INEOS Shale

Environmental Impact Assessment Screening Report

Application to Drill a Vertical Core Well
Land adjacent to Common Road, near Harthill

PEDL 304

March 2017

Contents

1. Introduction

This report has been prepared in support of a request to Rotherham Metropolitan Borough Council (**"RMBC"**) to adopt a screening opinion to determine whether INEOS Upstream Limited's ("**INEOS**") application for a temporary planning permission to drill a vertical core well to explore for shale gas ("**Proposed Development**") on land adjacent to Common Road, located approximately 0.7 km to the east of the settlement of Harthill, Rotherham ("**site**") constitutes Environmental Impact Assessment (EIA) development. RMBC is the Mineral Planning Authority ("**MPA**") for the site.

This report reflects the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011[1] as amended (**"EIA Regulations"**) and in accordance with Regulation 5 of the EIA Regulations, this report contains:

- A plan sufficient to identify the land;
- A brief description of the nature and purpose of the development and of its possible effects on the environment; and
- Other information the applicant wishes to provide.

1.1 Requirement for EIA

In order to determine whether the Proposed Development is 'EIA development', regard must be had to the EIA Regulations and supporting Planning Practice Guidance (**"PPG"**)[2].

EIA development falls into two Schedules of the EIA Regulations. EIA is mandatory for developments listed within Schedule 1. Schedule 2 developments require EIA if they would be *"likely to have significant effects on the environment by virtue of factors such as its nature, size or location*".

In deciding whether a Schedule 2 development is EIA development, Regulation 4(6) states:

> *"Where a local planning authority … has to decide under these Regulations whether Schedule 2 development is EIA development the authority … shall take into account in making that decision such of the selection criteria set out in Schedule 3 as are relevant to the development."*

In order to allow the MPA to determine the need for EIA, this report provides a description of the site and Proposed Development, a review of the EIA screening criteria based on the EIA Regulations and the PPG, a completed EIA Screening Checklist, a site location plan in Appendix 1, and a designation plan in Appendix 2.

[1] SI 2011/1824 as amended by the Town and Country Planning (Environmental Impact Assessment) (Amendment) Regulations 2015 (No. 660)
[2] DCLG, 2015, online access: http://planningguidance.planningportal.gov.uk/blog/guidance/environmental-impact-assessment/

2. Site and Proposed Development

2.1 Site Context

2.1.1 Site Description

It is anticipated that the core well site would be under 1.5 hectares (the access track to the nearest adopted road would be in addition to this). The site location plan presented in Appendix 1 illustrates the land holding currently being considered within which the core well site would be located. The proposed site access from the public highway is also illustrated in the plan.

2.1.2 Proposed Development

The Proposed Development will comprise five phases:

Stage 1: Site Development and Establishment – approximately 3 months
Stage 2: Drilling, Coring and Testing – approximately 5 months
Stage 3: Establishment as Listening Well and Suspension – approximately 1 week with the suspended well in place until restoration
Stage 4: Undertaking Listening Well Operations – up to 3 weeks as required
Stage 5: Abandonment and Restoration – approximately 1.5 months

The overall duration of the Proposed Development would be a maximum of five years which accords with the length of INEOS' initial Petroleum Exploration and Development Licence (**"PEDL"**) term, as awarded by the Oil and Gas Authority. After five years the site will be restored to its existing condition.

Stage 1 – Site Development and Establishment

Activities during Stage 1 would include:

- **Mobilisation**: Any necessary pre-commencement surveys would be undertaken, including geotechnical surveys, site investigation surveys, road condition surveys and environmental surveys. The construction plant, including generators, site offices, welfare cabins and stores would be brought to site and site personnel would be inducted. The construction compound would be fenced for security and to delineate the proposals.

- **Access tracks**: The junction to the adopted road would be created/ improved ensuring that visibility splays provide safe access and egress from the site and any necessary passing places are installed. The access track would be lined with a geotextile membrane and covered with aggregate to prevent damage to the underlying soil during site construction and subsequent site works. An area for parking on the site would also be developed to ensure all necessary vehicles were within the site boundary.

- **Site Clearance**: The site would cover approximately 120 m x 95 m. Vegetation would be carefully removed from the site and hedges trimmed subject to any ecological considerations relating to timing and method of working. The topsoil would be removed (approximately top 300 mm) and any subsoil necessary to create a level site surface. Screening bunds would be created within the perimeter of the site (approximately 2 m high) ensuring appropriate storage of this

soil for restoration of the site and to act as visual and noise screening. The site hardstanding area (drill pad) would be constructed within the central site area.

- **Site Development and Lining**: A liner would be installed across the site and up the foot of the earth bunds. The geotextile and high density polyethylene (HDPE) liners would be laid over this area by licensed contractors to ensure an impermeable site lining, preventing any potential spills or surface water from percolating through the site floor into the underlying soil. These liners would be anchored in place, and the integrity of the liner tested. Any subsequent perforations of the liner (for example drilling of boreholes) would be heat sealed to the surrounding material (borehole casing). The liner would be covered by sub-base and aggregate to at least 450 mm below the finished site surface.

- **Development of drainage:** A perimeter water storage pipe (900 mm or similar) would be laid within a ditch at the foot of the topsoil bunds, feeding to a sump. All surface runoff from the site would therefore be retained on the site and removed by a licensed waste contractor. Drainage from the central rig bund would feed into a separate bunded tank for removal and treatment.

- **Development of site accommodation:** Cabins would be placed on the perimeter of the site, over the top of the perimeter water storage pipe trench. These would be stacked up to 2 cabins high to provide further screening as appropriate.

- **Installation of monitoring boreholes**: Groundwater monitoring boreholes would be installed towards the edge of the site, in locations and to depths to be agreed with the Environment Agency. These would be installed under permitted development rights and do not form part of this planning application.

- **Construction of Well Cellar**: A well cellar would be excavated to form a containment area from which the well would be drilled. This is constructed from a reinforced concrete ring approximately 2.5 m diameter and 3 m deep. The impermeable membrane would be incorporated into the cellar construction to maintain the integrity of the site. A conductor would be set in the top section of the well bore and cemented in place using a conductor installation rig (<10 m high) drilling with a mixture of air and water. Drill cuttings from the conductor installation would be removed from site.

- **Demobilisation**: The soil bunds would be covered with a grass seeded geotextile blanket for stability and to minimise the visual impact of the bunds, and security measures and lighting would be established around the site. Permanent lighting would be angled to light the site floor, entrance and cabins only and would be shielded and low intensity to reduce light spill. Construction equipment would then be demobilised in preparation for mobilising the main drilling rig and equipment.

Activities in Stage 1 would take place over approximately 3 months, working 0700-1900 Monday to Friday and 0700 – 1300 on Saturday, with no working on Sunday or Bank/Public Holidays unless in an emergency or agreed otherwise with the MPA.

Stage 2 – Drilling Coring and Testing

Activities during Stage 2 would include:

- **Mobilisation:** The drill rig and associated equipment including drill pipe, drill water and mud pumps would be brought to site. Temporary mobile lighting would be installed (<9 m mobile towers) to provide additional lighting to the drill floor as needed.

