



Homers Farm inert landfill: Environmental Risk Assessment



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Homers Farm inert landfill: Environmental Risk Assessment

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1 Introduction

1.1 Report context

Surrey County Council (SCC) granted planning permission (ref: SP/13/00141/SCC) to Henry Streeter (Sand and Ballast) Ltd on 12 January 2015 to allow the extraction of sand and gravel and subsequent restoration to agriculture using inert materials at Homers Farm which is located off Short Lane, Staines-on-Thames, TW19 7BQ (the Site).

Mineral rights for the Site have subsequently been transferred from Henry Streeter (Sand and Ballast) Ltd to Harleyford Aggregates Ltd (Harleyford) (registered in England and Wales as Company Number 00819220). Harleyford is currently preparing to begin mineral extraction from the Site. Harleyford must apply to the Environment Agency for an appropriate Environmental Permit to dispose of inert materials by landfilling during the eventual restoration of the quarry void that will be required.

Stantec UK Ltd (Stantec) has been commissioned by Harleyford to prepare the Environmental Permit application for the proposed inert landfill. Harleyford will be the Operator of the Site as named in the Environmental Permit.

This section of the Environmental Permit application corresponds to Question 6 of Part B2 (Version 12, April 2018) of the application forms, which requires the provision of an Environmental Risk Assessment (ERA) for the proposed activities at the Site.

This assessment is based on the data and information contained within the Environmental Setting and Site Design (ESSD) report (Stantec, 2019a) that has been prepared to support the permit application.

It is noted that risks to the local water environment from the main proposed activities at the Site (i.e. the deposit of inert materials) are considered specifically in a Hydrogeological Risk Assessment (HRA) (Stantec, 2019b). Furthermore, risks from gases are also considered specifically in a Gas Risk Assessment (GRA) (Stantec, 2019c) and a Stability Risk Assessment (GWP, 2019) considers the structural and physical stability of the landfill over its entire lifecycle.

2 Site details and receptors

2.1 Site details

The Site occupies an area of approximately 10.5 hectares and is located c. 1 km to the south of Heathrow Airport in the west of London (see Drawing ESSD1). The Site itself is located on agricultural land, although the surrounding area is largely developed with the A30 located along the southern boundary; with the settlements of Ashford to the south; Stanwell to the west and Feltham to the east.

The general layout of the Site is shown in Drawing ESSD2; the Site entrance is located to the south-west of the Site off Short Lane. The main Site infrastructure (i.e. office and wheel and tyre cleaning equipment) are located close to the entrance.

As detailed in the ESSD report (Stantec, 2019a), the planned development will involve the extraction of an approximate thickness of 6 m of sands and gravels over an area of c. 10 ha; installation of a groundwater cut-off wall / artificially engineered geological barrier (AEGB) around the perimeter of the excavation; and deposition of inert materials to restore the quarry void.

2.2 Receptors

The following list of receptors that are relevant to the environmental risk assessment (ERA) has been identified from the ESSD report (Stantec, 2019a) near the Site (see Drawing ESSD9):

- Residential properties located c. 50 m to the north-west; and c. 50 m to the south [R1].
- A non-residential public meeting room located immediately (<5 m) to the south-east [R2].
- A sports club (which includes playing fields and a residential property) located c. 100 m to the west; and further playing fields located c. 120 m to the north [R2].
- A church and cemetery located 350 m to the west [R2].
- A (aviation) fuel storage facility located immediately (<5 m) to the north [R3].
- A water treatment facility located immediately (<5 m) to the north-east [R3].
- Commercial premises immediately (<5 m) to the south-west and south-east [R3].
- Commercial premises at Westgate Estate located 350 m to the south-east [R3].
- Agricultural fields immediately (<5 m) to the east and c. 10 m to the south-east [R4].
- Nearby public highways (Short Lane <5 m to the west and A30 <5 m to the south) [R5].
- The Site is located within the Kempton Park Gravel Member; which is classified as a Principal Aquifer [R11].
- Various groundwater abstractions located in the vicinity of the Site (including two for spray irrigation located on the Site) [R12].
- Local ponds (including c. 50 m to the north-east) and field drains (including c. 250 m to the east) [R6].
- Various local primary rivers (the closest being Duke of Northumberland's River and Longford River located c. 800 m to the north). *The nature and distance to these receptors and likelihood of relevant pathways suggests that significant risks from the development*

are very unlikely; these receptors have therefore been screened out and will not therefore be considered further in the ERA.

