Light Valley Solar

Water Resource Assessment

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Version 2

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Light Valley
Solar

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and Procedure) Regulations 2009

Light Valley Solar

DCO Submission

Water Resource Assessment

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1 Introduction

1.1 Background

1.1.1 Light Valley Solar Limited (the 'Applicant') is bringing forward a proposed solar and energy storage development located near Selby. The Proposed Development is considered to be a Nationally Significant Infrastructure Project (NSIP). In response to regulatory guidance and consultation feedback from the Environment Agency (EA), a Water Resources Assessment is required to evaluate the Proposed Development's anticipated water demand and identify feasible sources of supply during both the construction and operational phases. Extracts of the relevant PEIR consultation feedback are given in Annex A.

1.1.2 Water demand during decommissioning is expected to be lower than during construction and so has not been considered separately at this stage. Decommissioning typically involves dismantling and removal activities that require less water than construction, and includes processes such as dust suppression, and equipment cleaning. At this early stage, it is not possible to provide robust estimates for decommissioning water demand, as the process, technology, and regulatory requirements may change significantly over the operational life of the development. Should decommissioning require significant water use, this will be assessed in detail at the appropriate time and appropriate measures included in the detailed Decommissioning Environmental Management Plan (DEMP(s)), as relevant, in line with prevailing guidance and regulatory requirements.

1.2 Scope of work

1.2.1 This Water Resources Assessment sets out to:

1) Estimate water demand for the Proposed Development during construction and operation, including key activities such as amenity use, equipment and vehicle washing, horizontal directional drilling, dust suppression, ~~and~~ solar module cleaning and replacement activities.
2) Identify and evaluate potential water supply options, including mains water, groundwater abstraction, surface water abstraction, surface water runoff reuse, and water tankering.
3) Assess the feasibility of each supply option in the context of regulatory constraints, site-specific conditions, and the current stage of design.
4) Provide recommendations for further engagement, refinement of water demand estimates, and next steps to support the Environmental Statement (ES) and future project planning.

1.2.2 All water demand figures presented are indicative and based on conservative assumptions. These will be refined as the design progresses and more detailed information becomes available.

2 Site information

2.1.1 The Proposed Development comprises a solar photovoltaic (PV) electricity generating station of over 100 megawatts (MW) and 'associated development' comprising a Battery Energy Storage System (BESS), grid connection infrastructure and other infrastructure integral to the construction, operation and maintenance, and decommissioning phases.

2.1.2 The main element of the Proposed Development comprises seven Solar Development Sites (approximately 900 ha), as listed below and shown in Plate 2-1 (note that a previously proposed Solar Development Site 5 has been excluded from the Proposed Development).

1) Solar Development Site 1 (344.8 ha);
2) Solar Development Site 2 (83.3 ha);
3) Solar Development Site 3 (19.9 ha);
4) Solar Development Site 4 (283.8 ha);
5) Solar Development Site 6 (99.6 ha);
6) Solar Development Site 7 (8.7 ha); and
7) Solar Development Site 8 (60.0 ha).

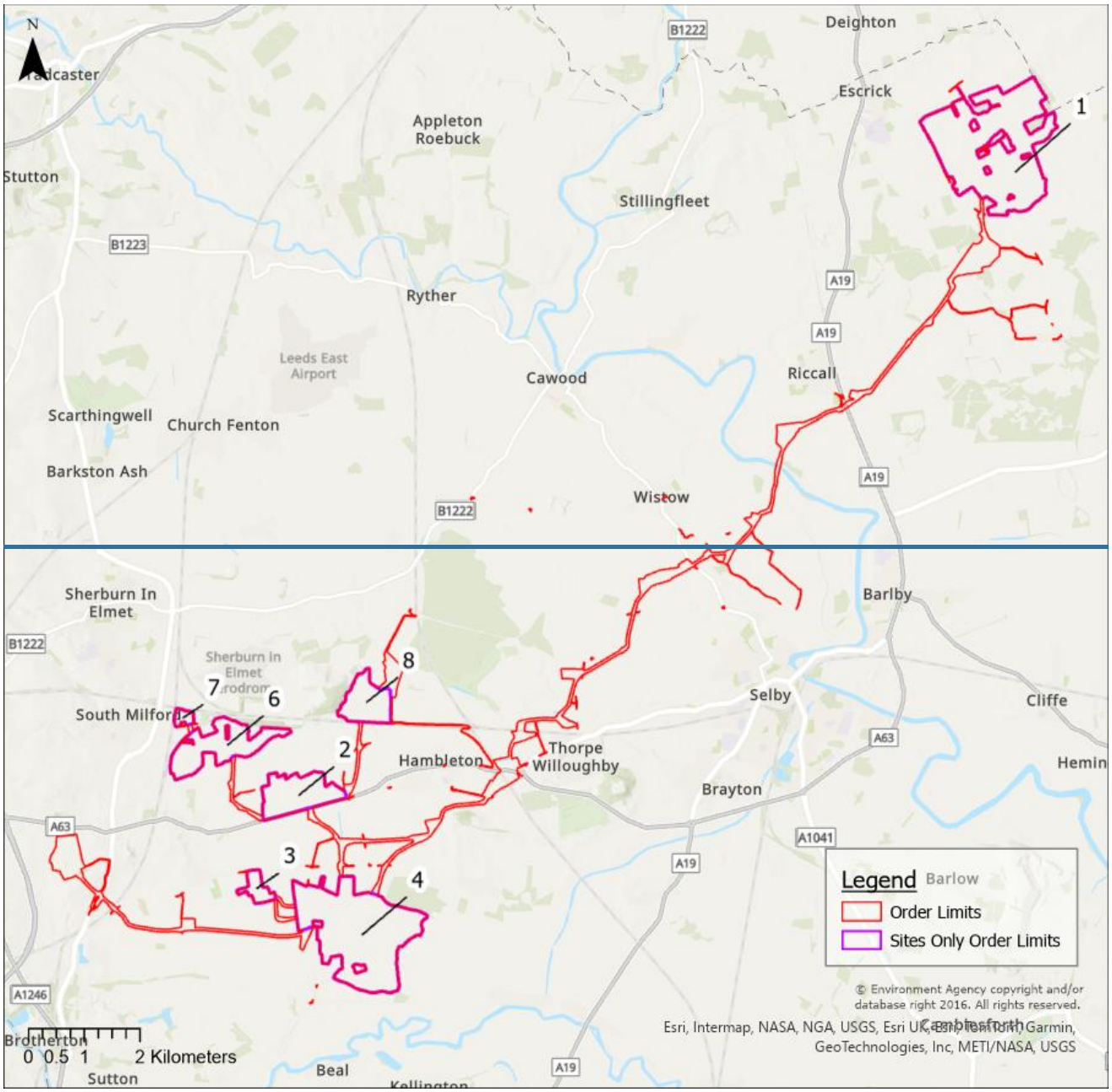
2.1.3 A BESS compound will be located on Solar Development Site 2, and electrical substations are included in the Proposed Development.

2.1.4 The Cable Route Corridor is the area within which the export connection cables (hereafter referred to as the 'Grid Connection Cables') would be located to connect the Solar PV Sites to the National Grid at the existing Monk Fryston Substation (hereafter referred to as the 'Existing National Grid Monk Fryston Substation') and the area within which cables connecting the Solar Development Sites would be located (hereafter referred to as 'Interconnecting Cables') (refer to Figure 2-1: Illustrative Site Layout Plan (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**].

2.1.5 Further details of the Proposed Development are presented in Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**] and the design envelope for the Proposed Development is set out in the Design Parameters and Commitments Document [**EN0110012/APP/LVS/05.06**] and the limits of deviation shown on the Works Plans [**EN0110012/APP/LVS/02.03**].

2.1.6 It is estimated that the construction of the Proposed Development would require 24-36 months in total, starting in 2028 at the earliest. The operational phase of the Proposed Development is proposed to be up to 60 years.

Plate 2-1 Site layout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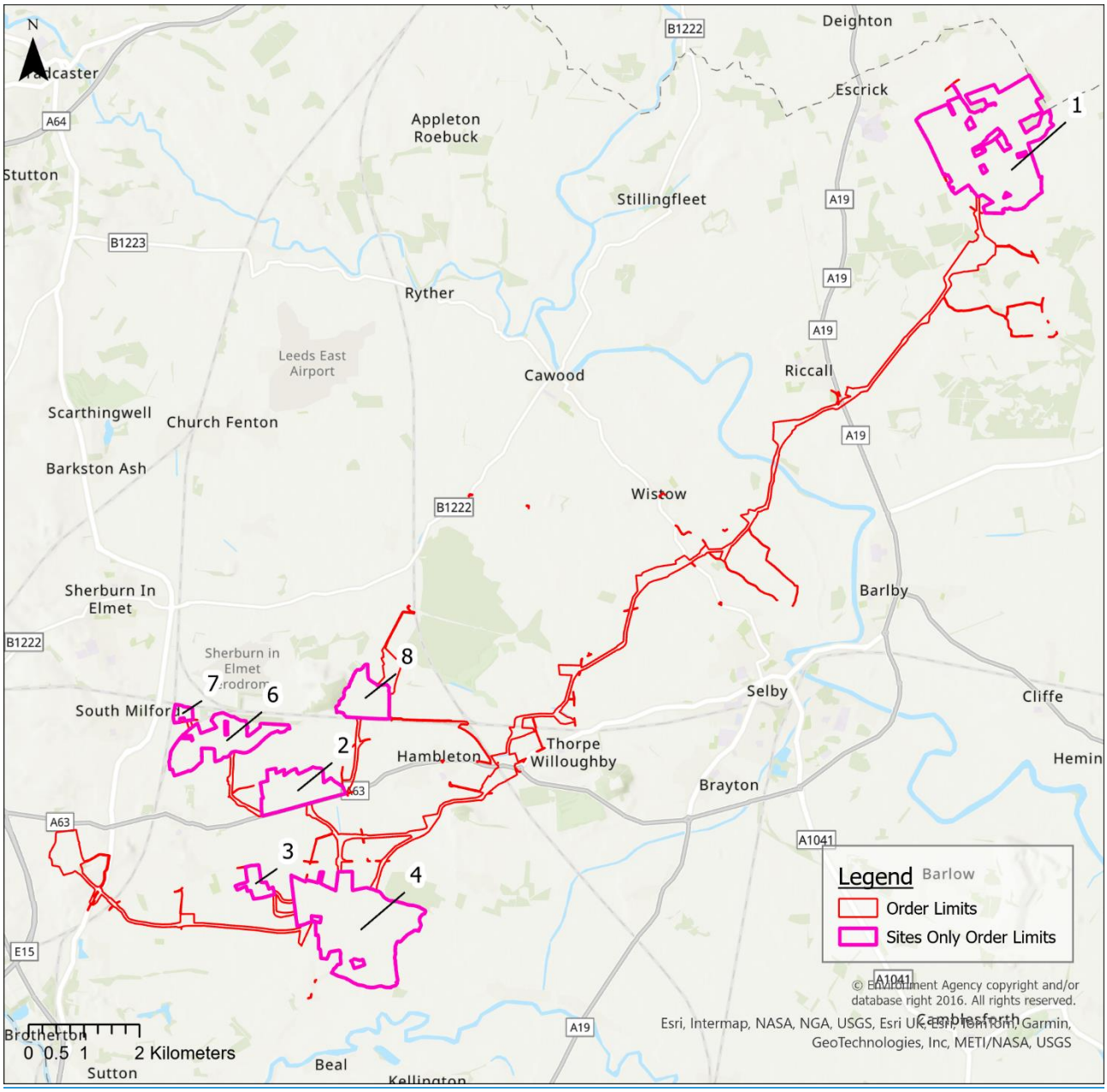
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3 Water demand

3.1 Areas of water demand

3.1.1 Water requirements for the Proposed Development can be categorised into those that arise during the construction phase and those that occur during the operational phase. Each identified demand for both phases is outlined below.