- **Drilling, Coring and Testing:** The well would be drilled to approximately 2,800 m using a drill rig of maximum 60 m rig height. The rig and ancillary equipment including pumps would be selected to be appropriate for the site and proposed well and to ensure that environmental impacts associated with drilling (in particular, noise levels generated) would be acceptable at the site. Cores of the target formations and sidewall cores would be removed using standard wireline coring equipment and the well would be logged during drilling. The cores would be sent from the site for tests in a laboratory to identify the geological characteristics of the core and its gas-producing properties. There will be no flow testing of the well (i.e. no gas will be flowed to surface for metering). A pressure transient test[3] (PTT) will be undertaken following the drilling, the 5 month duration for both activities assumes this activity follows immediately after the core well drilling is completed. There is potential there could be a short period after the drilling rig has been removed from site prior to the PTT starting. The purpose of the PTT is to establish the reservoir properties such as whether the target zone is over pressured (which is encouraging for shale gas extraction) or under pressured (which is less encouraging for shale gas extraction). The main rig would be removed and a workover rig of a maximum 32 m height will be brought onto site, with ancillary equipment including a cement unit. The cased well would be perforated and a packer[4] lowered into the well from the workover rig. A maximum of 10m^3 potassium chloride (salt)[5] (KCl) solution (2-4 %) would be squeezed into the formation (approximately 25cm) at the target zone at pressure. This would take a maximum of two hours. The PTT test area would be closed off using valves and pressure within the isolated area monitored for a period of up to two weeks. At the end of two weeks, the plug would be removed. A small quantity of the KCl solution within the wellbore could return to surface, and any that does return would be stored for removal by a licensed waste contractor. This process could be repeated for up to two additional target zones (making up a total testing period of up to 2 months).

- **Demobilisation:** The workover rig and ancillary equipment would be removed from site in preparation for Stage 3, and waste from the drilling and coring process (for example drill cuttings and waste drill muds) would be removed from site by a licensed contractor for treatment and disposal or reuse.

Standard well safety equipment would be present on the site during drilling, including a blow-out preventer, vent for emergency venting of gas encountered and methane monitoring. An emergency plan would be in place as well as standard pollution prevention measures including bunding, spill kits and training of staff. Operations on the site would follow Standard Rules as agreed with the Environment Agency.

[3] This test is also referred to in industry as a Diagnostic Formation Injection Test (DFIT), Leak off test, formation propagation test, formation injectability test and pressure test.

[4] A packer is a device that can be run into a wellbore with a smaller initial outside diameter that then expands externally to seal the wellbore

[5] KCl is a “sodium free” salt also used in food, fertilisers and medical applications.

All drill muds would be chosen to be appropriate for the anticipated geology and would be compliant with Environment Agency's published Waste Management Plan WMP3 and permitted by the Environment Agency in advance of use.

Activities in Stage 2 would take place over approximately 5 months. Drilling would take place over 24 hours to maintain the stability of the well and minimise the drilling period. Mobilisation and demobilisation, and routine deliveries would only take place 0700-1900 Monday to Friday and 0700 – 1300 on Saturday, with no working on Sunday or Bank/Public Holidays unless in an emergency or agreed otherwise with the MPA. During PTT, works will only take place during 0700-1900 Monday to Friday and 0700 – 1300 on Saturday with no working on Sunday or Bank/Public Holidays unless in an emergency or agreed otherwise with the MPA.

Stage 3 – Establishment as Listening Well and Suspension

During Stage 2, running and cementing the reservoir casing to surface is completed using the drilling rig (this would take 2-3 days). In order to suspend the well, in advance of listening well activities, a flange and well monitoring pressure gauge would be fitted to the well and it would be sealed using a wellhead Christmas tree, or wireline blow out preventer. A steel protector cage (approximately 2 m x 2 m x 2 m) would be fitted over the wellhead. The remaining site cabins would be removed from site.

Once the suspended well is in place, routine visits to the site would be made to maintain and check the site. These checks would include:

- Integrity of pipework and site surface:
- Integrity of fencing and security arrangements;
- Site drainage and containment, including tanks; and
- Wellhead structure and pressure monitoring.

The site would be unmanned once the well is suspended, but site security including CCTV would remain. If for any reason maintenance of the well is required during the suspension period the workover rig (max 32m) may be brought on site if necessary.. Such work over activities would not normally exceed a month period and would be agreed with the Mineral Planning Authority in advance.

Activities to suspend the well (once the rig is removed from site) and maintenance visits would take place 0700-1900 Monday to Friday and 0700 – 1300 on Saturday, with no working on Sunday or Bank/Public Holidays, unless in an emergency or agreed otherwise with the MPA.

Stage 4 – Undertaking Listening Well Operations

Activities during Stage 4 would only take place to undertake baseline monitoring or when another well is hydraulically fractured, subject to such a consent for that separate activity being granted within the period of planning consent for this well. Activities would include:

- Mobilisation of wireline truck, 30 tonne mobile crane (approximate 35 m maximum height), mast, elevated work platform and temporary welfare facilities.
- Placement of a string of geophones (small seismic receivers) run on wireline inside the reservoir casing for the duration of the listening operations
- Demobilisation

Stage 4 operations would last for a maximum of 3 weeks and would result in no perceptible noise or vibration at the nearest receptors. There would be no introduction of

any chemicals into the well, or requirement to re-work the well using a rig. Operations would take place 0700-1900 Monday to Friday with no working on Saturday, Sunday or Bank/Public Holidays, unless in an emergency or agreed otherwise with the MPA.

Stage 5 - Abandonment and Restoration

Activities during Stage 5 would include:

- **Plugging and Abandoning the Well**: Decommissioning of the well would be undertaken in accordance with Oil and Gas UK Guidelines on Well Abandonment and according to an abandonment plan to be agreed with the Environment Agency, Health and Safety Executive (HSE) and an independent Well Examiner. The wellhead would be removed and casing/ cement cut to 3 m below ground level to allow restoration of the site to agriculture. The 32 m (max) workover rig would be required during well abandonment for a short period during the 1 month abandonment and restoration stage.

- **Removal of Residual Site Equipment and Site Surfacing**: The site would be fenced with temporary Heras fencing to allow the permanent fencing and security fencing to be removed. The concrete pad and cellar would be broken for removal by a licensed waste contractor, and aggregate, drainage pipework and other infrastructure would be removed from the surface and reused where permitted. Any potentially contaminated equipment would be removed from the site prior to removal of the impermeable geotextile/ HDPE lining. All site equipment and infrastructure would be reused or recycled where possible, or alternatively removed from site by licensed waste contractors as appropriate.

- **Restoration of Ground:** The soils stored in bunds would be used to level and restore the site surface. Field drainage would be re-developed if required. The site would be reseeded and prepared for aftercare as agricultural land. Access tracks and road amendments (junction amendments or passing place improvements) would also be restored as agreed with the landowner and Highways Authority, or retained for continued use, subject to any necessary further planning consent.

- **Aftercare:** An aftercare plan would be put in place as a condition of planning consent, to ensure appropriate aftercare of the site as agricultural land.

Activities in Stage 5 would last approximately 1.5 months and take place 0700-1900 Monday to Friday and 0700-1300 on Saturday, with no working on Sunday or Bank/Public Holidays unless in an emergency or agreed otherwise with the MPA. Aftercare would take place within the landowner's existing management schedule.