- Other open surface water features (including open areas of water within Bedfont Lakes Country Park (c. 300 m to the south) [R7]; Staines and King George VI reservoirs (c. 1.1 km and 2.4 km to the east respectively) [R8 and R9] and Queen Mary reservoir (c. 2.5 km to the south)) [R10].

- Staines and King George VI reservoirs [R8 and R9] are part of the South West London Waterbodies RAMSAR site and Special Protection Area (SPA). These are wetland areas designated of international importance due to the habitat they provide for water birds. The same area is also designated as Staines Moor Site of Special Scientific Interest (SSSI).

Three Local Wildlife Sites (LWS) are in close proximity to the Site. These are Princes Lake (a designated Site of Nature Conservation Importance (SNCI)) located c. 240 m to the south-west in Clockhouse Pit [R7]; Bedfont Lakes County Park LWS and SNCI [R7] is located c. 800 m to the south-east; and Mayfield Farm and the Water Treatment Works LWS located immediately to the east. They have been designated as such for their ecological importance as habitats for plants and wildlife.

- The closest Listed Buildings (Grade II) are at Welsh School which is located 800 m to the south-west. *The distance and nature of this receptor suggested that significant risks from the development are very unlikely; this receptor has therefore been screened out and it will not therefore be considered further in the ERA.*
- There are two Scheduled Ancient Monuments located 300 m and 700 m to the north-east. Three Areas of High Archeological Potential are located adjacent to the boundaries of the Site.

An archeological assessment conducted to inform the planning application concluded that the Scheduled Ancient Monuments would not be affected by the development and any impact on the Areas of High Archeological Potential would be neutral. *These receptors have therefore been screened out and will not be considered further in the ERA.*

3 Environmental Risk Assessment

3.1 Overview and approach

Guidance for undertaking risk assessments for Environmental Permits (UK Government, 2019) involves the following steps:

1. Identify and consider risks for the site, and the sources of the risks.
2. Identify the receptors (people, animals, property and anything else that could be affected by the hazard) at risk from the site.
3. Identify the possible pathways from the sources of the risks to the receptors.
4. Assess risks relevant to the specific activities involved and check that they are acceptable and can be screened out.
5. State how risks will be controlled if it is considered that they are too high.
6. Submit the risk assessment as part of the permit application.

These steps are described in the following sections. Sections 3.1 and 3.2 identify the relevant sources and receptors respectively (including those that can be screened out). Having then identified relevant pathways, the risk assessment is presented Section 3.3 including proposed control measures where necessary.

3.2 Identification of risks

The Environment Agency guidance states that the risk assessment must identify whether any of the following risks could occur from the Site and associated activities, and what the environmental impact could be:

- any discharge, for example sewage or trade effluent to surface or groundwater;
- accidents;
- odour;
- noise and vibration;
- uncontrolled or unintended ('fugitive') emissions, for which risks include dust, litter, pests and pollutants that shouldn't be in the discharge; or
- visible emissions, for example smoke or visible plumes

There will be no discharges to surface water resulting from the proposed landfill; and neither will there be any visible emissions. Therefore, only discharges to groundwater, accidents, odour, noise and vibration, fugitive emissions (including dust, mud, litter and pests) need to be considered in relation to the proposed development.

3.3 Identification of receptors

The people or parts of the environment that could possibly be potentially harmed or could be at significant risk from the proposed activities at the Site are summarised in Table 3.1.

Table 3.1 Environmental risk assessment receptors

ID	Receptor	Category	Distance (m)	Direction
R1	Residential properties	Human population Residential property	50	North-west
			50	South
			100	West
R2	Public amenities / leisure and sports facilities	Human population Non-residential / non-commercial property	<5	South-east
			100	West
			120	North
			350	South-west
R3	Commercial premises	Human population Commercial property	<5	North
			<5	North-east
			<5	South-east
			<5	South-west
			350	South-east
R4	Agricultural land	Agricultural	<5	East
			<10	South-east
R5	Public highway (Shorts Lane and Staines Lane (A30))	Infrastructure	<5	West
			<5	South
R6	Field drains / surface water features	Surface water	<50	North-east
			200	West
R7	Bedfont Lakes County Park / Clockhouse Pit	Public amenity Surface water Protected sites (ecology)	300	South
R8	Staines reservoir	Surface water Protected sites (ecology)	1,100	East
R9	King George reservoir	Surface water Protected sites (ecology)	2,400	East
R10	Queen Mary reservoir	Surface water	2,500	South
R11	Groundwater in Kempton Park Gravel Member (Principal Aquifer)	Groundwater	0	-
R12	Groundwater abstractions	Agricultural (irrigation)	0	-