Construction phase:

1) Amenity water use for construction staff;
2) Vehicle washing water;
3) Equipment cleaning water;
4) Directional drilling water; and
5) Dust suppression.

Operational phase:

1) Amenity water use for operational staff; ~~and~~
2) Module cleaning water; and~~.~~
~~2)~~3) Replacement activities.

3.1.2 Water demand during decommissioning is expected to be lower than during construction and so has not been considered separately.

3.1.3 This section presents quantified estimates of areas of demand for the Proposed Development. As planning is at an early stage and the design has not yet been finalised, multiple estimation approaches have been utilised; figures should therefore be considered indicative. The water demand estimates are based on assumptions specified in Annex B. The purpose of this document is to assess the general feasibility of water supply rather than to detail specific implementation steps.

3.1.4 For water demand calculations, a construction period of 2.5 years has been assumed, representing the mid-point of the estimated 2 to 3 year construction period (see Chapter 1 – 4 (ES Volume 1) [**EN0110012/APP/LVS/06.01[01-04]**]. This duration is applied differently depending on the calculation: for activities based on total quantities (e.g. vehicle washing), a shorter duration gives a worst-case daily demand, while for activities calculated per day and summed over the period (e.g. amenity water), a longer duration gives a worst-case total demand. Therefore, a construction period of 2.5 years has been applied to provide a balanced basis for estimating water requirements.

3.1.5 It is noted that within the EA PEIR consultation feedback (Annex A) BESS cooling was noted as a potential water demand. BESS may employ air, liquid, or refrigerant-based cooling systems, with water usage varying depending on the configuration. Typically, BESS cooling utilises sealed, closed-loop liquid cooling

systems, which requires minimal water input. However, some systems may use a mix of cooling methods, including non-traditional liquid circulation, and are not consistently closed-loop.

3.1.6 For the purposes of this assessment, it is assumed that the BESS cooling systems implemented will be closed-loop and therefore will not result in significant consumptive water use.

3.1.7 It is understood that concrete used during construction will be delivered to site as ready-mixed product. As such, it does not require additional water for mixing on site and therefore does not contribute to construction-phase water demand.

~~3.1.8~~ The water required to fill external firefighting water storage tanks has been excluded from the demand calculations in this report as the water demand is not on a per day/year basis during operation but would be only required in the event of an emergency response incident. The BESS Compound will contain a minimum of two firefighting water storage units of no less than 230,000 litres in capacity, capable of delivering 1900 litres per minute for 4 hours (exceeding NFCC guidance which sets a minimum duration of two hours, equivalent to a reference firewater volume of 228 m³).

~~3.1.9~~3.1.8 ~~Replacement activities during the operational phase are not expected to result in significant water demand and have therefore not been considered in this assessment. This is because no intrusive groundworks are anticipated, meaning activities such as dust suppression will not be required. Water use is expected to be limited to minor tasks such as wheel washing during equipment deliveries, which would be negligible compared to construction phase demand.~~

3.2 Amenity water use for construction staff

3.2.1 Amenity water use refers to the provision of drinking water, handwashing facilities, and sanitation. The code of practice for provision and management of temporary water supplies and distribution networks, BS 8551:2015 (Ref 4), states that an open industrial site, such as construction sites without a canteen, has an estimated daily amenity water demand of 60 litres per person (0.06 m³/person/day). This figure is used in assessments to provide a conservative estimate of water consumption. Actual usage may be reduced by implementing measures such as non-flushing chemical toilets.

3.2.2 It is estimated that the maximum number of construction staff working during the day will be 770 at the seven Solar Development Sites, with approximately 120 construction workers along the Cable Route Corridor, resulting in a total peak workforce of approximately 890. The average workforce is expected to be 385 construction staff on the Solar Development Sites and 120 along the Cable Route Corridors, giving an average construction workforce of 505. Construction activities are likely to be carried out Monday to Friday 07:00 to 18:00 and between 08:00 and 13:30 on Saturdays, totalling 278 annual working days during construction. Table 3-1 estimates construction staff amenity water use based on these figures.

Table 3-1 Amenity water use for construction staff

Category	Value	Unit
Construction staff water use (Ref 4)	0.06	m^3/employee/day
Peak construction staff employee numbers	890	employees
Peak amenity water use for construction staff	**53.4**	**m^3/day**
Average construction staff employee numbers	505	employees
Average amenity water use for construction staff	**30.3**	**m^3/day**
Annual workdays*	278	days
Annual water use	8,423	m^3/year
Construction phase duration*	2.5	years
Total amenity use for construction staff	**21,059**	**m^3**
See Chapter 1 – 4 (ES Volume 1) [EN0110012/APP/LVS/06.01[01-04]**]*		

3.3 Vehicle washing water

3.3.1 Wheel wash facilities will be available for Heavy Goods Vehicles (HGVs) leaving the site to reduce mud or debris on local roads. Estimated HGV movements throughout the Solar Development Sites' construction phase are provided in Appendix 14.1: Transport Assessment (ES Volume 3) **[EN0110012/APP/LVS/06.03.14.01]**. Table 3-2 uses these figures to estimate water usage for vehicle washing during construction.

Table 3-2 Vehicle washing water

Category	Value	Unit
Total vehicle movements	63,199	per construction period
Total precipitation days[1] (Ref 13)	116	per year
Proportion of precipitation days	31.75%	
Vehicle movements on precipitation days	20,066	per construction period
Vehicle wheel wash water use (Ref 3)	0.15	m^3/vehicle
Total vehicle washing water use in construction phase	**3,010**	**m^3**
Annual workdays*	278	
Construction phase duration*	2.5	years
Average vehicle washing water use in construction phase	**4.3**	**m^3/day**
Peak daily vehicle movements	161	
Peak vehicle washing water use in construction phase	**24.2**	**m^3/day**
See Chapter 1 – 4 (ES Volume 1) [EN0110012/APP/LVS/06.01[01-04]**]*		

[1] Total precipitation days have been estimated based on Met Office long-term averages for Church Fenton weather station, located at Leeds East Airport, located approximately 4km from the Proposed Development.

3.4 Equipment cleaning water

3.4.1 Equipment cleaning consists of washing both fixed and portable equipment during the construction phase. Due to expected variation, only an indicative estimate can be provided at this stage, based on anticipated cleaning flows and durations. The equipment cleaning water demand estimate is based on a typical hose flow rate of 1.5 m³/hr, consistent with manufacturer data (Ref 10) and engineering guidance for industrial hoses used on construction sites (Ref 4). An average daily cleaning duration of 0.25 hours per cleaning station has been applied, reflecting industry practice for periodic equipment cleaning (Ref 11). These assumptions are intended to provide a conservative estimate in the absence of detailed data from operating solar plants and will be refined as more site-specific information becomes available. A peaking factor of 3 has been applied to account for periods of higher activity during peak construction. It is assumed that a cleaning station will be located in each of the seven Solar Development Sites and within the Cable Route Corridors. Table 3-3 outlines the calculations.

Table 3-3 Equipment cleaning water

Category	Value	Unit
Number of work areas	8	-
Hose flow rate	1.5	m^3/hr
Average daily cleaning time	0.25	hours
Average construction phase equipment cleaning water	**3.0**	**m^3/day**
Annual workdays*	278	-
Construction phase duration*	2.5	years
Total construction phase equipment washing water use	**2,085**	**m^3**
Peaking factor during peak construction	3	-
Peak construction phase equipment cleaning water	**9.0**	**m^3/day**
See Chapter 1 – 4 (ES Volume 1) [EN0110012/APP/LVS/06.01[01-04]**]*		

3.5 Directional drilling water

3.5.1 Trenchless solutions, for example HDD is proposed for the crossing of the River Ouse, main rivers, Internal Drainage Board (IDB) watercourses, and Water Environment Regulations (WER) water body line watercourses. Trenchless solutions will also be utilised when/if crossing ditches that lead to the following designated sites: Common Wood Site of Importance for Nature Conservation (SINC), Nightingale Wood SINC, Burr Closes Site of Special Scientific Interest (SSSI), and Barber Rain SINC. Trenchless solutions will also be employed to pass beneath Ouse Bank-Westfield-Ricall Ings SINC that flanks the river Ouse, which will avoid direct impacts to the designated site. Trenchless solutions would also be used for railway crossings. Road crossings will be a combination of

trenchless and open cut crossings (see Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**].

3.5.2 Water is used during HDD, functioning to remove excavated material and cool the drilling equipment. The estimation of water consumption during directional drilling is directly related to the volume of earth extracted. Typically, around 2.5 m^3 of water is required per m^3 of earth removed however, in clay-rich soils, water usage can increase to 5m^3 per 1m^3 of earth extracted (Ref 5). This site is covered by a mixture of sandy, loamy soils and clayey soils (Ref 12). Therefore, a conservative estimate of 4 m^3 of water per 1 m^3 of earth has been adopted for calculation purposes.

3.5.3 Peak daily water usage for HDD is estimated based on the assumption that up to 170 m of drilling can be completed in a single day (Ref 14), with no further HDD activities occurring during that period. For the purposes of estimating directional drilling water demand, a HDD construction phase duration of 229.5 working days has been applied, reflecting the anticipated programme for these activities across the full Cable Route Corridor. It is expected that two HDD teams will be operating throughout this period, occasionally working concurrently. The calculated average water demand for directional drilling represents an overall mean across the 229.5 day period; however, water usage will likely increase when both teams are active simultaneously and decrease when only one team is operating.

3.5.4 These estimates are based on preliminary horizontal directional drilling (HDD) route and configuration assumptions (as of October 2025), including that three parallel drill runs are completed per HDD location. These assumptions are subject to change as the design progresses. Final water demand will need to be revisited once detailed trenchless crossing locations and construction sequencing are confirmed.

Table 3-4 Directional drilling water

Category	Value	Unit
Number of locations directionally drilled (3 drill runs per location)	45	
Total drilled length	7,338	m
Diameter of drills	0.45	m
Volume of earth removed	1,167	m^3
Fluid ratio (Ref 5)	4	
Total construction phase directional drilling water	**4,668**	**m^3**
HDD construction phase duration*	229.5	days
Average construction phase directional drilling water	**20.3**	**m^3/day**
Maximum length for one directional drill location	170	m
Maximum volume of Earth removed for one directional drill	27	m^3
Peak construction phase directional drilling water	**108.1**	**m^3/day**
See Chapter 1 – 4 (ES Volume 1) **[EN0110012/APP/LVS/06.01[01-04]*		

3.6 Dust suppression

3.6.1 Dust suppression may be required during the construction phase of the Proposed Development, particularly during dry weather conditions. Activities such as earthworks, vehicle movements on unpaved haul roads, and material handling can generate dust, which may impact air quality, nearby receptors, and ecological features. To mitigate this, water is typically applied using mobile bowsers or misting systems across exposed surfaces and haul routes. In addition, works can be managed to control the extent of areas of open ground, thereby reducing the potential for dust generation.

3.6.2 Due to the wet climate in the area and the dispersed nature of the Light Valley Solar site, dust suppression is only expected to be required in limited circumstances, primarily when construction activities occur near sensitive receptors (such as residential properties or ecological sites). The exact amount of water required for dust suppression is highly variable and cannot be accurately calculated at this stage, as it depends on weather conditions, construction phasing, and the proximity of works to receptors.