3. Screening Assessment

3.1 Introduction

The following should be considered in determining whether the Proposed Development constitutes EIA development:

- If the Proposed Development is of a type listed in Schedule 1;
- If not, whether:
  - it is listed in Schedule 2; and
  - any part of it is located within a sensitive area; or
  - it meets any of the relevant thresholds and criteria set out in Schedule 2; and / or
  - it would be likely to have significant effects on the environment.

These points are explored further in this section with reference to the EIA Regulations and supporting PPG.

3.2 Schedule 1 Projects

EIA is mandatory for projects listed in Schedule 1 of the EIA Regulations. Schedule 1 developments are large scale projects for which significant effects would be expected and comprise developments such as new airports and power stations.

In respect of the Proposed Development, Schedule 1, Paragraph 14 would only apply where "*Extraction of natural gas … for commercial purposes where the amount extracted exceeds 500,000 cubic metres per day in the case of gas …"*

The Proposed Development would not involve gas extraction and is therefore not of a type listed in Schedule 1.

3.3 Schedule 2 Projects

The development proposed is of a type listed in Schedule 2 development which depends on the location of the development (i.e. if it is within a sensitive area) and/or whether it meets any of the relevant thresholds or criteria in Column 2.
Sensitive Areas are defined in the EIA Regulations as:

- Sites of Special Scientific Interest (SSSI) and European Sites;
- National Parks, the Broads, and Areas of Outstanding Natural Beauty; and
- World Heritage Sites and Scheduled Monuments.

In certain cases, local designations which are not included in the definition of sensitive areas, but which are nonetheless environmentally sensitive, may also be relevant in determining whether an assessment is required. Furthermore, in considering the sensitivity of a particular location, regard should also be had to whether any national or internationally agreed environmental standards (e.g. air quality) are already being approached or exceeded.

The Proposed Development falls under Column 1 of Category 2, 'Extractive Industry', of Schedule 2 of the EIA Regulations of which sub-paragraphs 2(d) 'deep drillings' or 2(e) 'surface industrial installations for the extraction of … natural gas' are relevant.

The Proposed Development site is not located in a sensitive area and therefore the thresholds set out next to the relevant sub-paragraph under Column 1, Category 2, Schedule 2 of the EIA Regulations should be applied.

The threshold for a 'deep drilling' is likely to be an area exceeding 1 ha whilst the threshold for a 'surface industrial installation' is an area exceeding 0.5 ha. The Proposed Development covers an area of more than 1 ha, including the access track and so exceeds both thresholds. However, it is below the indicative criteria and threshold of this type of development as set out in the PPG (see Section 3.6).

Therefore, when considering whether the Proposed Development is EIA development, the MPA must consider the selection criteria set out at Schedule 3 of the EIA Regulations.

3.4 Schedule 3

Schedule 3 of the EIA Regulations set out selection criteria which relate to specific matters, including: the characteristics of the development; the location of the development; and the characteristics of the potential impact. These factors should be taken into account as part of the screening process and are set out below:

3.4.1 Characteristics

- The size of the development;
- The cumulation with other development;
- The use of natural resources;
- The production of waste;
- Pollution and nuisances; and
- The risk of accidents, with specific regard to substances or technologies used.

3.4.2 Location

- The existing land use;
- The relative abundance, quality and regenerative capacity of natural resources in the area; and
- The absorption capacity of the natural environment.

3.4.3 Potential Impact

- The extent of the impact (geographical area and size of the affected population);
- The transfrontier nature of the impact;
- The magnitude and complexity of the impact;
- The probability of the impact; and
- The duration, frequency and reversibility of the impact.

3.5 Consideration of Cumulative Effects

The EIA Regulations require consideration of a proposed development cumulatively with other development. Guidance contained in the PPG regarding EIA Screening includes the topic '*When should Cumulative Effects be Assessed*?'[6] This states that:

> *"each application (or request for a screening opinion) should be considered on its own merits. There are occasions where other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development."*

With regard to this proposal, no potentially cumulative schemes have been identified. INEOS proposes to seek planning consent for other similar vertical core well sites within its PEDL areas in the East Midlands. Applications for each site would be assessed on their own merits, against the relevant development plan and other material considerations. INEOS has a current vertical core well exploration site (in excess of 10km) within Derbyshire Mineral Planning Authority's area that is being progressed to a planning application. This will not result in cumulative effects with this proposed site. This is due to the distance from the current site, meaning, for example, receptors would not be affected by noise from two different sites, and the same local road network would not be impacted by vehicles accessing two different sites. Screening for future sites would be required to take the same considerations into account, having regard for the future baseline in the area.

3.6 Planning Practice Guidance

Paragraphs 057 and 058 of PPG provide guidance to help determine whether significant effects are likely. In general, the more environmentally sensitive the location, the lower the threshold will be at which significant effects are likely. Table 1 sets out indicative criteria and thresholds identified in the PPG along with some of the issues that are most likely to need to be considered in determining whether a development is likely to be EIA development.

[6] Paragraph: 024 Reference ID: 4-024-20140306

Table 1: Planning Practice Guidance Indicative Screening Criteria

Development type	Indicative criteria and threshold	Key issues to consider
(d) Deep drilling, in particular: (i) geothermal drilling; (ii) drilling for the storage of nuclear waste material; (iii) drilling for water supplies; with the exception of drilling for investigating the stability of the soil.	Drilling operations involving development of a surface site of more than five hectares (ha).	Regard should be had to the likely wider impacts on surrounding hydrology and ecology.
(e) Surface industrial installations for the extraction of coal, petroleum, natural gas and ores, as well as bituminous shale.	Development of a site of 10 ha or more or where production is expected to be more than 100,000 tonnes of petroleum per year.	Scale of development, emissions to air, discharges to water, the risk of accident and the arrangements for transporting the fuel.

3.7 Review of Screening Criteria

Table 2 sets out a review of all of the above criteria and requirements and specifically addresses the Proposed Development at the site.

Table 2: Screening Assessment for Proposed Development at PEDL304 Land adjacent to Common Road, near Harthill

SCREENING CRITERIA	PROPOSED DEVELOPMENT
1. CHARACTERISTICS OF THE DEVELOPMENT	
(a) Size of the development	
Will the development be out of scale with the existing environment?	The Proposed Development is temporary and covers a site of approximately 1 - 2ha. The site is located on intensively managed agricultural land. Throughout the 5 year period there will be short durations where the drilling and work over rigs and cranes (worst case being the <60 m mast height drilling rig on site for approximately 3 months). With the exception of these temporary periods, no feature of the proposals would be unusual or prominent within an agricultural landscape.
Will it lead to further consequential development or works?	No. The Proposed Development would be a discrete proposal and includes all necessary works, including access. The proposal will include provisions for restoration back to the current use.
(b) Accumulation with other development	
Are there potential cumulative impacts with other existing development or development not yet begun but for which planning permission exists?	No potentially cumulative schemes have been identified.
Should the application for this development be regarded as an integral part of a more substantial project? If so, can related developments which are subject to separate applications proceed independently?	No. The Proposed Development would be a discrete proposal and could proceed independently. Other similar proposals for vertical core wells are and will be brought forward for planning applications across the East Midlands. However, these are all independent, discrete projects and would be assessed on their own merits.
(c) Use of natural resources	
Will construction or operation of the development use natural resources such as land, water, material or energy, especially any resources which are non-renewable or in short supply?	Landtake would be approximately 1 to 2 ha of agricultural land. This would be restored to agricultural use and current agricultural land quality at the end of the proposed activities. Minor volumes of water would be required for site construction (e.g. laying foundations) and sanitary purposes. The drilling and PTT activities would use approximately 330 cubic metres (m^3) of water. Water would be brought to the site as required by road tankers. The construction of the site would require approximately 9,000 tonnes of aggregate to be brought to site by road. This would be removed upon restoration and reused where permitted. On-site energy needs would be met through mobile diesel generators.
(d) Production of waste	
Will the development produce wastes during construction or operation or decommissioning?	Wastes from the proposals would include waste water and materials associated with drilling. Drilling mud and rock cuttings would be collected in tanks which would be located on the concrete pad and transported from the site by road for disposal at an authorised waste disposal facility. All waste water, including surface water, would be contained on-site and removed by tanker. Clean surface water will be collected separately from waste water and if it is appropriate for use within the site operations this will be done. All extractive wastes produced at the site will be managed under the Environment Agency's