3.4 Risk assessment

The ERA for the proposed activities at the Site is presented in Table 3.2. In this table, the risk is determined by the probability of a hazard occurring and the likely consequences of any impact. The assessment of risk presented then identifies the residual risk that remains after implementation of the preventative measures (i.e. risk management). Risk assessment definitions and the risk estimation matrix are presented in Appendix A.

Table 3.2 Risk assessment and management plan

<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
<i>Odour risk assessment and management plan</i>						
Potential odours from inert materials used for restoration	Sensitive receptors R1, R2, R3, R7	Air	<p>Proposed restoration materials are inert, with negligible risk of odour.</p> <p>Waste acceptance procedures will ensure that only inert materials are received / placed.</p> <p>Any materials found to be odorous will be removed from the Site within one day.</p> <p>The Site operating plan requires the site manager to qualitatively assess odour each working day; if any odour issues are perceived measures will be taken to remediate the effect and may include the application of odour masking agents.</p> <p>Any complaints received associated with odour will be recorded and investigated in line with the Site operating plan.</p>	Low – due to the nature of the restoration materials; probability may be influenced by prevailing wind direction it will however generally decrease with distance from the Site	Medium/Low – causing odour annoyance	Low – due to the nature of the materials allowed for restoration and the management procedures reduce the likelihood of a potential impact

<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
<i>Noise risk assessment and management plan</i>						
Noise from vehicles and plant delivering and undertaking restoration activities	Sensitive receptors R1, R2, R3, R7	Air	<p>Deliveries and restoration activities will only take place during permitted operational times.</p> <p>Routine maintenance will be carried out on all site equipment to ensure effective operation and minimisation of unnecessary noise.</p> <p>The Site operating plan requires the Site manager to qualitatively assess noise each working day; if excessive noise issues are perceived the cause will be investigated and action taken to minimise / prevent them.</p> <p>Any events or complaints received associated with noise will be recorded and investigated according to the Site operating plan.</p>	Low – due to the nature of the restoration materials; probability may be influenced by prevailing wind direction it will however generally decrease with distance from the Site	Medium/Low – causing noise annoyance	Low - due to the nature of the materials allowed for restoration and the management procedures reduce the likelihood of a potential impact
<i>Fugitive emission risk assessment and management plan</i>						
Dust or particulates to air from deliveries and restoration activities	Sensitive receptors R1, R2, R3, R4, R5, R7, R8, R9, R10	Air	<p>All vehicles delivering restoration materials will be required to be sheeted or netted.</p> <p>Internal site haul roads will be maintained until completion of the works.</p> <p>Site roads, stockpiles and operational areas will be sprayed with water as</p>	Medium – due to the nature of the activity	Medium – health risk to workers and neighbours, risk to protected sites and agricultural land from smothering, nuisance risk to	Low – the management procedures reduce the likelihood of a potential impact

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<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
			<p>required to minimise dust and particulate emissions.</p> <p>Appropriate speed limits will be in force on internal roads.</p> <p>Vehicle wheel washing facilities will be provided.</p> <p>The Site operating plan requires the site manager to qualitatively assess dust each working day; if any dust issues are perceived measures will be taken to minimise / prevent the emissions</p>		vehicles and / or property	
Leaching of contaminants and / or suspended solids from restoration materials stored on the Site and run-off to local waters	Sensitive receptors R6, R7, R11, R12	Run off to surface water and groundwater	<p>Proposed restoration materials are inert, with negligible risk of significant leachable concentrations of contaminants</p> <p>Temporary surface water drainage measures will be employed throughout the works to retain water on Site and avoid high-silt run-off from leaving the Site.</p> <p>The Site operating plan requires the Site manager to qualitatively assess visible impacts each working day; if visible issues are identified the cause will be investigated and action taken to minimise / prevent them.</p>	Medium – due to the nature of the activity	Medium – Pollution local waters bodies and associated habitats, groundwater and aquifers by particulates, nutrient enriched run-off, suspended solids, hazardous liquids or fuel	Low – the management procedures reduce the likelihood of a potential impact