3.6.3 To provide a conservative evaluation, a 10% uplift has been applied to the overall construction water demand to account for dust suppression, see Section 3.9.

3.7 Amenity water use for operational staff

3.7.1 As in the construction phase, operational amenity water refers to the provision of drinking water, handwashing facilities, and sanitation. Welfare facilities will be provided at the substations. An estimated daily amenity water demand of 60 litres per person (0.06 m^3/person/day) (Ref 4), consistent with the construction phase, has been applied.

3.7.2 No on-site staff will be required to operate the Proposed Development but there will be limited staff facilities located in the control rooms. It is anticipated that site visits will occur five times per month, with two staff members assigned to each visit. Staff requirements are not expected to exceed this, therefore peak operational staff numbers is consistent with average operational staff numbers.

3.7.3 Table 3-5 estimates construction staff amenity water use based on these figures.

Table 3-5 Amenity water use for operational staff

Category	Value	Unit
Operational staff water use (Ref 4)	0.06	m^3/employee/day
Operational staff water use per visit	0.12	m^3/day
Visits per year	60	days
Total operational phase amenity water use	**7**	**m^3/year**
Average amenity water use for operational staff	**0.02**	**m^3/day**
Peak amenity water use for operational staff	**0.02**	**m^3/day**

3.8 Solar module cleaning water

3.8.1 Periodic cleaning of the solar modules is required to maintain the effectiveness and energy generation efficiency. The cleaning frequency has yet to be determined. For this assessment, it is assumed that cleaning will occur once per year over a one-month interval.

3.8.2 The exact number of solar modules is not currently known and will depend on a range of factors including the size of the system, the type of technology (fixed or tracking), its location and the direction in which the panels are installed (see Chapter 1 – 4 (ES Volume 1) [**EN0110012/APP/LVS/06.01[01-04]**]). A conservative estimate of 920,000 solar modules has been used within this assessment however it is noted that this figure is likely to be revised down as design progresses.

3.8.3 Table 3-6 outlines the anticipated water requirements for the cleaning process.

3.8.4 For a conservative estimate of total water demand for the Proposed Development, these cleaning requirements are included in the overall calculations. In practice, module cleaning contractors may supply their own mobile water bowsers for the task.

Table 3-6 Solar module cleaning water

Category	Value	Unit
Number of solar modules	920,000	
Surface area per solar module	2.7	m^2
Total surface area of solar modules	2,484,000	m^2
Cleaning water requirements for solar modules (Ref 15)	0.00027	m^3/m^2/year
Total operational phase module cleaning water	**671**	**m^3/year**
Annual workdays	252	
Average operational phase module cleaning water	**2.66**	**m^3/day**
Module cleaning workdays per year	20	
Peak operational phase module cleaning water	**33.5**	**m^3/day**

3.9 Replacement activities

3.9.1 During the anticipated 60-year operational life of the Proposed Development, periodic replacement of infrastructure is expected to be required to maintain operational performance. Components requiring replacement include:

1) Solar PV panels (assumed to be replaced once during operational life)
2) BESS infrastructure (assumed to be replaced up to five times during operational life)
3) Transformers (assumed to be replaced once during operational life)

3.9.2 Components such as Solar PV mounting structures, cabling and substations are not anticipated to require replacement during operation.

3.9.3 It is not expected that an extensive replacement of all components will be required across the entirety of the Proposed Development during one period; instead, the programme for replacement of equipment across the Proposed Development is anticipated to be staged to maintain the electrical export to the National Grid.

3.9.4 The ES does not define the duration of the overall replacement programme. Solar PV panel replacement is anticipated to occur over a maximum 12 to 24 month period. However, replacement activities are expected to be undertaken on an ad hoc and phased basis throughout the 60-year operational life of the Proposed Development. For the purposes of estimating total replacement water demand, a conservative assumption has been made that replacement activities are equivalent to a cumulative two-year programme (504 workdays) over the operational life of the Proposed Development.

3.9.5 Water demand associated with replacement activities has been assumed to derive from workforce welfare requirements, wheel washing and equipment cleaning. No separate allowance has been made for dust suppression during replacement activities as replacement works do not involve intrusive groundworks and are anticipated to be less intensive than construction activities.

3.9.6 It is assumed that replacement activities could require up to 541 workers during peak periods, with an average workforce of 188 Full Time Equivalent (FTE) employees across the replacement programme. Table 3-7~~Table 3-7~~ outlines the anticipated water requirements for amenity water during replacement activities.

Table 3-7 Replacement activities amenity water

Category	Value	Unit
Replacement staff water use (Ref 4)	0.06	m^3/employee /day
Peak replacement staff employee numbers*	541	employees
Peak amenity water use for replacement staff	**32.46**	**m^3/day**
Average replacement staff employee numbers*	188	employees
Average amenity water use for replacement staff during replacement activities	**11.28**	**m^3/day**
Total workdays across replacement activities	504	days
Total amenity use for replacement staff	**5,685**	**m^3**
See Chapter 1 – 4 (ES Volume 1) [EN0110012/APP/LVS/06.01[01-04]***]		

3.9.7 Any replacement traffic is expected to result in fewer vehicle trips compared to traffic associated with the construction period as cable route corridor works would not form part of the replacement programme and replacement activities are anticipated to be less intensive than construction. It has been conservatively assumed for the purposes of this assessment that replacement activities across the lifetime of the project would generate vehicle movements equivalent to the non-cable construction traffic, resulting in an estimated 10,599 vehicle movements over the replacement programme across the lifetime of the project, with a peak of 41 vehicle movements per day. Table 3-8~~Table 3-8~~ outlines the

anticipated water requirements for vehicle washing water during replacement activities.

Table 3-8 Replacement vehicle washing water

Category	Value	Unit
Total vehicle movements*	10,599	
Total precipitation days[2] (Ref 13)	116	per year
Proportion of precipitation days	31.75%	-
Vehicle movements on precipitation days	3,365	
Vehicle wheel wash water use (Ref 3)	0.15	m^3/vehicle
Total vehicle washing water use in replacement	**505**	**m^3**
Total workdays across replacement activities	504	days
Average water use for vehicle washing during replacement activities	**1.0**	**m^3/day**
Peak daily vehicle movements	41	-
Peak vehicle washing water use in replacement	**6.15**	**m^3/day**
See Chapter 14: Traffic and Movement (ES Volume 1) **[EN0110012/APP/LVS/06.01.1]*		

3.9.8 The equipment cleaning water demand estimate is based on a typical hose flow rate of 1.5 m^3/hr, consistent with manufacturer data (Ref 10) and engineering guidance for industrial hoses used on construction sites (Ref 4). An average daily cleaning duration of 0.25 hours per cleaning station has been applied, reflecting industry practice for periodic equipment cleaning. It is assumed that only one cleaning station will be active at any one time during replacement activities due to the ad hoc nature of the replacement activities. Table 3-9~~Table 3-9~~ outlines the anticipated water requirements for equipment water during replacement activities.

Table 3-9 Replacement equipment cleaning water

Category	Value	Unit
Number of work areas	1	-
Hose flow rate	1.5	m^3/hr
Average daily cleaning time	0.25	hours
Average replacement equipment cleaning water during replacement activities	**0.38**	**m^3/day**
Total workdays across replacement activities	504	-
Total replacement equipment washing water use	**189**	**m^3**
Peaking factor during peak replacement	3	-
Peak replacement equipment cleaning water	**1.1**	**m^3/day**

[2] Total precipitation days have been estimated based on Met Office long-term averages for Church Fenton weather station, located at Leeds East Airport, located approximately 4km from the Proposed Development.

3.9.9 Dust suppression may be required during replacement activities, particularly during dry weather conditions. Activities such as vehicle movements on unpaved haul roads, and material handling can generate dust. The exact amount of water required for dust suppression is highly variable and cannot be accurately calculated at this stage, as it depends on weather conditions and the proximity of works to receptors. To provide a conservative evaluation, a 10% uplift has been applied to the overall replacement water demand to account for dust suppression, see Section 3.10.

~~3.9~~3.10 Summary

~~3.9.1~~3.10.1 This section presented estimated water demand figures for the Proposed Development, based on a range of assumptions and conservative estimates. These values are indicative only and actual water use may be significantly lower depending on final design, construction phasing, and site-specific conditions. For example, in practice it may be that panel cleaning contractors will come equipped with their own mobile bowsers of water to undertake the work. A full summary of assumptions is provided in Annex B.

~~3.9.2~~3.10.2 Table 3-10~~Table 3-10~~ summarises the anticipated water demands during the construction phase of the Proposed Development. A 10% uplift has been applied to the overall construction water demand to account for dust suppression. This allowance is intended to cover the occasional use of water for dust control near sensitive receptors or in response to requests and will be refined as the construction programme and dust management measures are developed, see Section 3.6.

~~3.9.3~~3.10.3 It should be noted that all figures are indicative and have been calculated using conservative assumptions to ensure robustness at this early stage. In practice, actual water demand may be substantially lower, particularly for dust suppression, which will be limited to active construction zones and subject to phasing, weather conditions, and site-specific mitigation measures. These estimates should be revisited and refined as the construction programme and site logistics are developed in more detail.

Table 3-10 Summary of construction phase water demand

Category	Value	unit
Average amenity water use for construction staff	30.3	m^3/day
Average construction phase vehicle washing water	4.3	m^3/day
Average construction phase equipment cleaning water	3.0	m^3/day
Average construction phase directional drilling water	20.3	m^3/day
10% uplift for construction phase dust suppression water	5.8	m^3/day
Average construction phase water	**64**	**m^3/day**
Peak amenity water use for construction staff	53.4	m^3/day
Peak construction phase vehicle washing water	24.2	m^3/day
Peak construction phase equipment cleaning water	9.0	m^3/day

Category	Value	unit
Peak construction phase directional drilling water	108.1	m^3/day
Peak construction phase water	**195**	**m^3/day**
Total amenity water use for construction staff	21,059	m^3
Total construction phase vehicle washing water	3,010	m^3
Total construction phase equipment cleaning water	2,085	m^3
Total construction phase directional drilling water	4,668	m^3
10% uplift for construction phase dust suppression water	3,082	m^3
Total construction phase water	**33,904**	**m^3**

3.10.4 Table 3-11~~Table 3-11~~ summarises the anticipated water demands during the operational phase of the Proposed Development during routine operation, excluding the temporary additional water demand associated with periodic replacement activities, which would occur only for short durations during the overall operational lifetime of the Proposed Development.~~.~~ The figures presented include amenity water use for operational staff and water required for periodic solar module cleaning.

~~3.9.4~~

Table 3-11 Summary of standard operational phase water demand

Category	Value	unit
Average amenity water use for operational ~~scoping~~ staff	0.02	m^3/day
Average operational phase module cleaning water	2.7	m^3/day
Average standard operational phase water	**~~2.~~2.7~~7~~**	**m^3/day**
Peak amenity water use for operational staff	0.02	m^3/day
Peak operational phase module cleaning water	34	m^3/day
Peak standard operational phase water	**34~~34~~**	**m^3/day**

3.10.5 Replacement activities are expected to occur intermittently throughout the 60-year operational life of the Proposed Development. For the purposes of estimating total replacement water demand, a conservative assumption has been made that replacement activities are equivalent to a cumulative two-year programme over the operational life of the Proposed Development. Whilst replacement activities could result in short-term increases in operational water demand, these activities are expected to occur intermittently throughout the operational life of the Proposed Development and therefore do not represent a continuous operational water requirement. A 10% uplift has been applied to the overall replacement water demand to account for dust suppression.