SCREENING CRITERIA	PROPOSED DEVELOPMENT
	published Waste Management Plan WMP3. Given that this development is for a core well without any well stimulation the production of naturally occurring radioactive material (NORM) is not expected.
(e) Pollution and nuisances	
Will the development release any pollutants or any hazardous, toxic or noxious substances to air?	On-site generators and the drilling rig (both diesel powered) would produce temporary, localised emissions to air, likely to include NOx, SOx, PM10 and 2.5, CO and VOCs. Generators would be sized appropriately for site energy requirements and would be efficient, with emissions reduced as far as possible. These would be similar to generators on construction sites. Emissions from the rig would also be reduced through choice of an efficient rig appropriate for the site, with minimal emissions. Generators would be present on the site for approximately 6 months at any one time. The drilling rig will be on site for less than 3 months would be the longest duration a rig is on site. Road traffic associated with the Proposed Development would also produce emissions to air during the temporary construction and drilling phases, similar to any construction site. There would be no operational flaring or venting during the proposed activities. The scale of the proposed activities is such that significant effects to air quality are not anticipated. There are no Air Quality Management Areas in the vicinity of the site.
Is there a potential risk from leachates or escape of wastes of other products/by-products that may constitute a contaminant in the environment?	Wastes from the Proposed Development would include waste water and materials associated with the drilling and pressure transient test. Surface water would be retained within the site surface water drainage network and disposed of off-site by a licensed waste contractor. Drilling and PTT waste would be stored in bunded tanks on site and disposed of by licensed waste contractors. Drilling mud and rock cuttings would be collected in tanks located on the concrete pad and transported from the site by road for disposal at an authorised waste disposal facility. It is anticipated that operations would be permitted under Standard Rules Permit (SR2015 No1) for a mining waste operation (the management of extractive wastes) specifically with regard to ground, groundwater and surface water protection. All extractive wastes produced at the site will be managed under the Environment Agency's published Waste Management Plan WMP3. Given that this development is for a core well without any well stimulation the production of naturally occurring radioactive material (NORM) is not expected.
Will the development cause noise and vibration or release of light, heat, energy or electromagnetic radiation?	Noise during the construction and drilling phases would be temporary. An Environmental Report including a noise appraisal will be completed as part of the planning application. This will include detailed noise modelling using SoundPLAN software. The noise assessment will demonstrate accordance with the following assessment criteria: • During the site development and establishment stage the site will achieve a 65dB LAeq criteria for construction noise (as a category A project under British Standard 5228: 2009 +A1:2014 "code of practice for noise and vibration control on construction and open sites"). This will be achieved through the application of best practice noise control during construction.

SCREENING CRITERIA	PROPOSED DEVELOPMENT
	• During the 24 hour drilling and coring operations, the site will accord with the daytime, evening and night time noise thresholds set out in Planning Practice Guidance (PPG) on Noise from Mineral Extraction. The night time noise of the project, which is considered likely to be the lowest threshold to be met, will not exceed 42dB(A) LAeq,1h (free field). The daytime and evening baseline plus 10dB(A) threshold will be targeted and the project will not exceed the regulatory limit of 55dB(A) LAeq, 1h (free field). Should the modelling identify effects above the criteria set out in the PPG, additional mitigation will be identified and incorporated into the design of the proposals submitted for planning. Options available for mitigation include the following: • maximising the site layout to reduce noise impacts including the orientation and height of cabins and bunds; • orientating noise equipment away from receptors; • specification of low noise equipment (e.g. generators); • enclosing equipment to minimise noise emissions at source (e.g. enclosing drilling mud pumps); and • additional screening around the site boundary INEOS recognise and expect that the planning application submitted will show how the proposals can achieve the PPG criteria, taking in to account embedded mitigation. INEOS will be targeting the lowest noise emissions that achieve compliance whether it is daytime, evening or night time. Based on industry precedent and current understanding of the site, INEOS is confident that the development will meet the regulatory thresholds and therefore have no significant noise impacts. Groundborne vibration is expected to be imperceptible at distances of greater than 20 m from the drill rig. The closest residential properties are over 690 m from the proposed site and access track. Ground-borne vibration at these receptors would be considerably lower and certainly not perceptible. Lighting would be required in the site and on the rig. All lighting would be carefully directionally controlled to limit environmental effects. No significant effects are anticipated. Lighting would be designed carefully in accordance with relevant British Standards and Institute of Lighting Professionals (ILP) (2011) Guidance Notes for the Reduction of Obtrusive Light.
Will the development lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal waters or the sea?	There are no anticipated significant effects. The wellsite and any new access track will be lined using a geomembrane. This will prevent potential groundwater pollution from spillages and the handling of drilling fluids and cuttings. The site will be constructed using a central rig bund drainage system which will be segregated from the remainder of the site to prevent potential contamination of the surrounding surfaces in the event of a spillage. Following the drilling operations, the aggregate and concrete would be fully removed from the site before the impermeable liner is removed.
(f) Risk of accidents, having regard in particular to substances or technologies used	
Will there be a risk of accidents during construction or	A risk of accidents exists however standard safety measures would be implemented. The health

SCREENING CRITERIA	PROPOSED DEVELOPMENT
operation of the development which would have effects on people or the environment?	and safety risks of the proposals would be managed as required by the Borehole Sites & Regulations 1995, the Management of Health & Safety at Work Regulations 1992, the Construction (Design & Management) Regulations 2007, the Offshore Installations & Wells (Design & Construction etc.) Regulations 1996 and the Applicant's HSE Management System.
Will the development involve use, storage, transport, handling or production of substances or materials which could be harmful to people or the environment (flora, fauna, water supplies)?	All chemicals, fuels and waste products from the proposals would be stored on site in suitable containers in accordance with regulations and best practice. All chemicals for use in the well would be compliant with the conditions of the Environment Agency's published Waste Management Plan WMP3 and permitted by the Environment Agency for this Proposed Development. Fuels for the on-site generators and rig would be stored in dedicated areas in bunded tanks, and fuelling would be undertaken by competent staff in areas with appropriate bunding in case of drips or spills. Spill kits would be in place. Waste would be disposed of in appropriately licenced waste facilities. Significant effects are not anticipated.
Other characteristics	
Potential physical changes (topography, land use, changes in water bodies etc.) from construction, operation or decommissioning of the development?	No significant physical changes are anticipated. The Proposed Development includes a programme of restoration and aftercare to return the site to its pre-development condition.
2. LOCATION OF THE DEVELOPMENT	
(a) Existing land use	
Are there existing land uses on or around the location which could be affected by the development, e.g. residential, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying?	The site is adjacent to an area of woodland. Agricultural land, woodland and residential properties and villages are located in the wider areas surrounding the site. Harthill Footpath No 23 runs to the immediate east of the site, and Harthill Footpath No 8 runs close to the site, to the north. From public domain documents and maps available from the Coal Authority, coal mining activity is known to have taken place in the subsurface of the site. Mine abandonment plans have been obtained from the Coal Authority to chart the extent of known and probable mining in the vicinity of the proposed well site and to ensure safe interaction with coal seams and abandoned mine workings. The Coal Authority regulates and ensures safe interaction with coal resource and abandoned coal workings. Prior to drilling the well, INEOS is required to liaise with the Coal Authority (amongst other regulators) and all operations will be carried out under a Deep Energy Access Agreement issued by the Authority.
Is the development located in a previously undeveloped area where there will be loss of greenfield land?	There would be no permanent loss of greenfield land associated with the development. The Proposed Development is temporary and includes a programme of restoration and aftercare.