<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
			Any complaints received associated with run-off will be recorded and investigated in line with the Site operating plan.			
Spillages / leaks (e.g. of fuels) associated with vehicles and plant delivering and undertaking restoration activities	Sensitive receptors R6, R7, R11, R12	Run off to surface water and groundwater	All site equipment will be well maintained to reduce the likelihood of spillages / leaks. No maintenance or refuelling will be permitted on Site. The Site operating plan requires the site manager to visually inspect vehicles and plant each working day; if visible issues are identified the cause will be investigated and action taken to minimise / prevent them. Any complaints received associated with run-off will be recorded and investigated in line with the Site operating plan.	Medium – due to the nature of the activity	Medium – Pollution of the waters (and associated habitats) by particulates, nutrient enriched run-off, suspended solids, hazardous liquids or fuel	Low – the management procedures reduce the likelihood of a potential impact
Encourage the presence of pests (scavenging birds and animals) and files	Sensitive receptors R1, R2, R3, R4	Waste carried / dropped by pests	Proposed restoration materials are inert, with negligible risk of materials that would encourage pests / files. Waste acceptance procedures will ensure that only inert materials are received / placed. Any suspect materials found will be removed from the Site within one day.	Low – due to the nature of the restoration materials	Medium / Low - health risk to workers and neighbours; nuisance risk	Negligible - due to the nature of the materials allowed for restoration and the management procedures reduce the likelihood of a potential impact

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<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
			<p>The Site operating plan requires the site manager to check for pests each working day; if any pest issues are perceived the cause will be investigated and action taken this may include engaging a specialist pest control contractor.</p> <p>Any complaints received associated with pests will be recorded and investigated in line with the Site operating plan.</p>			
Spreading mud / debris on to the public highway	<p>Sensitive receptors</p> <p>R5</p>	Tracking materials off Site via on the wheels of vehicles.	<p>Vehicle wheel washing facilities will be provided.</p> <p>The Site operating plan requires the site manager to visually check the public highway and adjacent land each working day; if any issues are perceived measures will be taken to remediate the effect and may include engaging a road sweeper.</p> <p>Any complaints received associated with mud on the public highway will be recorded and investigated in line with the Site operating plan.</p>	Medium – due to the nature of the activity	Medium – Nuisance and potential health and safety issues caused by material on the public highway	Low – the management procedures reduce the likelihood of a potential impact

<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
Litter leaving the Site boundary	Sensitive receptors R1, R2, R3, R4, R5, 7	Litter blown from the Site due to wind	Proposed restoration materials are inert, with negligible risk of materials that could become litter. Waste acceptance procedures will ensure that only inert materials are received / placed. Any suspect materials found will be removed from the Site within one day. The Site operating plan requires the site manager to check for potential litter each working day (including on adjacent land); if any litter issues are perceived the cause will be investigated and action taken. Any complaints received associated with litter will be recorded and investigated in line with the Site operating plan.	Low – due to the nature of the restoration materials	Medium – Nuisance and potential health and safety issues caused by material on the public highway	Negligible – due to the nature of the materials allowed for restoration and the management procedures reduce the likelihood of a potential impact
<i>Accidents</i>						
Vehicle and plant movements on the Site	Site users (workers and visitors)	Accidental contact between plant /	All activities and operations on the Site including plant / vehicle and pedestrian movements to be undertaken in	Low	High – injury or death	Low - the management procedures reduce

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<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
	Trespassers	vehicles and people	<p>accordance with Health and Safety Plan.</p> <p>All Site users to undertake appropriate training and instruction (i.e. site induction) before entering.</p> <p>All Site users to follow site rules (e.g. use of PPE).</p> <p>Only plant / vehicle operators with appropriate certification will be permitted to operate equipment</p> <p>Security arrangements will be in place to prevent unauthorised access to the Site</p>			the likelihood of a potential impact
Accidental spillages / leaks (e.g. of fuels) associated with vehicles and plant delivering and undertaking restoration activities	Sensitive receptors R6, R7, R11, R12	Run off to surface water or groundwater	<p>All site equipment will be well maintained to reduce the likelihood of spillages / leaks.</p> <p>No maintenance or refuelling will be permitted on Site.</p> <p>Emergency spill kits will be available in the event of a spillage.</p> <p>All operatives to be trained in emergency procedures to deal with spillages.</p>	Low	Medium – pollution of local water courses / groundwater	Low - the management procedures reduce the likelihood of a potential impact