3.10.6 A conservative worst-case assessment indicates that simultaneous peak operational and peak replacement activities could result in a combined peak daily demand of approximately 74 m^3/day. However, it is not anticipated that peak module cleaning demand and peak replacement activities would occur

concurrently in practice, and actual peak operational water demand is therefore expected to be lower than this worst-case estimate.

Table 3-12 Summary of replacement water demand

Category	Value	unit
Average amenity water use for replacement staff	11.3	m^3/day
Average replacement vehicle washing water	1.0	m^3/day
Average replacement equipment cleaning water	0.38	m^3/day
10% uplift for replacement dust suppression water	1.27	m^3/day
Average replacement water		**m^3/day**
Peak amenity water use for replacement staff	32.5	m^3/day
Peak replacement vehicle washing water	6.15	m^3/day
Peak replacement equipment cleaning water	1.1	m^3/day
Peak replacement water	**39.8**	**m^3/day**
Total amenity water use for replacement staff	5,685	m^3
Total replacement vehicle washing water	505	m^3
Total replacement equipment cleaning water	189	m^3
10% uplift for replacement dust suppression water	63.8	m^3
Total replacement water		**m^3**

4 Water supply

4.1 Introduction

4.1.1 This section explores potential water supply options to meet the construction and operational demands of the Proposed Development. Given the scale and distributed nature of the Site, multiple sources have been considered, including mains water, groundwater abstraction, surface water abstraction, surface water runoff reuse, and water tankering. Each option has been assessed based on feasibility, regulatory constraints, and site-specific considerations.

4.2 Mains water supply

4.2.1 The mains water supply for this area is provided by Yorkshire Water (YW). YW has been approached regarding a potential connection of mains water services to the Proposed Development. YW has confirmed that they can supply both the estimated peak construction and operational water demand for the project and have highlighted some potential connection points which are shown in Plate 4-1~~Plate 4 1~~ to Plate 4-2~~Plate 4 2~~. As these connection points are within the Order limits, it would therefore be possible to take mains water supply for the Proposed Development (with tankering to other parts of the Order limits where necessary) without the need for development outside of the Order limits.

~~4.2.1~~4.2.2 Subsequent discussions with YW have indicated that additional connection points may also be available, however, their locations have not yet been confirmed and are therefore not shown. ~~.~~For ES purposes, water tankering is assumed as the base case for distribution across the site, given its dispersed layout.

4.2.3 With YW's confirmation of supply capacity and suitable connection points, mains water is considered a viable option for meeting the requirements of the Proposed Development, including for supplying fire water at the BESS, however this would depend on connection approvals and installation. Mains water offers high-quality supply for both potable and non-potable uses. It is typically associated with lower capital costs compared to abstraction or tankering, but unit costs per m^3 may be higher. Additionally, lead-in times for connection approvals and installation may affect construction scheduling and should be considered in programme planning. Further discussions with YW will clarify connection logistics, volumes, and pricing.

Plate 4-1 Site 1 potential Yorkshire Water mains connection points

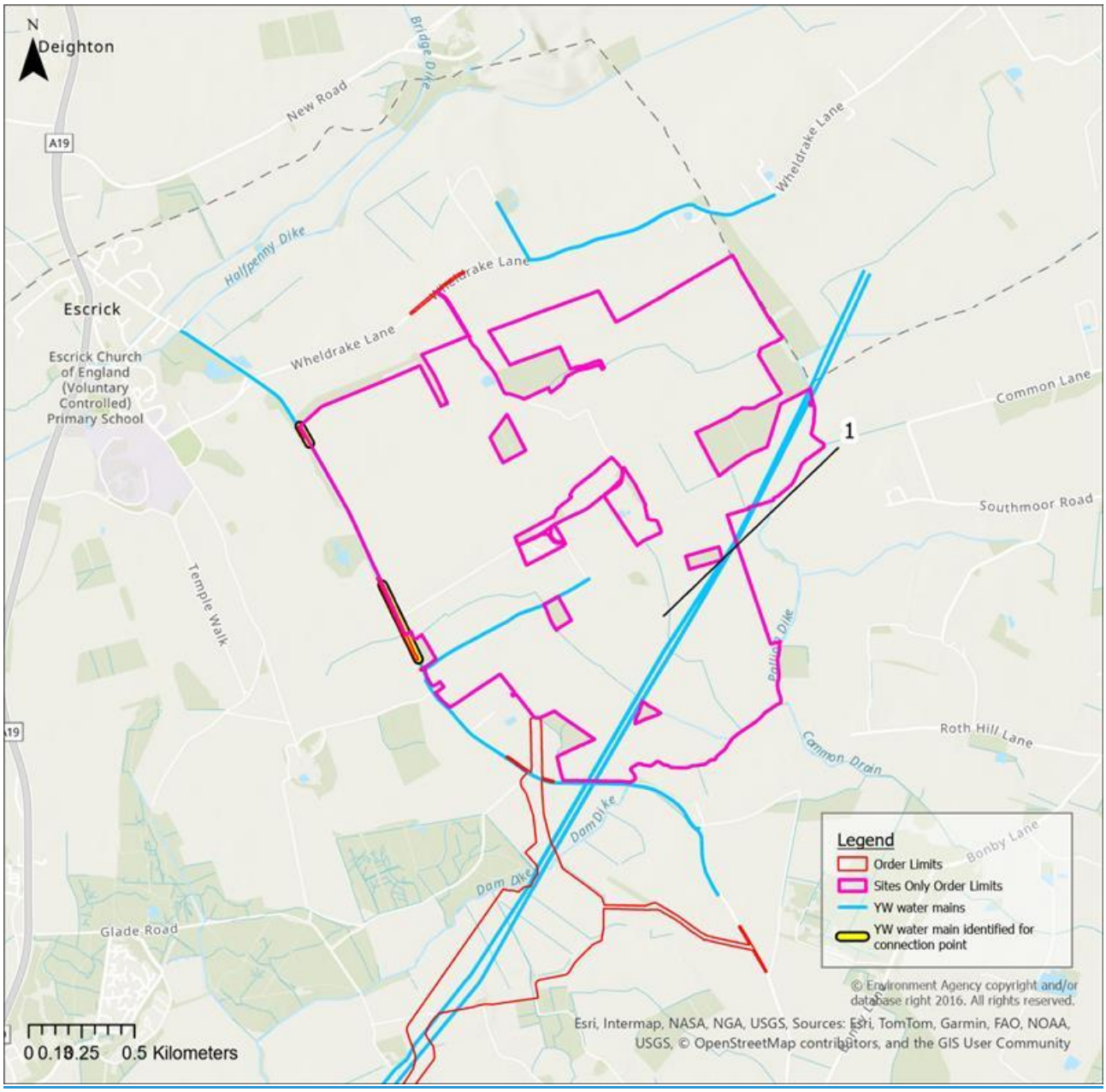
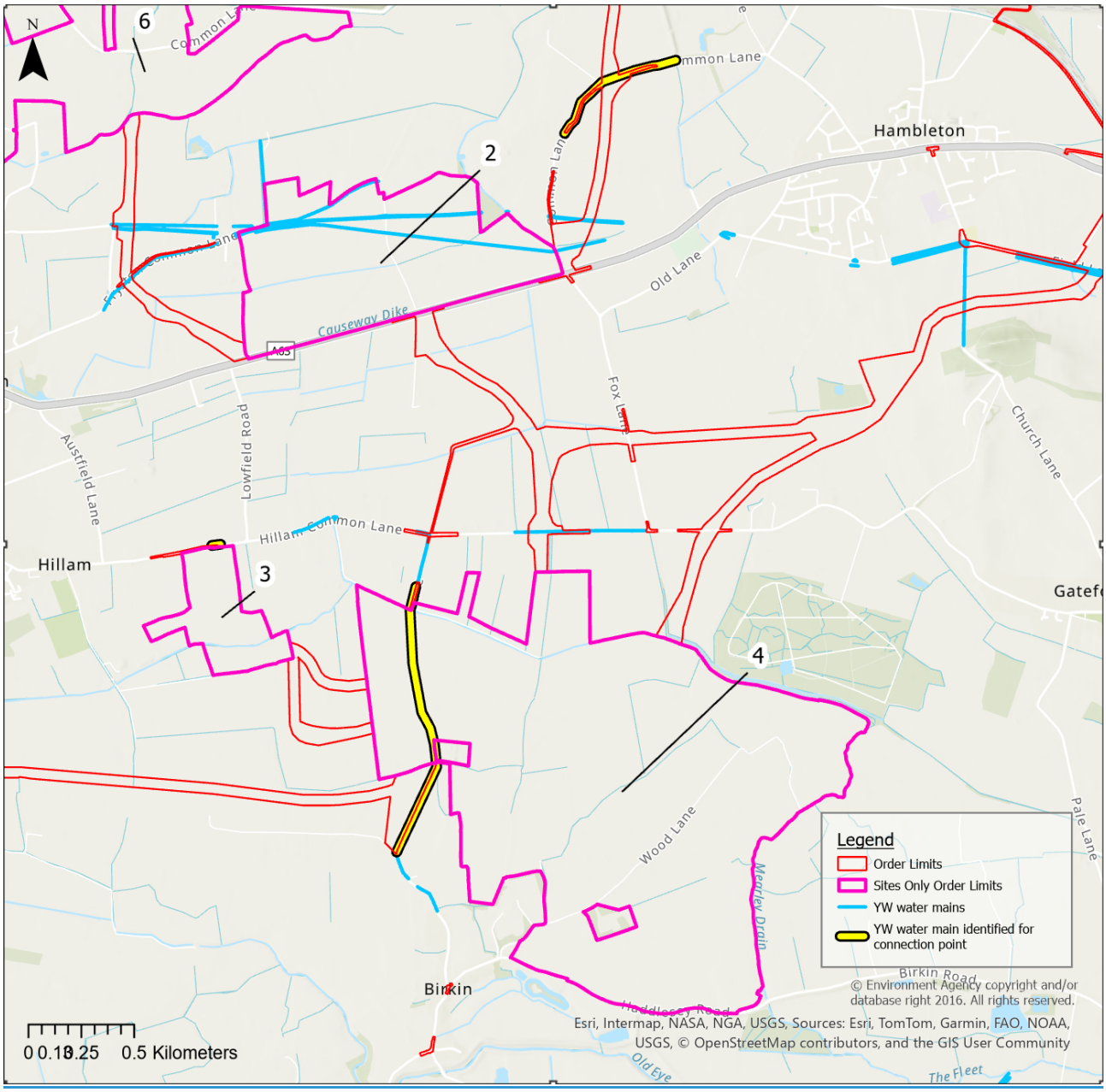


Plate 4-2 Site 2, 3, 4, 6, 7 and 8 potential Yorkshire Water mains connection points



