SCREENING REQUEST REPORT

WEST NEWTON D WELLSITE

TOWN AND COUNTRY PLANNING

(ENVIRONMENTAL IMPACT ASSESSMENT)

Revision 1

July 2020

CONTENTS

1. INTRODUCTION

Rathlin Energy (UK) Limited (Rathlin) is a private company with its head office in Beverley, East Riding of Yorkshire. Rathlin is a petroleum exploration, development and production company with operations in the United Kingdom. Rathlin is the operator of PEDL 183.

2. SITE LOCATION AND DESCRIPTION

The proposed West Newton D (WND) wellsite is located within open countryside in the East Riding of Yorkshire.

The WND wellsite is located within the Parish of Aldborough. National Grid Reference is TA 20363871(Easting 520366, Northing 438713) and the site is approximately 12m Above Ordnance Datum (AOD). The site is currently in agricultural use (arable). The nearest residential property is Lambwath Hill which lies some 540m to the east of the site. The site access will utilise the private West Newton B access track (approved under planning consent reference DC/14/04107/STPLF/STRAT), a new access track, to be constructed as part of the development, and the use of existing private access tracks.

Site location plan reference ZG-RE-WND-PA-01 is provided in Appendix 1.

The local area has been subject to previous onshore oil and gas exploration. The sites at West Newton A (WNA) and West Newton B (WNB) both screened out the need for an environmental impact assessment. The proposed development at West Newton D represents very similar development which will continue the exploration of the West Newton prospect.

3. DEVELOPMENT DESCRIPTION

3.1 Phase 1: Access and Wellsite Construction

The WND wellsite will require the construction of a new section of access track totalling 96m in length. The new access track will connect the WND wellsite with the existing private access track, which may require upgrading, for a distance of 1.5km before joining the public highway at Flinton Road. The access route will then follow the public highway to the west (Flinton Road/West Newton Road) for 750m, before turning south onto a private access track for a distance of 378m. The route will then follow the public highway to the east (Crook Lane) for 75m before turning south onto the existing West Newton B wellsite access track for a distance of 1.5km, where it joins the public highway (Pasture Lane). Details of any passing places and carriageway improvements that maybe required will be specified within the planning application submission documents.

The 96m section of access track required for WND will be installed by stripping the top-soil and storing it in low-level earth bunds alongside and, where possible, screened by existing tree cover or field boundary hedgerows. Storage locations that minimise the disturbance of soil structures, avoid the need for transportation over exposed sub-soils and facilitate future restoration, will be chosen. The track and wellsite have been placed to minimise the loss of ecological habitats and no trees would be lost.

In order to accommodate the construction of a level platform from which to drill the exploration boreholes, the topsoil will first be removed and formed into bunds of up to 3m in height along the boundary in the direction of the nearest residential receptor or on advice from the landscape assessment. These bunds will be retained on site for subsequent restoration. A level plateau will then be created, formed by way of a neutral cut and fill (i.e. removing subsoil from the higher areas of the site and placing them in the lower areas of the sites, thus creating a level plateau). A ‘v-profile’ ditch will be excavated around the perimeter of the active area of the sites. Concrete chambers (drilling cellars) will be constructed in the middle of the active area of the wellsite using pre-cast concrete rings within which the exploratory boreholes will be drilled. An impermeable high-density polyethylene membrane (HDPE) complete with protective geotextile layers (above and below the HDPE) will then overlay the plateau and a perimeter ditch. A stable and flat finished surface of

crushed and compacted stone will overlay the HDPE impermeable membrane and protective geotextiles allowing for the containment and controlled drainage of surface run-off. The wellsite will be designed in accordance with British Standard [1]and UK guidance 'Containment Systems for the Prevention of Pollution'[2]. The designs will rely upon appropriately designed site investigations performed as part of a geotechnical assessment process managed by suitably qualified engineers.

Clean run-off will be discharged to a drainage ditch adjacent to the site via an interceptor. Water that is not suitable for discharge will be contained and tankered off-site for subsequent treatment and/or disposal at an Environment Agency permitted waste water treatment works. The discharge of water will be regulated by the Environment Agency under EPR 2016.