<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
Fire impacting equipment (plant / vehicles) due to accidental ignition or arson	Sensitive receptors R1, R2, R3, R5, R6, R7	Smoke Run off to surface water or groundwater	Proposed restoration materials are inert, with negligible risk of materials that could be combustible. Emergency procedures for fire will be documented and communicated to Site users. No smoking permitted on Site. All site equipment will be well maintained. Only limited quantities of fuel will be stored on Site. Fuel will be stored in suitable / approved containers. No sources of ignition will be permitted in areas where combustible equipment / materials are stored and used. Appropriate fire-fighting equipment will be available on Site. Security arrangements will be in place to prevent unauthorised access to the Site In the event of a fire that requires the involvement of the Fire Brigade they will determine appropriate firefighting techniques.	Low – due to the nature of the activity and the materials received	Medium – nuisance from smoke and emission of particulates; detriment to local amenities; danger to life and property; disruption; pollution of local waters bodies and associated habitats, groundwater and aquifers by particles, nutrient enriched run-off, hazardous liquids or fuel.	Low –the nature of the materials allowed for restoration and the management procedures reduce the likelihood of a potential impact

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<i>Hazard</i>	<i>Receptor</i>	<i>Pathway</i>	<i>Risk Management</i>	<i>Probability</i>	<i>Consequence</i>	<i>Residual Risk</i>
<i>Discharge to groundwater</i>						
Leaching of contaminants and / or suspended solids from restoration materials into water within each working area	Sensitive receptors R11, R12	Pumped discharge of excess water from working area to groundwater recharge trench	<p>A discharge activity will be required as part of the Environmental Permit.</p> <p>Proposed restoration materials are inert, with negligible risk of significant leachable concentrations of contaminants. Furthermore, there will be the significant opportunity for dilution (e.g. precipitation / surface water run-off). There is therefore unlikely to be a significant effect on discharge quality however sampling and monitoring will be undertaken to periodically confirm this.</p> <p>Temporary surface water drainage measures will be employed throughout the works to retain water on Site as far as is possible.</p> <p>Suspended solids will be removed by using settlement ponds within the drainage system.</p> <p>The Site operating plan requires the Site manager to qualitatively assess discharge each working day; if visible issues are identified the cause will be investigated and action taken to minimise / prevent them.</p>	Medium – due to the nature of the activity (excess water is only likely to require discharge during final stages of restoration)	Medium – Pollution of local groundwater and aquifers	Low – the management procedures reduce the likelihood of a potential impact

4 References

GWP, 2019. Stability Risk Assessment EPR Permit Application - Homers Farm Quarry 190211 v.01 Final. March 2019.

Stantec, 2019a. Homers Farm inert landfill: Environmental Setting and Site Design. 60594R14. April 2019.

Stantec, 2019b. Homers Farm inert landfill: Hydrogeological Risk Assessment. 60594R16. April 2019.