4.2.2

4.3 Abstraction licencing

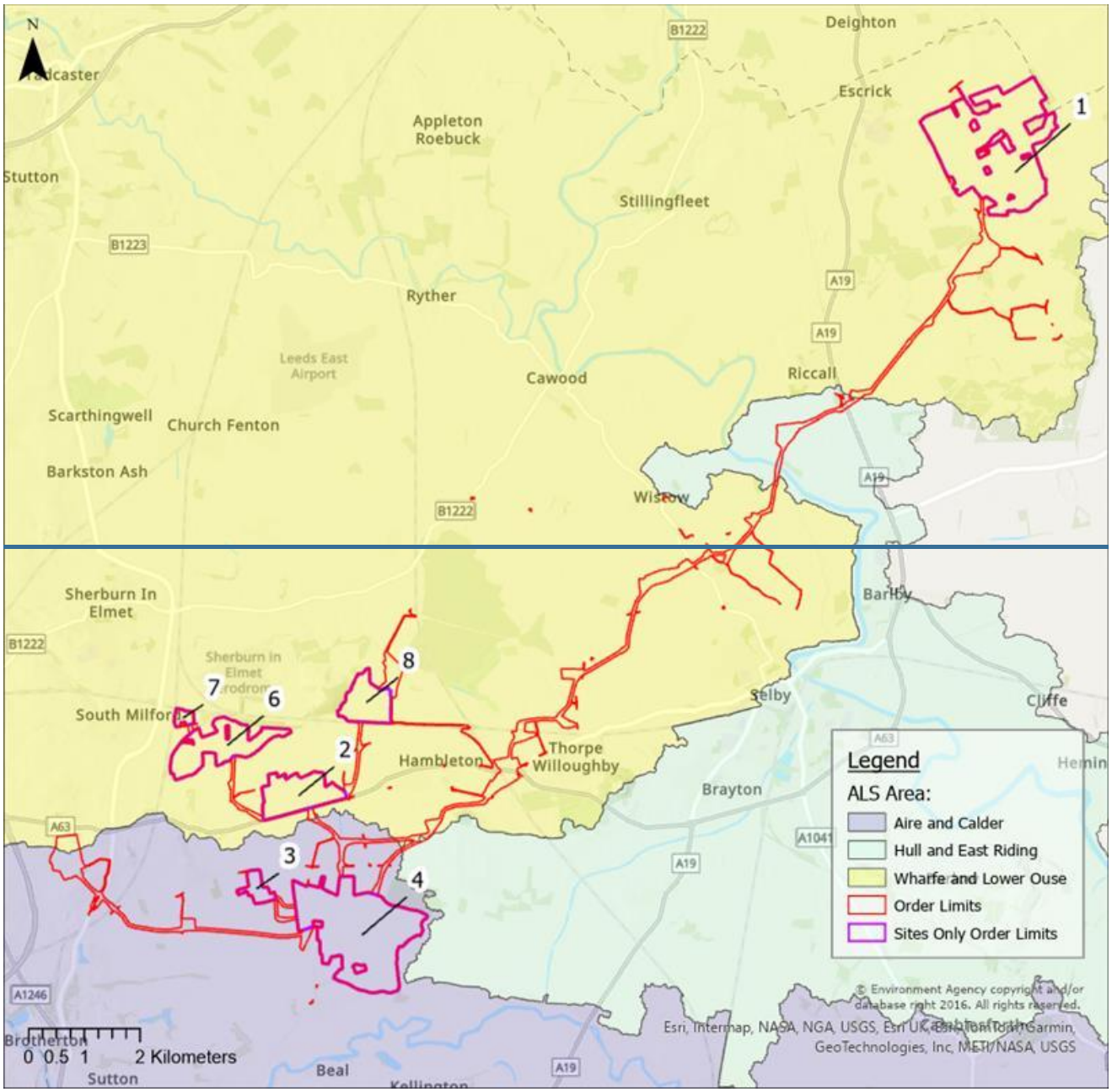
Abstraction feasibility and considerations

4.3.1 Water abstracted from either groundwater or surface water sources would typically be obtained via point abstractions, such as boreholes or river intakes. Given the dispersed nature of the Proposed Development, this would require a distribution system to transport water to active construction zones, which may include temporary pipelines, bowsers, or tankering arrangements.

4.3.2 The EA Abstraction Licensing Strategies (ALS) establish specific restrictions on water abstraction within various catchments. The Proposed Development is located within the Aire and Calder ALS (Ref 9) area as well as the Wharfe and Lower Ouse ALS area (Ref 8); segments of the Cable Route Corridor routes also traverse the Hull and East Riding ALS area (Ref 7). ALS catchment areas are shown in Plate 4-3. The most recent update to the Aire and Calder ALS occurred in 2025, while both the Wharfe and Lower Ouse ALS and the Hull and East Riding ALS were last updated in 2013.

4.3.3 The Hull and East Riding ALS includes the section of the River Ouse that intersects the Cable Route Corridor. Portions of the Cable Route Corridor route between Solar Development Sites 1 and 4 lie within this region. Owing to this area not including any Solar Development Sites, it is deemed less appropriate for water supply purposes. Extracting water from this location would require additional transportation to deliver it to the designated Solar Development Sites. Therefore, abstraction from within the Hull and Riding ALS catchment has not been considered further in this assessment.

Plate 4-3 Abstraction Licensing Strategy Catchment Areas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Legend
ALS Area:
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Hull and East Riding
Wharfe and Lower Ouse
Order Limits
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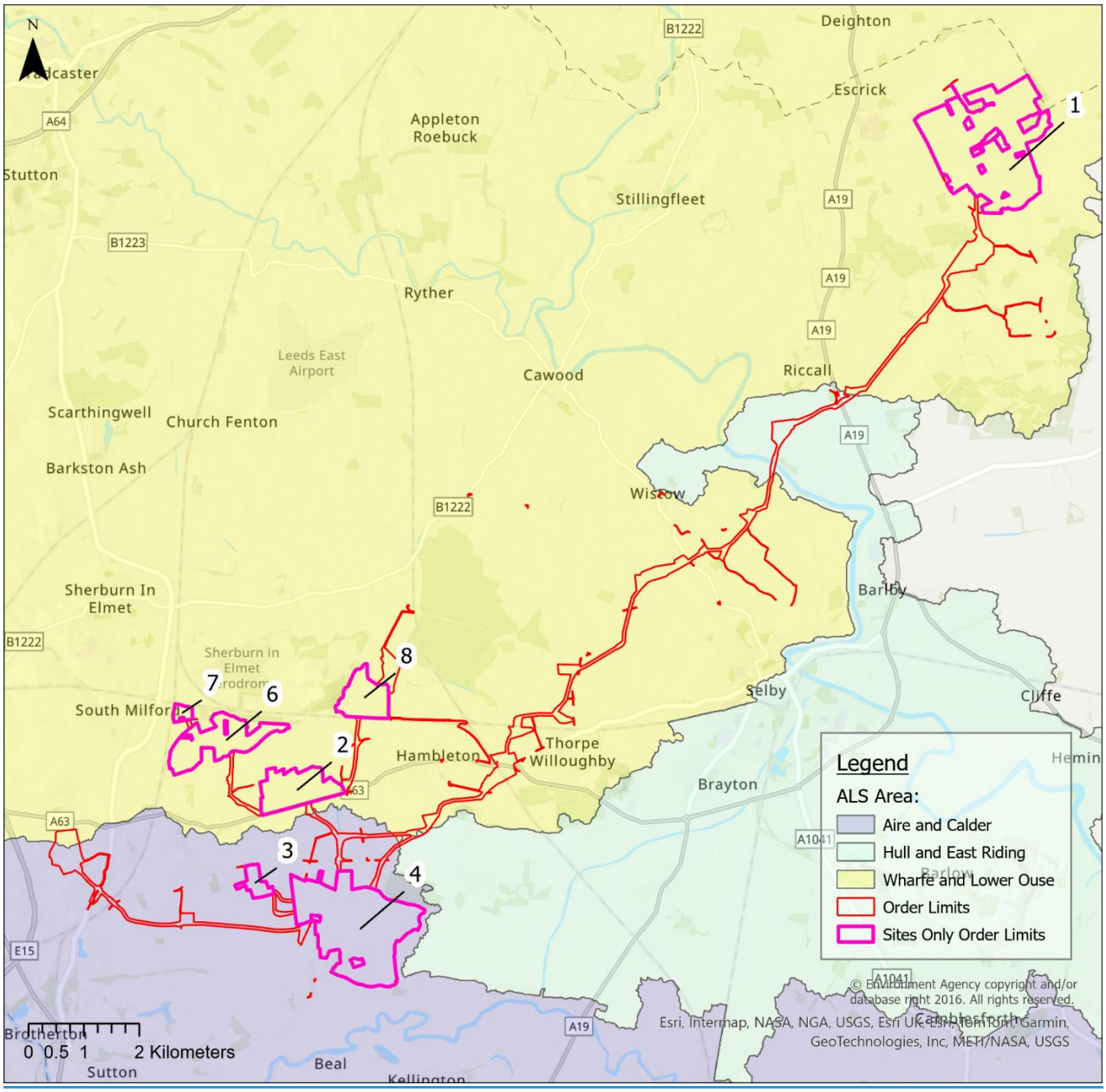


Groundwater supply

Local aquifers

4.3.4 A groundwater abstraction may be a viable option for water supply to the Proposed Development depending on the suitability of local aquifers as well as licensing restrictions set out by the EA within relevant ALS. The EA classifies aquifers based on their ability to store and transmit water, which directly influences their suitability for abstraction. Aquifer classifications are as follows:

1) Principal Aquifers: provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.

2) Secondary A Aquifers: comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

3) Secondary B Aquifers: mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers.

4) Secondary (undifferentiated): aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor importance.

5) Unproductive Strata: largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them.

4.3.5 The underlying bedrock geology at the Proposed Development comprises the Sherwood Sandstone Group to the east and the Zechstein Group to the west. The latter is comprised of separate rock types of the Roxby, Brotherton, Edlington and Cadeby Formations. Details of each of these formations including aquifer classifications are given in Table 4-1. Groundwater from Principal Aquifers (i.e. Sherwood Sandstone, Brotherton Formation and Cadeby Formation in this instance) is generally of good quality and may require minimal treatment depending on its intended use.

4.3.6 Superficial deposits are present across much of the site, with varying permeabilities and aquifer classifications ranging from Secondary A to Unproductive Strata. These deposits may offer potential for small-scale water supply but would require site-specific investigation to determine yield and quality. Superficial aquifers are not considered within the EA's ALS, meaning any abstraction would be subject to bespoke assessment and permitting.

Table 4-1 Bedrock geology aquifer classifications

Bedrock geology	Lithological description	Aquifer classification [1]
Sherwood Sandstone	Triassic sandstone	Principal
Roxby Formation	Calcareous mudstone	Secondary B
Brotherton Formation	Variable dolomitic limestone	Principal
Edlington Formation	Calcareous mudstone	Secondary B
Cadeby Formation	Dolomitic limestone	Principal

Aire and Calder Abstraction Licensing Strategy

4.3.7 Licence restrictions on groundwater abstractions within the Aire and Calder ALS area are organised according to Groundwater Management Units (GWMUs). This includes the Aire and Calder Magnesian Limestone GWMU, primarily comprised of the Zechstein Group, which underlies Solar Development Site 3 and the western Cable Route Corridor, as well as the Aire and Calder Sherwood Sandstone GWMU, which underlies most of Solar Development Site 4.

4.3.8 The Aire and Calder Magnesian Limestone GWMU is classified as 'water available' for licensing, although this would be assessed on a case-by-case basis.

4.3.9 The Aire and Calder Sherwood Sandstone GWMU is classified as 'water not available' and no new licences will be granted. Licence trading (a concept explained below) may be considered within the Aire and Calder Sherwood Sandstone GWMU where:

1) there is no net increase in actual abstraction; and
2) it is demonstrated that there is no overall detrimental impact to the aquifer.

Wharfe and Lower Ouse Abstraction Licensing Strategy

4.3.10 This outlines that there is 'restricted groundwater available' within the Sherwood Sandstone Group except around Selby where groundwater is classified as 'not available'. Around Selby no new groundwater licenses will be granted however licence trading will be considered. North of Selby, where Solar Development Site 1 is located, the ALS indicates that new groundwater applications will be considered, subject to assessment of local conditions and dependent on the outcome of groundwater pump tests. Any new licence applications will be assessed on a case-by-case basis.

