite compounds. The following assumptions were applied in the calculation process for dust suppression. These assumptions were based on historical data from other similar National Grid projects, and are as follows:

- Main compounds to be served by 3 No. bowsers;
- Satellite compounds to be served by 2 No. bowsers;
- Each bowser has a capacity of 5,000 litres (5m^3).

2.2.9 Water demand for this activity is expected to vary throughout the seasons, with a peak demand per day at a main compound of approximately 15m^3/day.

2.3 Domestic Water Consumption

2.3.1 The following sections summarise expected daily water consumption requirements for the main and satellite compounds. It is proposed that these needs would be met from mains water supplies, or where mains water connections are not practicable, water would be supplied by tanker.

Main Compounds

2.3.2 The expected daily potable water requirements of the main compounds have been calculated with reference to British Standard (BS) 8542:2011 (British Standards Institute, 2011), the code of practice for calculating domestic water consumption in non-domestic buildings. Four sources of demand have been considered: Water Closets (WCs), including both flushing toilets and urinals, taps, basins and showers, dishwashers and drinking water, assuming 12 operating hours a day. Table 2.2 provides a summary of domestic water consumption associated with each source of water use.

Table 2.2 – Estimated typical domestic water consumption by usage

Water usage	Consumption (l/person/day)
WCs	32.0
Wash Basins & Showers	16.0
Kitchen Taps	7.0
Dishwashers	1.0
Drinking Water	2.5
Total	**58.5**

2.3.3 The data presented above was used as the basis for determining the anticipated total water usage associated with each domestic activity for the compounds. The following assumptions were applied in the calculation process:

- Satellite and main compounds would accommodate 5 gangs of 8 workers, plus admin and site staff;
- A working week consists of 7 days; and
- A working day consists of 12 hours.

2.3.4 Based on these assumptions, estimations of total domestic water consumption at a main construction compound has been calculated and summarised in Table 2.3.

Table 2.3 – Estimated Main Compound Domestic Water Consumption for a Typical Main Compound

Activity	Start	End	Workforce (people)	Consumption (m^3/day)
Main compound domestic water consumption	Q2 2028	Q2 2033	40	2.34

2.3.5 Across all nine compounds a domestic water supply demand of approximately 21m^3/day would therefore be generated during the construction period, which would span 274 weeks.

2.3.6 The main works compounds may include grey water harvesting for use in toilet flushing, reducing the water consumption associated with this domestic usage.

Discharges

2.3.7 Management of surface water runoff during construction is addressed in **Application Document 7.13 Flood Risk Assessment,** Appendix B Framework Construction Surface Water Management Plan (CSWMP).

2.3.8 Wastewater generated during construction would be treated on site with occasional desludging tankered away for disposal. No discharge to sewers is proposed.

3. Water Efficiency Measures

3.1 Water Efficiency

3.1.1 The following water efficiency measures are proposed to be adopted during construction, as secured by commitment W19 in **Application Document 7.3 Register of Environmental Actions and Commitments**:

- Educating the workforce on the importance of saving water to help maximise the benefits of any practical measures that are put in place, e.g. via toolbox talks, appointing a champion;
- The main works compounds may include grey water harvesting for use in toilet flushing, reducing the water consumption associated with this domestic usage;
- Installing water meters to monitor how much water is being used;
- Using leak detection systems (where possible) or undertaking regular inspections to detect leaks;
- Using water-saving devices such as aerated taps and waterless urinals in construction site offices/welfare facilities;
- Using hoses with triggers to prevent water wastage;
- Implementing water conservation measures at construction compounds, which may include water from attenuation basins being pumped into a bowser and used to damp down haul roads, soil stockpiles and site compounds to prevent the generation of dust; and
- Considering the Water Management Hierarchy when making construction decisions, prioritise eliminating the use of water (e.g. alternative for wheel washing) and attempting to reduce disposal as much as possible.

4. Water Resources Impact Assessment

4.1.1 This section of the WRA summarises the impact assessment for the Project during its construction. The impact assessment has taken account of the baseline water environment, the water supply needs of the Project and the measures/commitments that would be in place, and which are documented in **Application Document 7.2 Outline Code of Construction Practice** and **Application Document 7.3 Register of Environmental Actions and Commitments**.