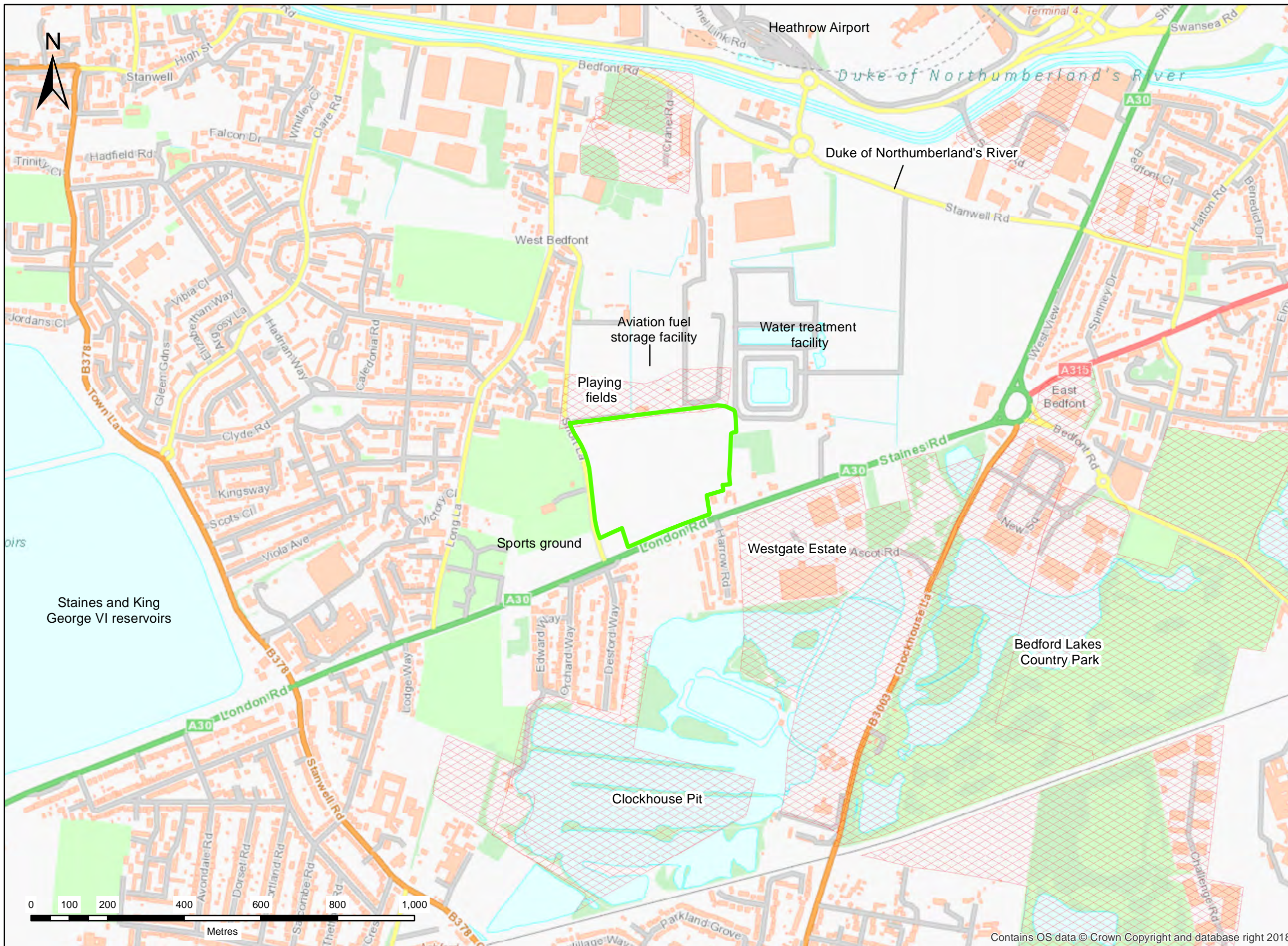
Stantec, 2019c. Homers Farm inert landfill: Gas Risk Assessment. 60594R17. April 2019.



UK Government, 2019. Risk assessments for your environmental permit. <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit#how-to-do-a-risk-assessment> Last accessed 21 February 2019.