Surface water supply (watercourses)

4.3.11 Water may be sourced through abstraction from surface water bodies such as rivers and streams. The Proposed Development is situated within proximity to several watercourses, including the River Aire, Selby Dam, and the River Ouse, and various smaller tributaries. The feasibility of abstracting from these watercourses is outlined within the EA's ALS.

4.3.12 Surface water quality is variable and would likely require filtration or disinfection prior to use, particularly for amenity or equipment cleaning purposes. The level of treatment required will depend on the source, intended use, and regulatory requirements.

Aire and Calder Abstraction Licensing Strategy

4.3.13 The Aire and Calder ALS covers the River Aire catchment area up to its discharge into the River Ouse north of Goole. At the location of the Proposed Development, water is available for licensing up to Q95, beyond which availability becomes restricted. Consequently, new licences may be considered subject to local and downstream impacts, and it is likely that Hands-off Flow (HoF) conditions will be imposed, requiring abstraction to cease when river flows fall below a specified threshold. Licence trading may also be considered.

Wharfe and Lower Ouse Abstraction Licensing Strategy

4.3.14 The Wharfe and Lower Ouse ALS, encompasses Selby Dam in the south close to Solar Development Sites 2, 6, 7 and 8 and also the Ouse in the north close to Solar Development Site 1. At Solar Development Sites 2, 6, 7 and 8 there is water available until Q70 when it becomes restricted and at Solar Development Site 1 water is available for licensing up to Q95, beyond which availability becomes

restricted. Therefore, similar to The Aire and Calder ALS it is likely that a HoF condition will apply to any new licences and licence trading may be considered.

Repurposing existing licences

4.3.15 Licence trading is the permanent or temporary buying and selling of water abstraction rights between existing licence holders, allowing water to be reallocated from one user to another without increasing the total amount of water abstracted from a river or groundwater.

4.3.16 For the Light Valley Solar Project, there is potential to repurpose existing abstraction licences associated with land parcels being utilised by the Proposed Development. For the Proposed Development, there are two existing licence holders whose land is affected by the Proposed Development and where the Applicant holds an option over their land. If these licences are no longer required by the current holders, they could be transferred or repurposed for use by the Proposed Development, subject to agreement with the EA and confirmation that there would be no net increase in abstraction or adverse impact on the aquifer. This could involve a temporary or short-term variation to all or part of an existing licence to meet construction-phase water demand. Alternatively, a permanent variation could be considered to support operational requirements.

4.3.17 Outside of the Order limits, a preliminary review has identified four surface water and three groundwater abstraction licences within or near the Solar Development Sites 1, 2 and 4. These are shown in Plate 4-4. The proximity of these abstraction points to the development sites suggests they may offer a valuable local supply source, though additional connections or tankering may be necessary to transfer water from the sources to other areas of the Proposed Development.

4.3.18 Licence trading will require engagement with current licence holders and the EA to assess feasibility, confirm transfer arrangements and ensure no net increase in abstraction or adverse impact on the aquifer. Early engagement with the EA and existing licence holders would be required to understand feasibility and timelines.

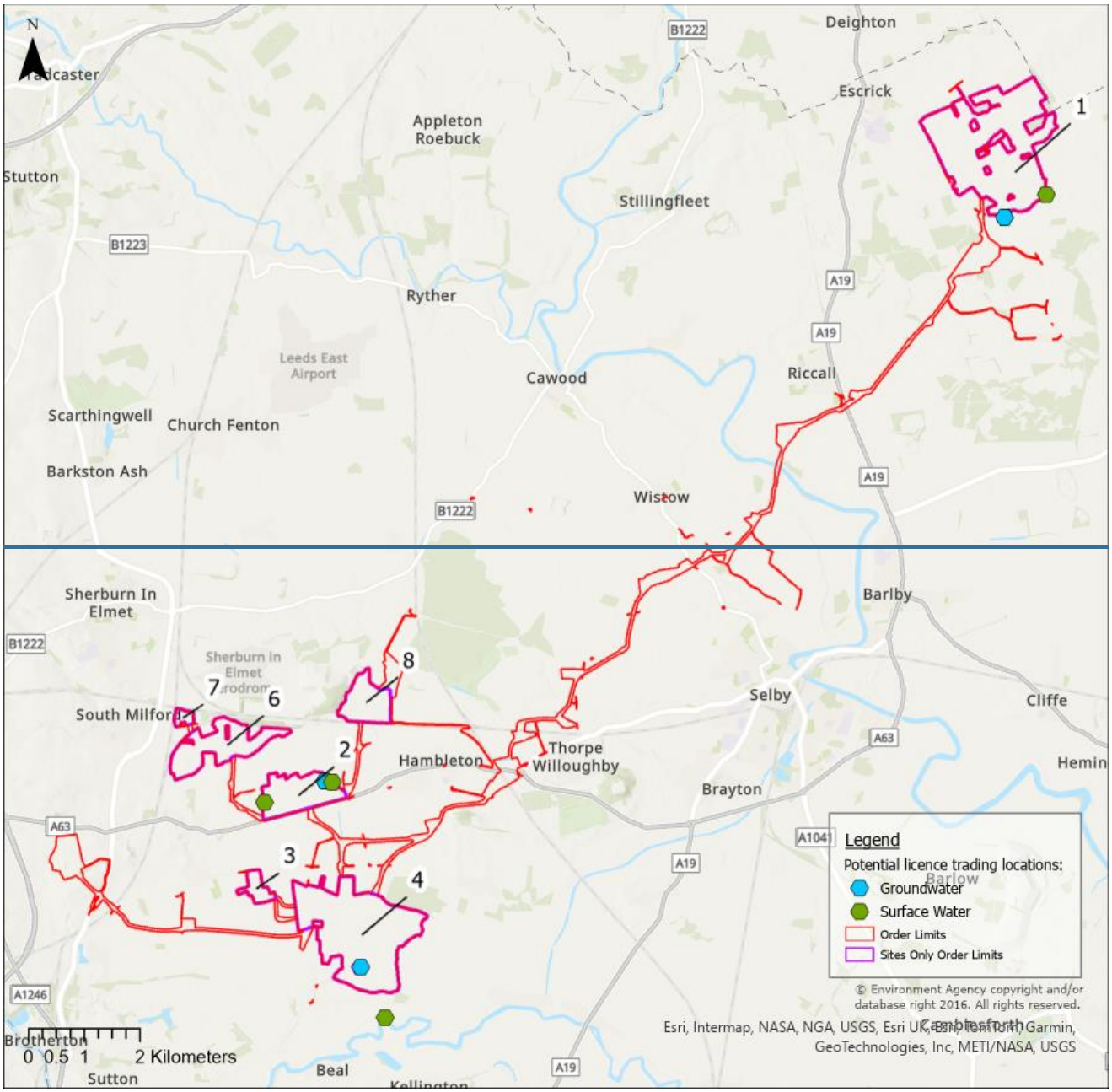
4.3.19 The feasibility of using these licences will depend on their licence limits and historical usage. While the current licence limits are known, the EA will amend these limits during licence transfer or trading, typically restricting the new licence to the ‘recent actual’ volume (last 6 years) that has been abstracted. This approach is set out in the EA’s ALS (Ref 7, Ref 8 & Ref 9) and aims to ensure sustainable abstraction. In the absence of historical usage data, it is not currently possible to estimate how much of the construction or operational water demand could be met through these licences. However, as abstraction licences are only required for volumes exceeding 20 m^3/d, even if each licence is limited to this threshold, four of the seven identified licences would be sufficient to meet the average daily construction demand of 64 m^3/d.

4.3.20 A private water supply is a source of water (from either groundwater or surface water) that is not provided by a statutory water undertaker. Private water supply abstractions below 20 m^3/day may fall outside the requirement for an abstraction

licence when operated as a standalone supply. The Proposed Development Applicant could opt to establish a new private water supply with an abstraction rate of less than 20 m³/day, or to repurpose an existing private water supply associated with land parcels being utilised by the Proposed Development. Repurposing an existing PWS would require agreement with the current supply owner, and investigation to confirm ownership and operational status.

4.3.21 Based on current estimates, a supply of this scale would be sufficient to cover approximately 30% of the average daily construction water requirement. As such, it would need to be used in combination with other supply sources that are not abstraction-licensed for the same operation, such as water tankering or mains supply, to fully meet the Proposed Development's needs during the construction phase. There are several private supplies in proximity to the Proposed Development shown in Plate 4-5. However, the data provided by local authorities does not specify whether these supplies are sourced from groundwater or surface water. Further investigation would be required to confirm the source type, ownership, and operational status of each supply.