SCREENING CRITERIA	PROPOSED DEVELOPMENT
(b) Relative abundance, quality and regenerative capacity of natural resources in the area	
Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the development? • groundwater resources • surface waters • forestry • agriculture • fisheries • tourism • minerals	The site is not located within a groundwater Source Protection Zone. The nearest surface watercourses (two surface water drainage ditches) are located over 480 m to the southwest and to the south of the site. There is also a groundwater well located over 460 m to the west of the site. There are no statutory ecological designations within or adjacent to the site. Loscar Common Plantations, adjacent to the east and south of the site, and Loscar Wood, 500 m to the east, are areas of 'known interest outside protected sites'. The nearest statutory designations to the site are two SSSI: Ginny Spring Whitwell Wood and Crabtree Wood, located approximately 1.8 km southeast and 2.2 km southwest of the site respectively. Two further SSSI are located over 3.5 km to the northeast of the site: Anston Stones Wood (also a Local Nature Reserve) and Lindrick Golf Course. The surrounding area includes woodland and agriculture although the Proposed Development would not affect these activities.
(c) Absorption capacity of the natural environment	
Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the development?	There are no statutory ecological designations within or adjacent to the site. Loscar Common Plantations, adjacent to the east and south of the site, and Loscar Wood, 500 m to the east, are areas of 'known interest outside protected sites'. The nearest statutory designations to the site are two SSSI, Ginny Spring Whitwell Wood and Crabtree Wood, located approximately 1.8 km southeast and 2.2 km southwest of the site respectively. Two further SSSI are located over 3.5 km to the northeast of the site: Anston Stones Wood (also a Local Nature Reserve) and Lindrick Golf Course. The site is within the Impact Risk Zones (IRZ's) for these same two SSSI, Ginny Spring Whitwell Wood and Crabtree Wood. In accordance with the Natural England Guidance Document (SSSI Impact Risk Zones User Guidance, March 2016) a review of the project against the 'reasons for concern' for Oil and Gas exploration projects has been undertaken. It is considered that the proposed development parameters as described within this document do not present a risk of significant impacts in relation to the defined 'reasons for concern'.. The nearest historic or cultural heritage features are Grade II listed buildings located over 1 km west of the site along Union Street in Harthill. The closest of these is Walker's Butchers/Threshing Barn. A number of Grade II listed buildings are also located over 1.5 km to the northeast of the site in the village of Thorpe Salvin (including 7 and 9 Worksop Road and the Church of St Peter). The Harthill Conservation Area is approximately 1 km to the west of the site and the Thorpe Salvin Conservation Area is approximately 1.5 km to the northeast of the site. No Scheduled Monuments are located within 1 km of the site; the closest is Thorpe Salvin Hall, located over 1.6 km to the northeast, which is also Grade II listed. The Proposed Development has been designed with regard for these nearby sensitivities. The location of the site has been chosen to allow screening of receptors by vegetation and landform, with distance also minimising impacts to the setting of cultural heritage receptors. Ecological receptors would be protected by the pollution prevention measures built into the site, as well as the

SCREENING CRITERIA	PROPOSED DEVELOPMENT
	temporary nature of the Proposed Development. There would be no requirement for felling of trees or hedges to create the site, so there would be no direct loss of any features which may be used by populations within the designated areas. There may need to be some hedgerow removal in order to gain site access. This will be managed to avoid impacts on breeding birds. The drilling rig would be up to 60 m high, with the workover rig and crane being up to 32m and 35 m high respectively. However, these would only be in place for a temporary period and would be screened by the surrounding landform. Therefore there is not anticipated to be a significant impact on setting of ecological, landscape or cultural heritage features.
Are there any other areas on or around the location which are important or sensitive for reasons of: • wetlands; • coastal zones; • mountains and forest areas; • nature reserves and parks; • Special Protection Areas and Special Areas of Conservation; • Areas in which environmental quality standards laid down in EU legislation have already been exceeded; • Densely populated areas; • Landscapes of historical, cultural or archaeological significance.	See 2 (c) *Absorption capacity of the natural environment* above.
Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected?	There are no ecological designations on or directly adjacent to the site. The site is intensively managed for agricultural purposes and any features of biodiversity interest are likely to be located at field edges. Loscar Common Plantations to the east and south of the site are 'areas of known interest outside protected sites'. The site location has been offset from these features and detailed design of the site layout will seek to minimise light spill into the woodland. An Environmental Report, containing an ecological assessment will be submitted with the planning application.
Are there any inland, coastal, marine or underground waters on or around the location which could be affected?	The site is not located within a groundwater Source Protection Zone. The nearest surface watercourses (two surface water drainage ditches) are located over 480 m to the southwest and to the south of the site. There is also a groundwater well located over 460 m to the west of the site.
Are there any groundwater source protection zones or areas that contribute to the recharge of groundwater resources?	The site is not located within a groundwater Source Protection Zone.
Are there any areas or features of high landscape or scenic value on or around the location which could be affected?	The site falls within an Area of High Landscape Value. However, no significant effects on views are anticipated. The drilling rig could be up to 60 m high and the work over rig and crane would be up to 32 m and 35 m respectively. However this would only be in place for short temporary periods. Some screening will be provided by bunds (and cabins during drilling) at the site boundary. An Environmental Report including a landscape and visual appraisal will be completed as part of the planning application.