DRAWINGS

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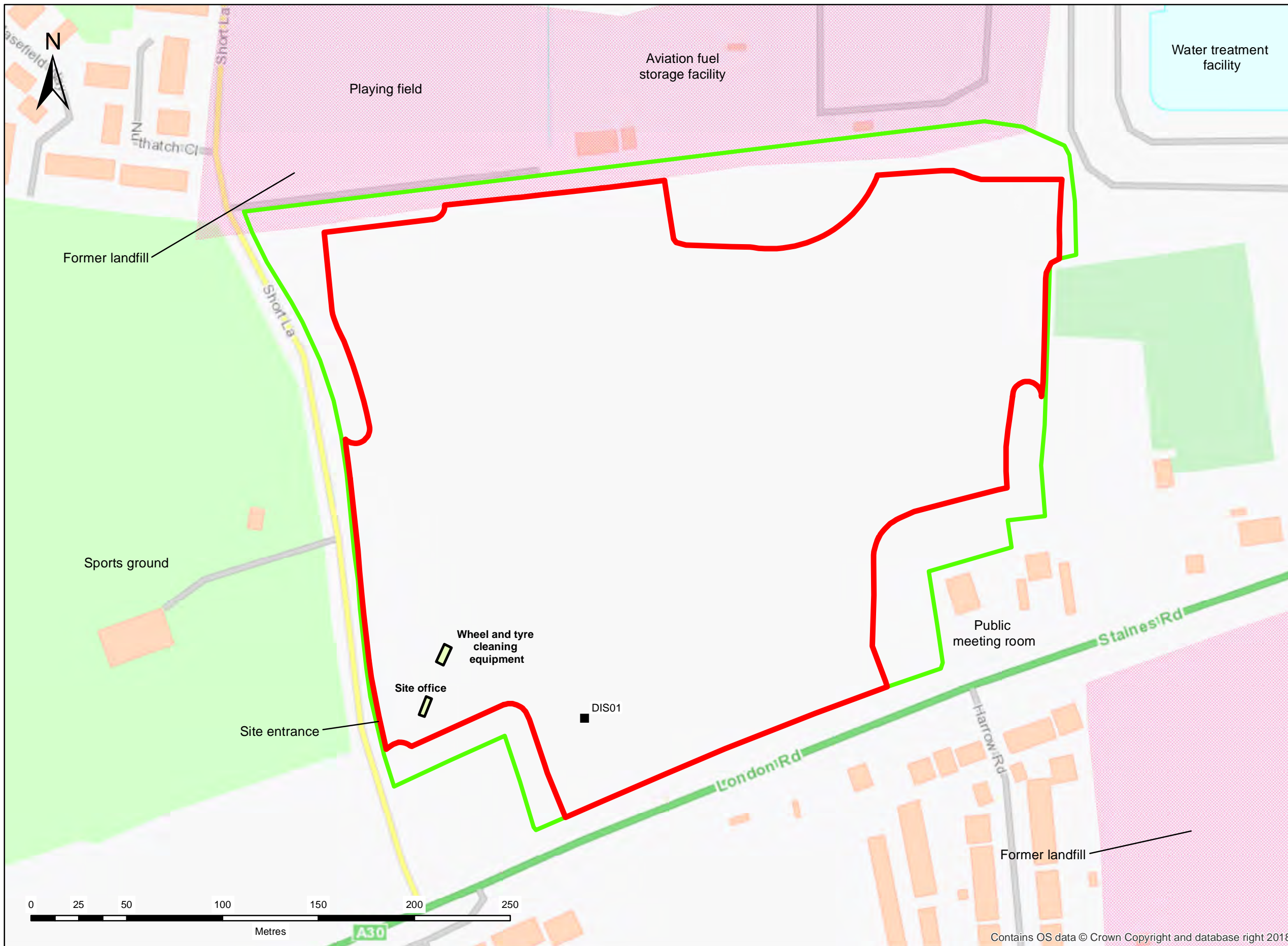
	Site boundary
	Former landfills

Drawing ESSD1
Site location

Date	Apr 2019	Drawn	RAG
Scale	1:10,000	Checked	RCS
Original	A3	Revision	1
File Reference O:\60594 Homers Farm EIA\reports\Drawings\EPI\ESSD1 - Site Location.mxd			



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- Surface water discharge point
- Environmental Permit boundary
- Site boundary