Plate 4-4 Potential licence trading abstraction locations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Potential licence trading locations:
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Surface Water
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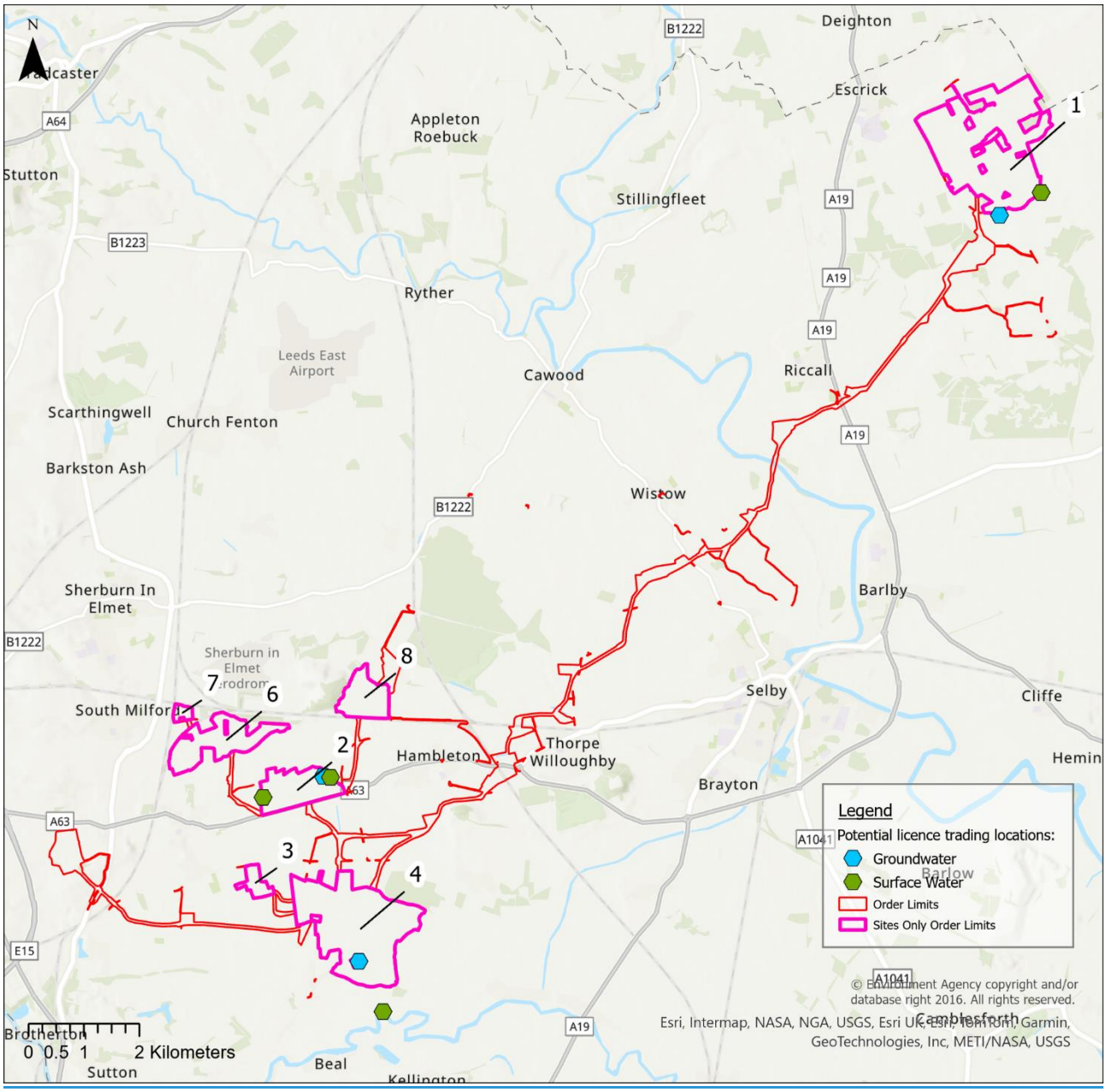
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Potential licence trading locations:
Groundwater
Surface Water
Order Limits
Sites Only Order Limits
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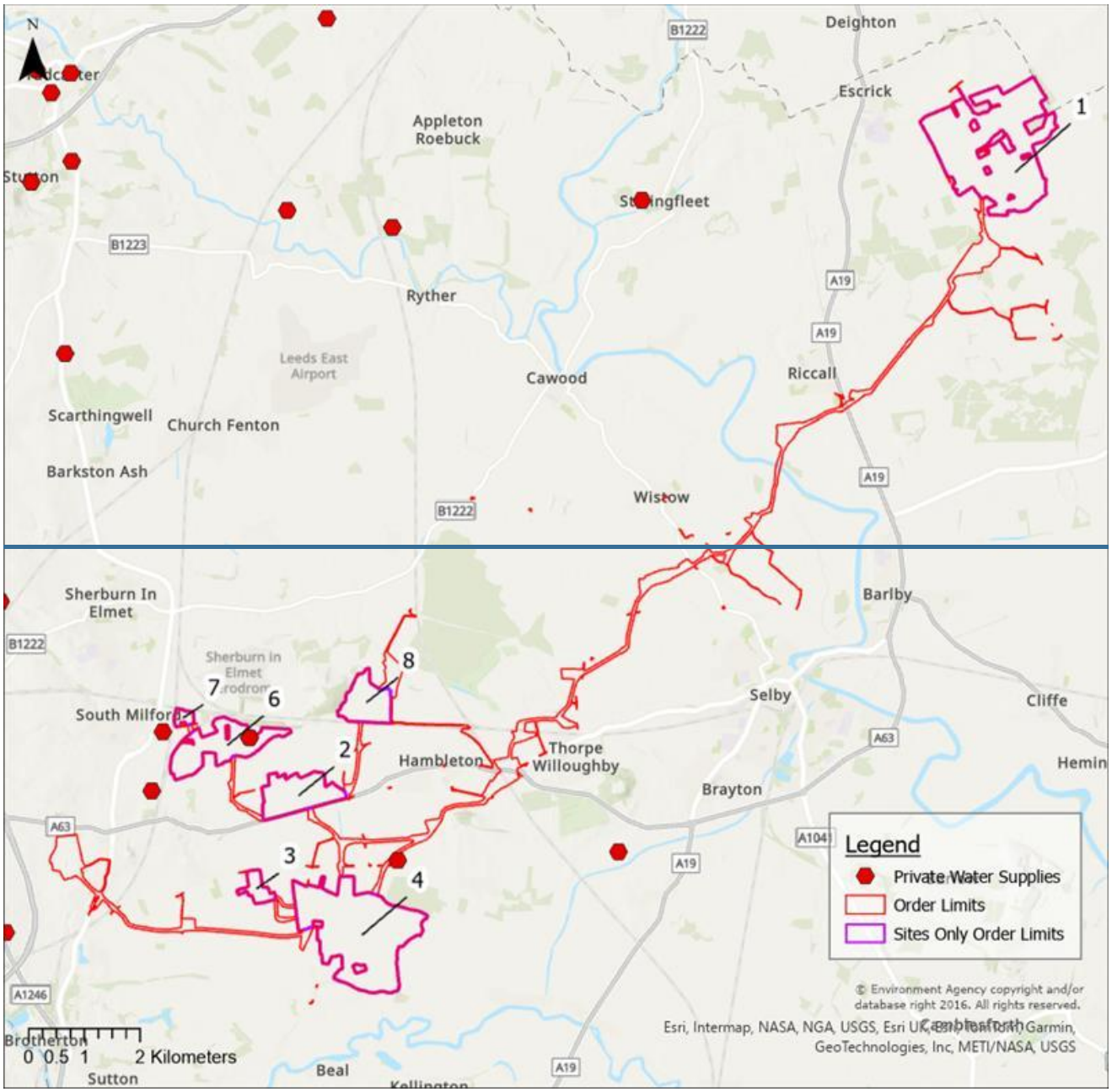
Plate 4-5 Private water supply locations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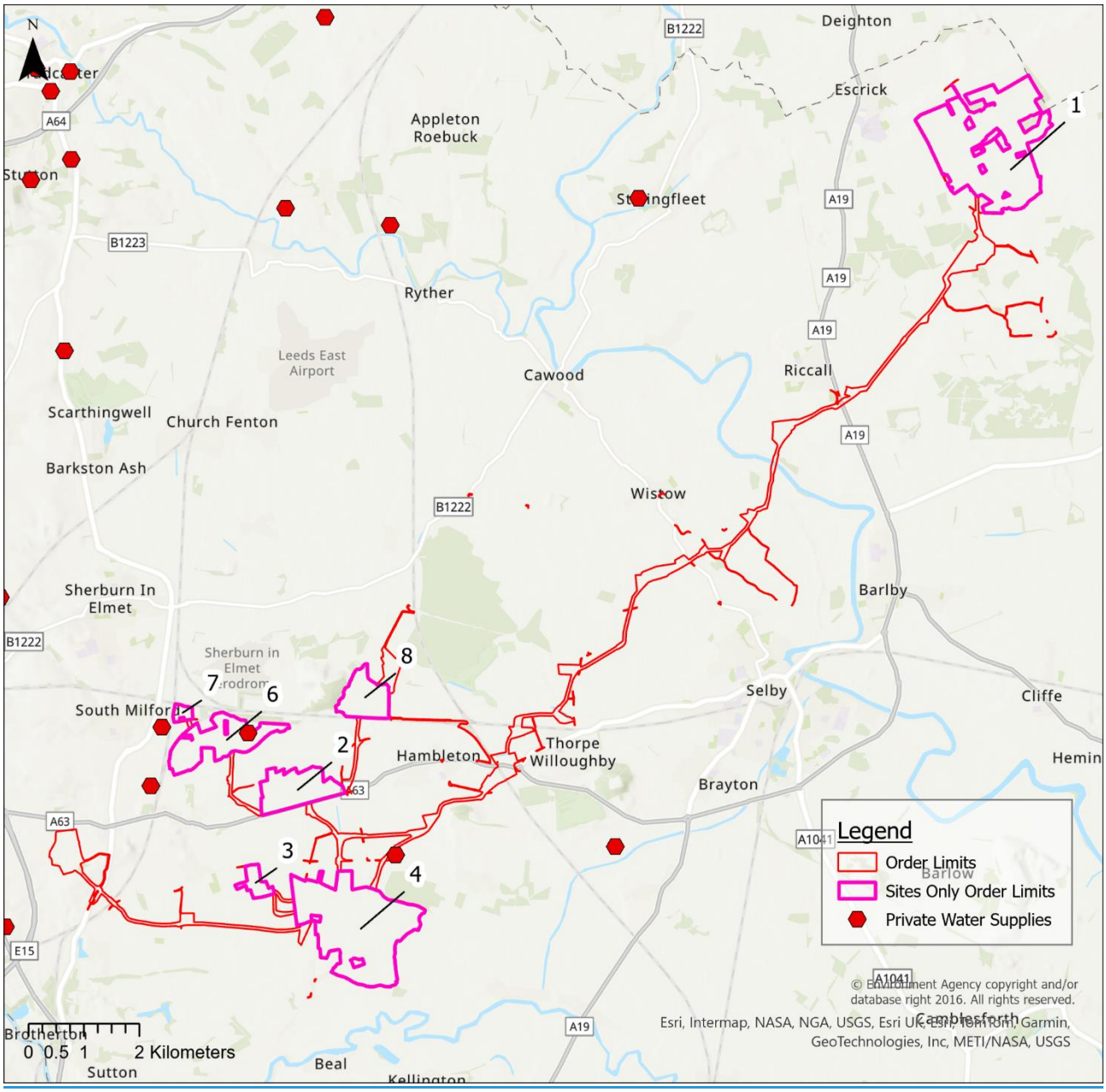

4.4 Surface water supply (runoff)

4.4.1 A detailed drainage assessment has not yet been undertaken. However, the outline Drainage Strategy (Appendix 15.4 (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.04**] states that the Proposed Development will consider opportunities for the collection of surface water for non-potable uses where practical. The use of rainwater systems serving clean roof areas could support non-potable water demand and reduce reliance on potable supplies. For the Proposed Development, roof areas are largely limited to substations, however, these areas could provide a source of clean rainwater suitable for harvesting. The feasibility of such reuse will depend on final drainage design, water quality considerations, available volumes, and the spatial distribution of substations across the site. As such, while surface water runoff may contribute to

meeting water demand, it is unlikely to be a primary supply source. Further assessment will be required once the drainage design is developed.

4.5 Water tankering

4.5.1 Water tankering is being evaluated as a potential water supply method for the construction phase of the Proposed Development. This approach allows for adaptable delivery and distribution, especially on large or dispersed sites. Several water tankering suppliers have been contacted to assess the feasibility of sourcing water via tankers for the Proposed Development.

4.5.2 Three suppliers have indicated capacity to meet the site's average construction water demand. Tanker capacities range from 15 m³ to 30 m³, with the ability to complete multiple deliveries per day.

4.5.3 For typical construction requirements, it is estimated that three 30 m³ or five 15 m³ tankers would be required per day. For peak construction demand, up to thirteen 15 m³ or seven 30 m³ loads per day may be necessary.

4.5.4 For routine operational water needs, a single tanker per day would be adequate, while peak operational demand may require two 30 m³ or three 15 m³ tanker loads per day. Replacement activities would occur alongside routine operation of the Proposed Development. During periods of average replacement activity, the combined operational and replacement water demand would be approximately 14.6 m³/day (2.7 m³/day routine operation plus 11.9 m³/day replacement demand), which could be supplied by a single 15 m³ tanker load per day. A conservative worst-case assessment indicates that simultaneous peak routine operational and peak replacement activities could result in a combined demand of approximately 74 m³/day, requiring either three 30 m³ tanker loads or five 15 m³ tanker loads per day. However, it is not anticipated that peak module cleaning demand and peak replacement activities would occur concurrently in practice, and actual peak operational water demand is therefore expected to be lower than this worst-case estimate.

~~4.5.2~~4.5.5 For fire water movement, set out paragraph 3.1.8, it is anticipated that approximately 8 tanker movements would be required to fill the tanks.

4.6 Summary

4.6.1 A range of water supply options has been evaluated, with each presenting distinct advantages and limitations. The summary of these findings is provided in Table 4-2.

4.6.2 At this stage, the water supply source for the Proposed Development is not confirmed. For ES purposes, water tankering is assumed as the base case for distribution across the site, given its dispersed layout. Water may be sourced from mains supply (subject to agreement with YW), from a water tanker supplier, or via repurposing existing licensed abstractions or private water supplies where viable. Any licence trading or repurposing would need to comply with EA ALS to ensure sustainable abstraction.