4.1.2 The following sections firstly address the potential impacts of the Project on physical water supply infrastructure and the safeguards that would be in place to protect the quantity and quality of existing water interests. It then addresses potential impacts associated with supplying the water demands of the Project, followed by potential cumulative impacts. The source-pathway-receptor principle has been applied.

4.2 Potential Impacts on Physical Water Supply Infrastructure and Existing Water Interests

Potential Impacts on Water Supply Infrastructure

4.2.1 As per commitment W07 in **Application Document 7.3 Register of Environmental Actions and Commitments**, active private water supplies would be identified and where any potential risks are identified, appropriate mitigation measures would be implemented during construction.

4.2.2 Commitment W07 describes the measures that would be in place to protect private water supplies. This commitment outlines that should the works have potential to cause any issue to private water supply, National Grid would agree with the landowner appropriate remediation, which may include providing an alternative water supply if appropriate.

Potential Impacts on Quality and Quantity

4.2.3 It is possible that the Project could impact existing water interests through pollution and activities that could degrade water quality. Such activities include but are not limited to creation of new watercourse crossings for temporary construction access, and localised dewatering of excavations. **Application Document 6.11 Chapter 11 Water Environment** reports the assessment of potential impacts on water quality with respect to surface water whilst potential impacts on groundwater quality are assessed in **Application Document 6.12 Chapter 12 Geology and Hydrogeology**. These chapters conclude that, with the mitigation measures in place, no significant effects on water quality are anticipated during construction and operation. Therefore, no impacts on existing water interests are anticipated through this pathway with the mitigation measures in place.

4.2.4 Consideration has also been given to the potential for the Project to impact existing water interests by altering flow regimes and through negative impacts on the quantitative attributes of groundwater resources. **Application Document 6.11 Chapter 11 Water Environment** and **Application Document 6.12 Chapter 12**

Geology and Hydrogeology chapters conclude that, with mitigation measures in place, there would be no significant effects on these aspects of the water environment. Hence no impacts on existing water interests are anticipated through this pathway.

4.2.5 **Application Document 6.11 Chapter 11 Water Environment** and **Application Document 6.12 Chapter 12 Geology and Hydrogeology** describe the safeguards that would be in place to protect the quality and quantity of existing water resources. Framework Construction Surface Water Management Plan (CSWMP) as Appendix B to **Application Document 7.13 Flood Risk Assessment** provides further detail on the proposals for management of runoff and foul water during construction of the Project.

4.2.6 Commitment GH12 within **Application Document 7.3 Register of Environmental Actions and Commitments** outlines restrictions on work with Source Protection Zones.

Potential Impacts Associated with Supplying the Water Demands of the Projects

4.2.7 Consideration has been given to potential impacts associated with supplying the water demands of the Project. Consultation with Anglian Water has begun at an early stage in the development of the Project to ensure that the demands can be factored into Anglian Water's planning and strategies.

4.2.8 The Project does not include any new abstractions from local surface water or groundwater resources and would incorporate water use efficiency measures to reduce water demand, where practicable.

5. Conclusion

5.1.1 This document has presented the WRA that has been undertaken for the Project.

5.1.2 Estimates have been provided for water consumption during construction of the Project based on design maturity achieved at the point of submission of the application for development consent. The water demand during the construction phase is temporary in nature, associated with welfare and site activities and would be concentrated during the main build period. The water efficiency measures that are proposed have also been outlined. The Project would have has no discernible water demand during its operation (and maintenance).

5.1.3 The WRA refers to the mitigation measures/commitments that would be in place and **Application Document 7.3 Register of Environmental Actions and Commitments**, in which these measures are documented. These include measures to minimise impacts on existing water supplies, to protect the quality and quantity of existing water resources and safeguard the water environment.

5.1.4 The impact assessment addresses the potential impacts of the Projects on physical water supply infrastructure and potential impacts associated with supplying the water demands of the Project. With mitigation measures in place, no significant adverse effects on water resources are anticipated.

5.1.5 As the Projects progress into detailed design, it is anticipated that collaboration with Anglian Water will continue regarding water supply, with further information to be shared with Anglian Water as required when available (commitment W15 in **Application Document 7.3 Register of Environmental Actions and Commitments)**.

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National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com