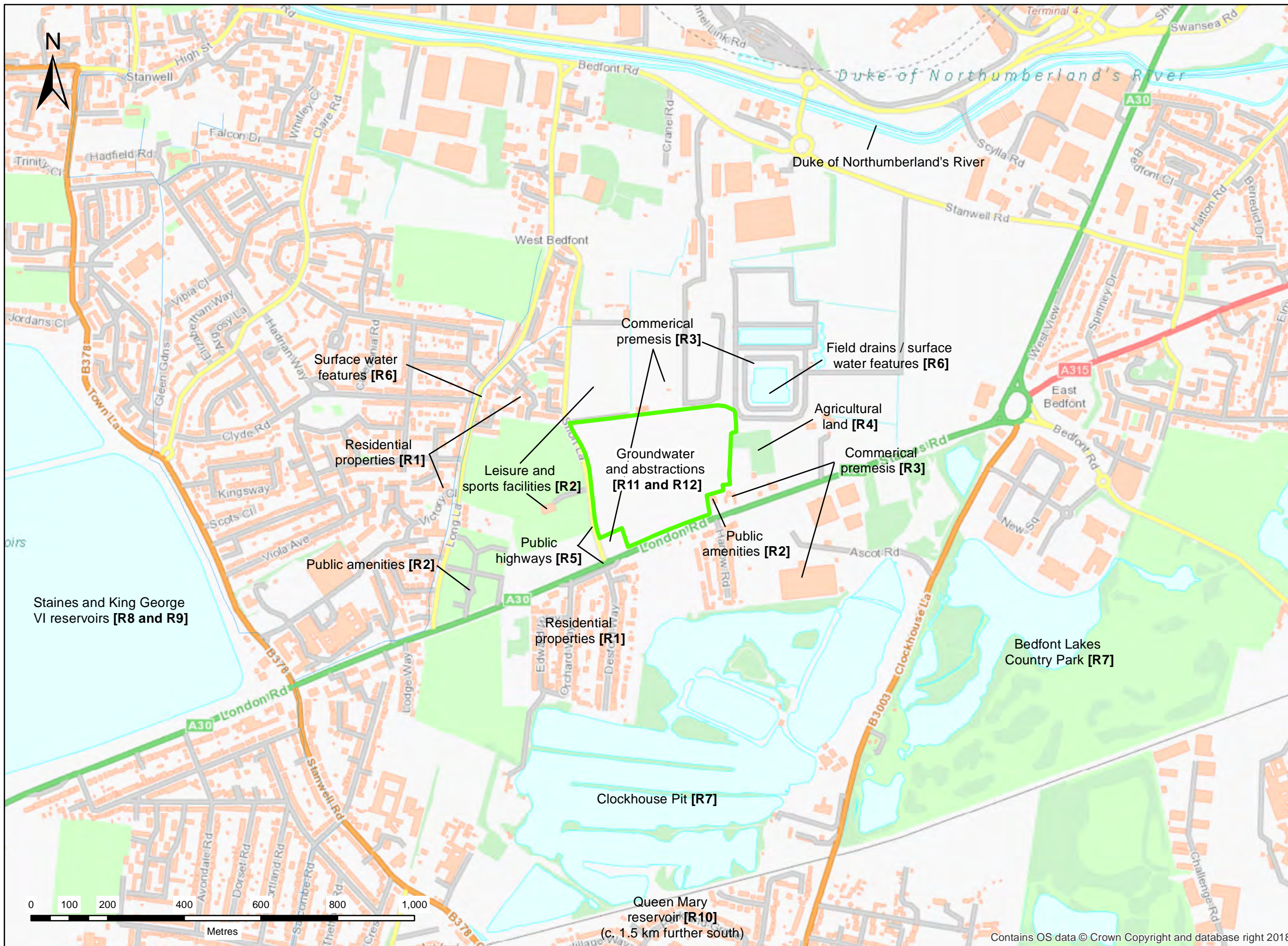
Note The location shown for the surface water discharge point is indicative; its location will be confirmed with the Environment Agency via a CQA Plan prior to construction.

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Drawing ESDD2
Site layout

Date	Jun 2019	Drawn	RAG
Scale	1:2,000	Checked	RCS
Original	A3	Revision	2
File Reference			
O:\60594 Homers Farm EIA\reports\Drawings\EPI\ESDD2 - Site layout.mxd			





Site boundary

Drawing ESSD9
Receptors

Date	Apr 2019	Drawn	RAG
Scale	1:10,000	Checked	RCS
Original	A3	Revision	1
File Reference O:\60594 Homers Farm EIA\reports\Drawings\EPI\ESSD9 - Receptors.mxd			



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APPENDICES

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Appendix A

Risk assessment definitions

Hazard A property or situation that, in particular circumstances, could lead to harm.

Probability The chance that a hazard will evolve and that the hazard will follow a pathway to a receptor:

Probability	Definition
High (H)	Will definitely occur
High/Medium (H/M)	High possibility of occurrence
Medium (M)	Likely to occur
Medium/Low (M/L)	Low possibility of occurrence
Low (L)	Very unlikely to occur

Consequence The adverse effects or impacts of a hazard being realised upon a receptor:

Consequence	Definition
High (H)	Possible irreparable damage to environmental resources and or human life
High/Medium (H/M)	Possible irreparable damage to environmental resources
Medium (M)	Possible damage to environmental resources which are limited within a regional context
Medium/Low (M/L)	Possible effects might be transient damage to environmental resources which are common place on a regional basis and alternative resources are readily available
Low (L)	The effects are negligible or might cause very slight temporary deterioration in the current environmental resource quality.

Risk A combination of the probability, or frequency, of occurrence of a defined hazard and the consequence and magnitude of impact. Risks are estimated based on the following matrix:

Matrix for the Estimation of the Risk					
	Consequence				
Probability	High	High/Medium	Medium	Medium/Low	Low
High	High	High	High/Medium	Medium	Medium
High/Medium	High	High/Medium	Medium	Medium	Medium
Medium	High/Medium	Medium	Medium	Medium	Medium/Low
Medium/Low	Medium	Medium	Medium	Medium/Low	Low
Low	Low	Low	Low	Low	Negligible