4.6.3 It should be noted that licence trading or repurposing of existing abstractions may require water treatment, depending on the quality of the source water. For the purposes of this assessment, it is assumed that if water treatment is required and is not feasible or cost-effective, this option would be ruled out. However, small, temporary package treatment plants are available and could be deployed if appropriate; the costs and operational implications of such systems should be considered as part of the cost-benefit analysis when selecting the preferred water supply option.

Table 4-2 Summary of water supply options

Water supply option	Key considerations	Advantages	Disadvantages
Mains Water	YW contacted; supply feasible with connection points confirmed. Further discussion needed on approvals, logistics, and pricing.	Reliable and high-quality supply. No onsite treatment required for general use.	May require offsite connection and distribution.
Groundwater abstraction	New licences unlikely. Licence trading may be viable with no net increase in abstraction.	Potentially good quality from principal aquifers. May support local supply.	New licences unlikely. Licence trading required. May require treatment depending on water quality.
Surface water abstraction	Potential for new licenses to be considered but would be subject to HoF conditions. Licence trading may be considered.	Proximity to rivers and streams. May support non-potable uses.	Subject to HoF conditions. Licence trading may be required. May require treatment and distribution.
Licence trading	Existing abstractions may be repurposed if land is leased from current holders. Requires EA approval (for licensed abstractions) and no net increase in abstraction.	May provide local supply without need for new licences Supports regulatory compliance	May require treatment depending on water quality. Potential abstraction volumes currently unknown.
Surface Water Runoff	Possible supplementary source depending on final drainage design but unlikely to be a primary source.	May be available from SuDS at Substations / BESS. Moderate quality for non-potable use.	Not available during early construction. Dependent on rainfall and final drainage design. Requires treatment and distribution.
Water Tankering	Potential suppliers have been contacted and confirmed feasibility.	Flexible and mobile supply. High quality water.	High unit cost. Requires coordination and access for deliveries. Not sustainable for long-term operational use.

5 Conclusions and recommendations

5.1 Conclusions

5.1.1 This Water Resources Assessment has evaluated the anticipated water demand for the Proposed Development across both the construction and operational phases. Demand estimates have been developed for key activities including amenity use, vehicle and equipment washing, directional drilling, dust suppression, and solar module cleaning. The estimated average daily water demand for construction, ~~and~~ operation and replacement activities is 64 m^3/d, ~~and~~ 2.7 m^3/d and 11.9 m^3/d, respectively. These estimates are based on a range of conservative assumptions and are intended to demonstrate the general feasibility of water supply options rather than provide finalised figures.

5.1.2 A range of potential water supply options has been considered, including mains water, groundwater abstraction, surface water abstraction, surface water runoff reuse, and water tankering. A combination of supply sources may be required to ensure a reliable and flexible approach, tailored to site-specific conditions and operational requirements. Each option presents distinct advantages and limitations, summarised in Table 4-2. At this stage:

~~1)~~3) **Mains Water:** YW has been contacted and confirmed the feasibility of ~~a~~ mains connections within the Order Limits to meet peak and average demand and identified potential connection points. Further engagement is required to ~~determine~~confirm logistics, volumes, and pricing.

~~3)~~4) **Groundwater and Surface Water Abstraction:** These options may be viable in principle but are subject to significant regulatory constraints. New abstraction licences are unlikely to be granted in key areas of the site, particularly within the Sherwood Sandstone Groundwater Management Unit (GWMU), which is classified as ‘water not available’. However, licence trading presents a potential opportunity.

A preliminary review has identified several existing abstraction licences located within or near Solar Development Sites 1, 2 and 4. If these licences are no longer required by the current holders, they could potentially be transferred or repurposed for use by the Proposed Development. These may offer a valuable local supply source. Recent abstraction volumes are currently unknown, so it is not yet possible to quantify their contribution to construction or operational water demand. This approach would require early engagement with licence holders and the EA to confirm eligibility and ensure no net increase in abstraction or adverse impact on the aquifer.

The Proposed Development may opt to establish a new private water supply with an abstraction rate of less than 20 m^3/day, or to repurpose an existing private water supply. Abstractions of less than 20 m^3/day may fall outside the requirement for an abstraction licence when operated as a standalone supply, providing a flexible option for meeting part of the construction water demand. Any such supply would need to operate

independently of any other licensed abstraction associated with the Proposed Development. Based on current estimates, a supply of this scale would be sufficient to cover approximately 30% of the average daily construction water requirement. As such, it would need to be supplemented by other supply sources that are not abstraction-licensed for the same operation, such as water tankering or mains supply, to fully meet the Proposed Development's needs during the construction phase.

4)5) **Surface Water Runoff Reuse:** While runoff from SuDS features may offer supplementary water supply, particularly for non-potable uses such as equipment cleaning, its reliability is limited by rainfall variability and the timing of SuDS basin construction. This option should be revisited once the drainage design is finalised.

5)6) **Water Tankering:** Tankering has been confirmed as a feasible option for the construction phase, with supplier capacity aligned to average daily demand. It offers flexibility and mobility, particularly for a dispersed site layout, and may be used as a primary or contingency supply source. However, it is associated with higher unit costs and logistical requirements and is unlikely to be suitable for long-term operational use.

5.2 Next steps

5.2.1 Following the preliminary assessment of water resources, the Applicant will be undertaking the following next steps:

1) Initiate discussions with existing licence holders to explore groundwater and surface water licence trading opportunities.
2) Confirm tankering logistics including delivery routes, access points, and contingency planning for peak demand periods.
3) Engage with YW to confirm logistics, volumes, and pricing.
4) Refine water demand estimates as the design progresses, particularly for dust suppression and directional drilling, to reflect actual phasing and activity areas.
5) Reassess BESS cooling requirements once system specifications are confirmed, to determine if additional operational water demand should be included.

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Annex A Environment Agency PEIR Consultation Feedback

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Environment Agency

Appendix D – Water Resources

WR1 – Water Demands

Document Reference(s): PEIR Volume 1, Chapters 1 to 4, Sections 2.7.40-2.7.42	
Issue	There remains an inadequate assessment made for the water demands of the project. It is unclear if the 4,312m3 detailed in Section 2.7.40 includes all consumptive uses of water, or only potable and domestic uses. Water company supply from mains connections may not be practical in this area.
Impact	Potential insufficient water supply for the project could lead to delays in the project's timeline.
Solution	Consultation with the water company is required to determine its availability and practicality at locations required. Confirm potential sources of supply to meet consumptive water demands identified by the project. 4,312m3 is a relatively small amount of water and there is good availability for water resources in this catchment. We require this to be expanded on in more detail within the ES. This will provide further reassurances that water supply has been options appraised robustly, and thereby avoid it becoming a problem at pre-commencement stage.
Additional narrative/explanation Consumptive uses of water during the construction phase for projects of this scale often include (but may not be limited to): • dust suppression; • bentonite clay mixing/drilling fluids for Hydraulic Directional Drilling (HDD); • wheel/concrete washing; • Battery Energy Storage System (BESS) cooling. We are encouraged to see that the quantities of water required are estimated at this stage, however we require a fuller account of what the consumptive uses will be. We are also pleased to see different sources of supply being considered.	

Additional Comments

Chapter 15, Section 15.7.52 provides a good summary of the abstraction licensing strategy in the Aire and Calder catchment and notes that surface water has good availability. Please be aware, new licence conditions may only include a cessation condition relating to a minimum residual flow cessation for surface water bodies and only restrict abstraction during periods of prolonged dry weather and drought. This should nevertheless still be planned for.

Annex B Summary of Water Demand Assumptions

Summary of Water Demand Assumptions

B.1.1. A range of assumptions and conservative estimates have been used to estimate water demand and are summarised below.

General assumptions

B.1.2. It is assumed that the BESS cooling systems implemented will be closed-loop and therefore will not result in significant consumptive water use.

B.1.3. It is understood that concrete used during construction will be delivered to site as ready-mixed product. As such, it does not require additional water for mixing on site, and therefore does not contribute to construction-phase water demand.

B.1.4. The water required to fill firefighting water storage tanks has been excluded from calculations as the water demand is not on a per day/year basis during operation, although the volumes required are considered within this report, and would be subject to agreement with North Yorkshire Fire and Rescue Service.

B.1.5. Construction is assumed to occur over 278 working days per year, based on the working hours set out in Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**].

B.1.6. The construction period is expected to be 2.5 years, in line with the 2 to 3 years set out in Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**].

B.1.7. Assumed 252 working days during operational phase, based on standard UK working days.

B.1.8. Assumed an average of 116 precipitation days per year based on Met Office long-term averages for Church Fenton weather station, located at Leeds East Airport, located approximately 4 km from the Proposed Development (Ref 13).

Amenity water use ~~(construction and operation)~~

B.1.9. 60 litres/person/day is assumed for amenity water use, based on BS 8551:2015 for open industrial sites (Ref 4).

B.1.10. Peak construction workforce is estimated at 890 workers and average construction workforce is estimated at 505, based on data presented in Chapter 2: The Proposed Development (ES Volume 1) [**EN0110012/APP/LVS/06.01.02**].

B.1.11. Operational staff are estimated at 2 staff members visiting five times per month. Staff requirements are not expected to exceed this, therefore peak operational staff numbers is consistent with average operational staff numbers.

~~B.1.11.~~B.1.12. Peak replacement workforce is estimated at 541 workers and average replacement workers is estimated at 188, based on data presented in Chapter 1 – 4 (ES Volume 1) [**EN0110012/APP/LVS/06.01[01-04]**].

~~Construction v~~Vehicle washing water

B.1.13. HGV movement estimates on Solar Development Sites are based on data presented in the Transport Assessment (Appendix 14.1 (ES Volume 3) **[EN0110012/APP/LVS/ 06.03.14.01])**.

~~B.1.12.~~B.1.14. It has been assumed that replacement activities would generate vehicle movements equivalent to the non-cable construction traffic.

~~B.1.13.~~B.1.15. Vehicle wheel water use estimated at 150 litres per vehicle based on published data (Ref 3).

~~Construction e~~Equipment cleaning water

~~B.1.14.~~B.1.16. The equipment cleaning water demand estimate is based on a typical hose flow rate of 1.5 m³/hr, consistent with manufacturer data (Ref 12) and engineering guidance for industrial hoses used on construction sites (Ref 6).

B.1.17. An average daily cleaning duration of 0.25 hours per cleaning station has been applied, reflecting industry practice for periodic equipment cleaning (Ref 13).

~~B.1.15.~~B.1.18. It is assumed that only one cleaning station will be active at any one time during replacement activities due to the ad hoc nature of the replacement activities.

~~Construction d~~Directional drilling water

~~B.1.16.~~B.1.19. Directional drilling water use is based on volume of earth removed, with a fluid ratio of 4:1 due to mixed soil types (Ref 5).

~~B.1.17.~~B.1.20. Water use calculated from earth volume removed using drill diameter and length.

~~B.1.18.~~B.1.21. Estimates are based on preliminary HDD route and configuration assumptions (as of October 2025).

~~B.1.19.~~B.1.22. An HDD construction phase duration of 229.5 days has been applied, reflecting the anticipated programme for these activities.

~~B.1.20.~~B.1.23. Peak daily water usage for HDD is estimated based on the assumption that up to 170 m of drilling can be completed in a single day (Ref 14), with no further HDD activities occurring during that period.

~~Operational m~~Module cleaning water

~~B.1.21.~~B.1.24. 920,000 solar modules are assumed for operational cleaning estimates.

~~B.1.22.~~B.1.25. Assumed solar modules have 2.7 m^2 surface area.

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