SCREENING CRITERIA	PROPOSED DEVELOPMENT
Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected?	An existing public footpath (Harthill 23) is situated to the east of the site, alongside the neighbouring woodland area. This footpath continues in to the north of the site (joining Harthill 8), leading west to Harthill, and to the east/southeast of the site towards Packman Lane. Impacts on the users of the Public Right of Way (PROW) (i.e. their amenity) would be reduced by the bunds at the site boundary and managed through standard procedures and possibly a diversion (subject to appropriate permits). The closest road to the site is Common Road which would be used to access the site. Vehicle movements to and from the site would include deliveries of water, cement, drilling materials and other supplies, and removal of fluids generated and waste for disposal. These transport movements would be made during the working day with all but essential deliveries being made during daylight hours. Only in exceptional circumstances which were operational or health and safety led, would deliveries be made at night. A Traffic Management Plan (TMP) will be prepared that will route vehicles along the most appropriate local roads so as to avoid more sensitive receptors wherever possible. Staff would be transported to site by a minibus to minimise private car use to site. During construction (Stage 1) for approximately half of the stage there would be fewer than 10 HGV (vehicles >7.5 tonnes) movements per day, equating to 5 HGVs entering and leaving the site. On up to 40 days there would be more than 10 HGV movements, including a short period of time (approximately 3 weeks) with between 50 and 60 movements per day (5 per hour over a 12 hour day) when aggregate is brought to surface the site. During drilling, coring and PTT (Stage 2), or if a workover is required, again there would be fewer than 10 daily HGV movements for approximately half of the period, with periods of between 10 and 42 HGV movements daily (2-4 per hour over a 12 hour day) to allow for mobilisation and demobilisation of drilling and testing equipment or the workover rig. Over the course of the drilling, coring and pressure transient test there could be up to 38 movements of vehicles >32 tonnes as rigs are mobilised and demobilised. There would be no more than 6 of these movements daily. Stages 3 to 5 would have less associated traffic movements.
Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected?	As above. The relatively low levels of traffic generated, short term nature of the most intensive activities and existence of a TMP, which is likely to include measures such as escort vehicles and traffic management personnel to facilitate the unimpeded movement of vehicles to the site. The TMP would reduce the risk to nearby routes using known and understood traffic management techniques.
Is the development in a location where it is likely to be highly visible to many people?	Significant effects on views are not anticipated. The drilling rig would be the most visible element during the proposed development at up to 60 m high. However this, like the smaller work over rig (32 m) and 30 t crane (35 m), would only be in place for a temporary period. The bunds around the site will limit views of the site. An Environmental Report including a landscape and visual appraisal will be completed as part of the planning application.

SCREENING CRITERIA	PROPOSED DEVELOPMENT
Are there any areas or features of historic or cultural importance on or around the location which could be affected?	The nearest historic or cultural heritage features are a number of Grade II listed buildings over 1 km west of the site (see above). The Harthill Conservation Area is approximately 1 km to the west of the site and the Thorpe Salvin Conservation Area is approximately 1.5 km to the northeast of the site. Although direct effects would not occur there is still the potential for the setting of such assets to be affected (albeit temporarily) with implications for the significance of the asset. There are not expected to be significant effects on the setting of these features. The drilling rig would be up to 60 m high; however this would only be in place for a temporary period. The short lived nature of the impact, distance and limited intervisibility with key heritage assets means significant effects are not considered likely. An Environmental Report, including a cultural heritage appraisal and landscape and visual appraisal, will be completed as part of the planning application.
Are there any areas on or around the location which are densely populated or built up, which could be affected?	The site is not located within an urban or densely populated area.
Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected?	There are no Air Quality Management Areas on or adjacent to the site.
Is the location of the development susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the development to present environmental problems?	According to the Environment Agency website, the site does not lie within a flood plain. Appropriate consideration of flooding and drainage will be completed as part of the planning application. The site is not considered susceptible to any other hazards.
3. CHARACTERISTICS OF THE POTENTIAL IMPACT	
(a) Extent of the impact	
Will the effect extend over a large area?	No. This is confined to the site area (under 1.5 ha) and the land immediately adjoining.
Will many people be affected?	No. The nearest residential properties are over 690 m from the site. The site is approximately 0.7 km from the nearest settlement of Harthill.
(b) Transboundary nature of the impact	
Will there be any potential for transboundary impact? (n.b. Development which has a significant effect on the environment in another Member State is likely to be very rare. It is for the Secretary of State to check Environmental Statements to decide whether there is likely to be such an effect in each case).	No.
(c) Magnitude and complexity of the impact	
Will there be a large change in environmental conditions?	No.
Will the effect be unusual in the area or particularly complex?	No.
Will many receptors other than people (fauna and flora,	This is considered to be unlikely as the site is relatively isolated and is currently intensively

SCREENING CRITERIA	PROPOSED DEVELOPMENT
businesses, facilities) be affected?	managed for agricultural purposes. An Environmental Report containing assessments of potential impacts on noise, traffic and transport, ecology, landscape and visual, surface water and flooding, hydrogeology and archaeology and cultural heritage will be submitted with the planning application.
Will valuable or scarce features or resources be affected?	No.
Is there a risk that environmental standards will be breached?	The proposals would be managed in accordance with the Borehole Sites & Regulations 1995, the Management of Health & Safety at Work Regulations 1992, the Construction (Design & Management) Regulations 2007, the Offshore Installations & Wells (Design & Construction etc.) Regulations 1996, and other relevant legislation. Environment Agency guidance for onshore oil and gas development (August 2016) will also be followed in relation to environmental permitting. The proposed core well will be undertaken in accordance with Standard Rules (SR 2015 No 1) for management of extractive waste, not including a waste facility, generated from onshore oil and gas prospecting activities including drilling, coring, PTT, acid wash and decommissioning for the production of oil or gas (using oil and water based drilling mud).
Is there a risk that protected sites, areas, and features will be affected?	This is considered to be unlikely for the proposed development and site location. An Environmental Report containing assessments of potential impacts on noise, traffic and transport, ecology, landscape and visual, surface water and flooding, hydrogeology and archaeology and cultural heritage will be submitted with the planning application.
(d) Probability of the impact	
Is there a high probability of the effect occurring?	The effects of the Proposed Development can be clearly established and the probability of any effects determined with reasonable confidence. In addition, there are established and embedded mitigation and management techniques which will be used during the core well activities to reduce the probability of effects occurring. As with all development, It is likely that some environmental effects will occur, though the nature, duration and scale will be limited as described herein.
Is there a low probability of a potentially highly significant effect?	As above.
(e) Duration, frequency and reversibility of the impact	
Will the effect continue for a long time?	Consent for the Proposed Development is sought for five years. However construction (Stage 1) would last a maximum of 3 months and drilling (Stage 2) works, with the potential environmental impact would last a maximum of five months. For the majority of the five year term, the well would be suspended (Stage 3) with only maintenance checks carried out.
Will the effect be permanent rather than temporary?	Both construction and drilling operations would be temporary and end following the cessation of Stage 2.
Will the impact be continuous rather than intermittent?	Intermittent. Construction and drilling activities would be undertaken over periods of up to 3 and 5months respectively. It is intended that drilling will follow shortly after site construction; however this depends on rig availability. There could also be intermittent periods where a work over rig is required on site (e.g. for maintenance or during site abandonment). These would be for less than 1 month,
If intermittent, will it be frequent rather than rare?	Rare.
Will the impact be irreversible?	No.
Will it be difficult to avoid or reduce or repair or compensate for the effect?	No.

4. Conclusion

This screening assessment has considered whether the Proposed Development is likely to give rise to significant effects on the environment.

The Proposed Development falls under Schedule 2 of the EIA Regulations as the site exceeds the legislative area thresholds. However, it does not exceed indicative thresholds and criteria within the PPG and is not located in a sensitive area as defined by the EIA Regulations.

Table 2 sets out the baseline environmental conditions in the area on and adjacent to the site. The potential exists for effects on ground and surface water, air quality, views and noise however the site is located in an agricultural area with few adjacent sensitive receptors and therefore the potential for significant effects is considered to be unlikely. Standard proven mitigation measures will be employed as used on other similar type of development.

Accordingly, the screening assessment has identified that significant effects on the environment are not considered likely either alone or in combination with other development and therefore the Proposed Development should not be considered to constitute EIA development as defined by the EIA Regulations.

As outlined in this report, the future planning application would include an Environmental Report addressing the aspects of water environment, ecology, noise, landscape and visual effects, and cultural heritage. Given the scale of the Proposed Development this is considered appropriate to allow the MPA to consider the material matters pertaining to the future application.

Appendix 1
Site Location Plan

Site Location

N

0 75 150 300 Meters

INEOS Shale

INEOS Shale
38 Hans Crescent, Knightsbridge
London, SW1X 0LZ
www.ineosshale.com

Project:	PEDL 304/2 - East Midlands
Title:	Site Location Plan
Date: 09/01/2017	Scale: 1:10,000 CRS: BNG
Drawn By: NF	Checked By: JB Rev:
Plan No:	P304-035

381000
380000
450000
451000
452000

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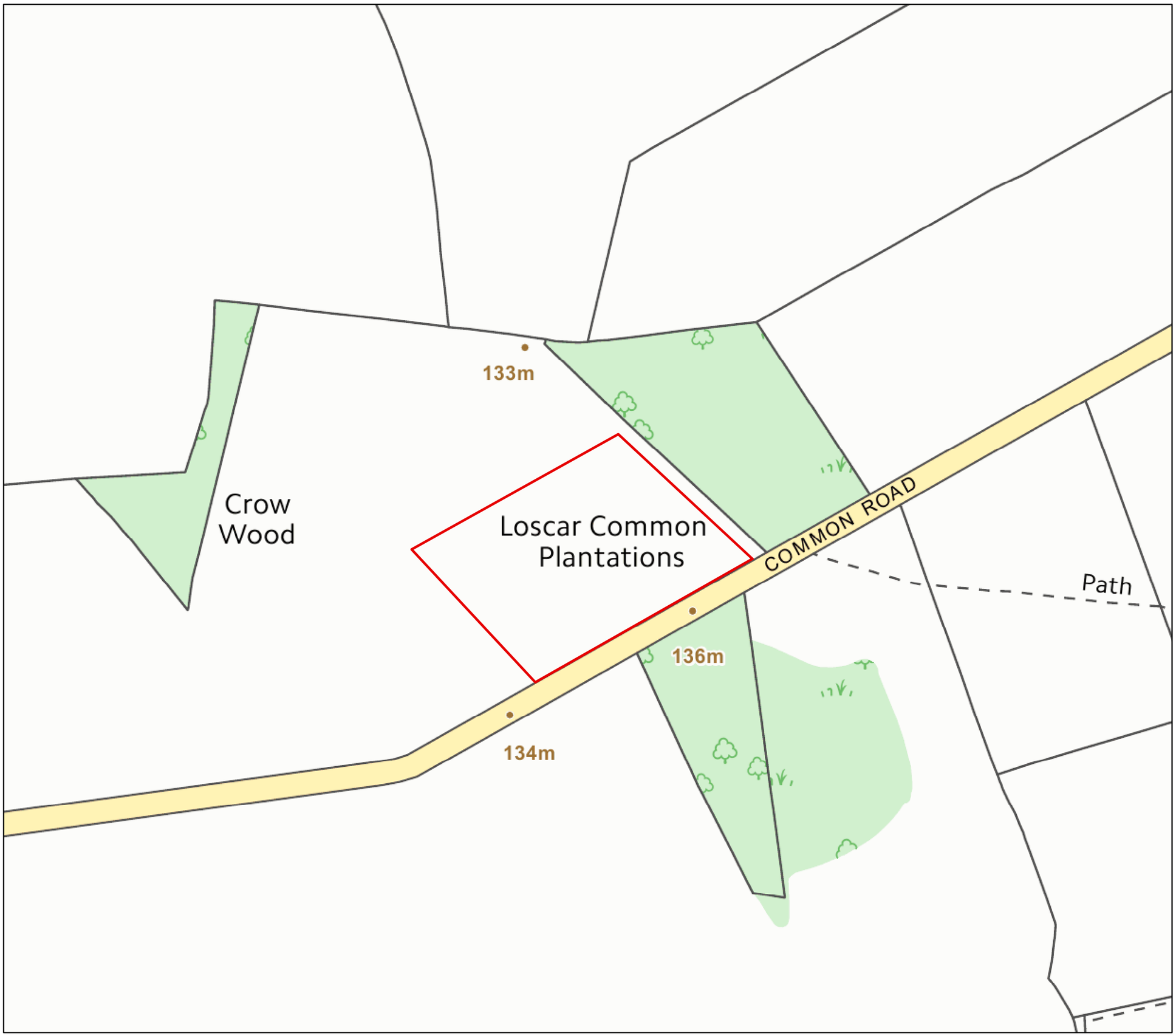


Site Location

N

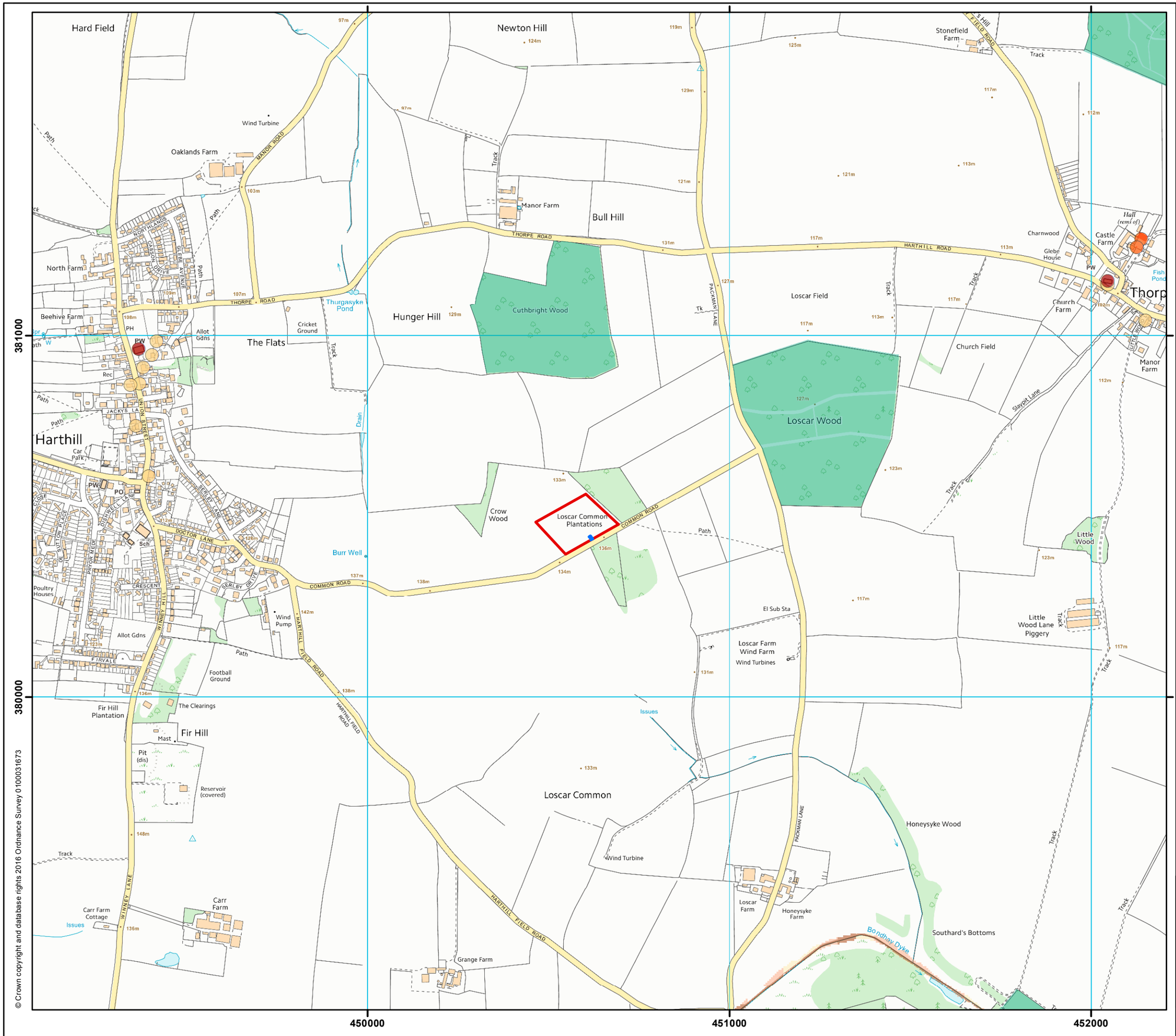
0 20 40 80 Meters

INEOS Shale
38 Hans Crescent, Knightsbridge
London, SW1X 0LZ
www.ineosshale.com

Project:	PEDL 304/2 - East Midlands
Title:	Site Location Plan
Date: 09/01/2017 Scale: 1:2,500	CRS: BNG
Drawn By: NF Checked By: JB	Rev:
Plan No:	P304-036

U:\ArcGIS\GIS_Data\England\Midlands\00_Licences\PEDL304\PDFs\P304_036 - Site Location Plan (Site 2)_10k.pdf

Appendix 2
Designation Plan



- Indicative Access Route
- Site Location
- Listed Buildings I Grade
- Listed Buildings II* Grade
- Listed Buildings II Grade
- National Nature Reserves
- Sites of Special Scientific Interest
- Special Areas of Conservation
- Special Protection Areas

Source Protection Zone

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone of Special Interest

Risk of Flooding from Rivers and Sea

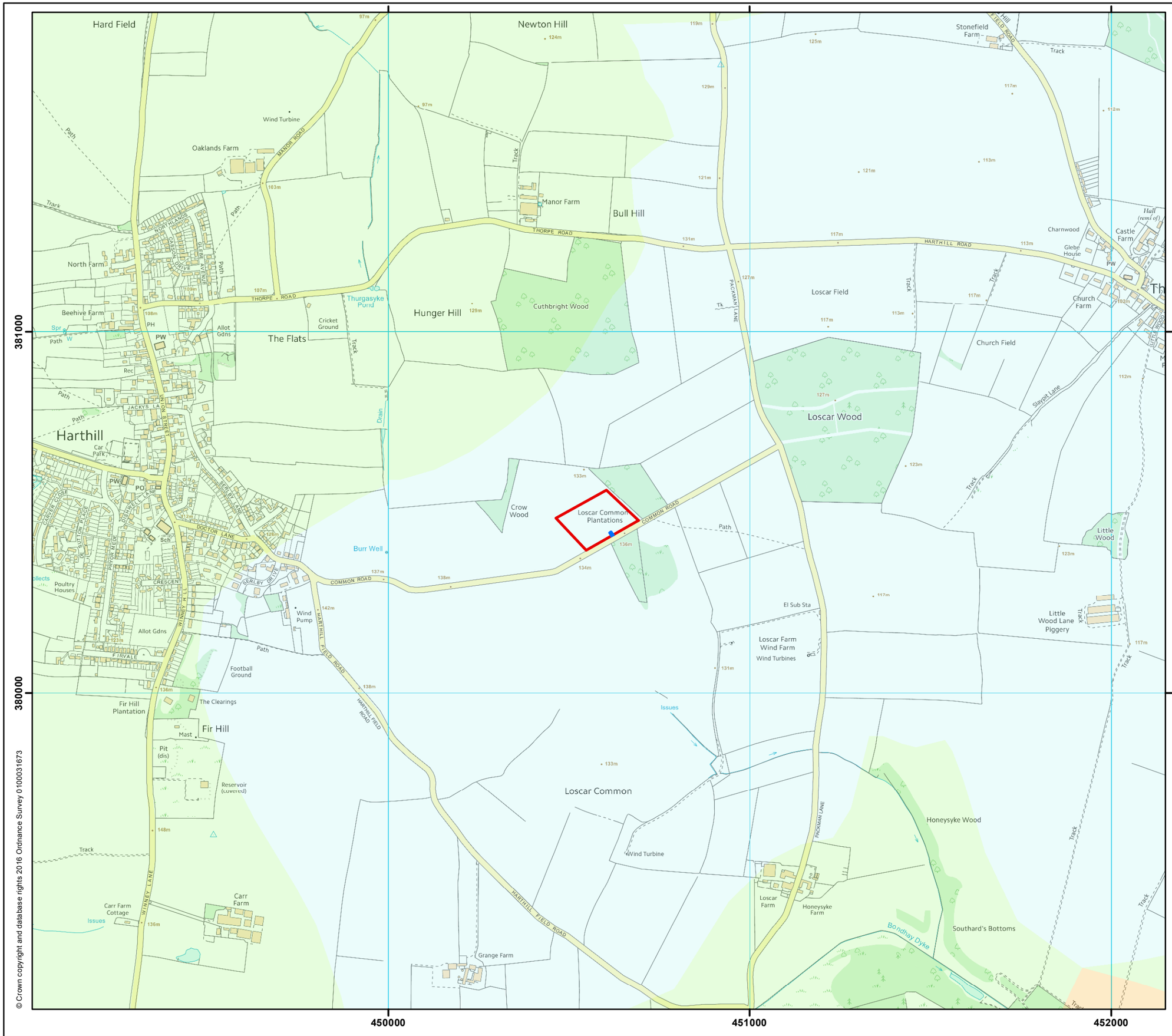
- High
- Medium
- Low
- Flood Risk Areas
- Important Bird Areas
- Scheduled Monuments
- Country Parks
- Air Quality Management Areas
- Local Nature Reserves
- National Parks
- Ramsar
- Ancient Woodland
- Areas of Outstanding Natural Beauty
- World Heritage Sites

N

0 75 150 300 Metres

INEOS Shale
38 Hans Crescent, Knightsbridge
London, SW1X 0LZ
www.ineosshale.com

Project:	PEDL 304/02 - East Midlands
Title:	Designation Plan 1
Date: 27/02/2017	Scale: 1:10,000 @A3 CRS: BNG
Drawn By: JB	Checked By: NF Rev:
Plan No:	P304-037



- Indicative Access Route
- Site Location

Agricultural Land Classification

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban

N

0 75 150 300 Metres

INEOS Shale
38 Hans Crescent, Knightsbridge
London, SW1X 0LZ
www.ineosshale.com

Project:	PEDL 304/02 - East Midlands
Title:	Designation Plan 2
Date: 27/02/2017	Scale: 1:10,000 CRS: BNG
Drawn By: JB	Checked By: NF Rev:
Plan No:	P304-038