Approximately twelve (12) construction staff will typically be required together with 3-6 security staff to access the site via cars and light goods vehicles (LGV's). Plant, machinery and materials will be delivered by heavy goods vehicles (HGV's) between 07:00hrs – 18:00hrs, Monday-Friday and 07:00hrs – 18:00hrs on Saturdays. The majority of HGV movements will be scheduled within standard hours of operation (i.e. Monday-Friday 08:00hrs – 17:00hrs, Saturday 08:00hrs – 17:00hrs). Outside of these periods, the flow of HGV's will be controlled by appropriate traffic management measures where necessary to avoid adverse traffic effects and delays.

Foul water, sewage and domestic waste will be collected and contained on site for subsequent off-site transfer to an Environment Agency permitted waste treatment facility. Timber and packaging waste will be segregated for off-site transfer and recycling. The Phase 1 programme is likely to be as shown in Table 1 below:

Table 1: Phase 1 Programme

Phase 1: Wellsite Construction Programme	Hours of Site Operations			Estimated Duration
	Mon - Fri	Sat	Sun/Bank Hols	
1.A Wellsite construction	07:00 – 18:00	07:00 – 18:00	None	14 Weeks

3.2 Phase 2: Drilling, Testing and Appraisal

Two conductor casings (i.e. the outer casing) will be installed and cemented from surface to provide a stable and watertight structural foundation for the subsequent drilling and setting of smaller diameter and deeper casing strings. A conductor setting rig will be mobilised to site with a mast of up to 15m in height.

Following the installation of the conductor the rig will be demobilised and the main drilling rig will be mobilised. The drilling programme will comprise the following operations:

- mobilisation of the main drilling rig (likely to be up to 50m in height) and ancillary equipment to site;
- drilling of up to two exploratory boreholes;
- temporary storage of drilling mud and rock cuttings for subsequent off-site disposal;
- shrouded external lighting illuminating the rig mast, rig floor and ancillary infrastructure; and
- delivery of fuels, equipment, water, cement, materials, drilling chemicals, steel casing and tubing.

Following the completion of the drilling programme each well would be the subject of an initial short-term flow test to confirm the existence of a hydrocarbon reservoir. If successful, a period of extended well testing (EWT) and appraisal of the reservoir will be performed by way of a series of

[1] BS EN 1997-2:2007 Eurocode 7. Geotechnical Design. Ground Investigations and Testing.
[2] CIRIA C736: Containment Systems for the Prevention of Pollution – Secondary, Tertiary and other measures for industrial and commercial premises, I L W Walton (SLR Consulting) CIRIA 2014.

workover operations to determine the productivity and characteristics of the reservoir, estimate its volume and its likely recovery rate.

During EWT it is likely that a workover rig (up to 35m in height) or crane will be used to lower tools into each well on a wire/tubing or within a coiled tubing to perforate the target formation(s), remove debris from within each well by way of a dilute hydrochloric acid wash, prior to the installation of flow-testing and pumping equipment. In some circumstances there may be the need to mobilise a workover rig or a coil tubing unit (up to 25m high) to perform a maintenance workover should downhole pumps or other equipment need to be changed, tubing replaced, or formations cleaning. For clarity there will be no high volume hydraulic fracturing undertaken at the site.

If the well does not flow naturally, an artificial lift will be required to bring hydrocarbons to surface. The two artificial lift techniques are either gas or mechanical.

The most common gas lift technique is the use of inert Nitrogen gas (N2) which is pumped into the wellbore to aid the initial flow of petroleum. N2 injected into the wellbore will displace wellbore fluids, reducing its hydrostatic weight and begin flowing to surface. The surface equipment needed to perform a gas lift includes N2 storage tanks, N2 converter unit as well as deliveries of liquefied N2 to site. This is a short term 24/7 operation to aid natural flow of gas to surface, of approximately 1-5 days.

An alternative to a gas lift is a mechanical lift. This technique could involve the use of either a beam pump or a linear rod pump. This is a 24/7 operation which is required for the duration of the well test to aid oil and gas to surface.

Both techniques involve running a rod string into the well to a downhole pump located in the bottom of the tubing string. The rods are attached to the mechanical pump at surface, which raises and lowers the rods creating a stroke of pump, which, in turn, pumps the oil and gas to surface.

On return to the surface the oil and gas will go through a three (3) phase separator which will separate oil, water and gas. The gas is directed to the gas incineration unit and the oil and water are sent to onsite storage tanks. The oil and water will be tankered off site for subsequent sale and disposal respectively.

Drilling and testing are continuous processes requiring 24-hour working, which introduce noise, air and light impacts outside of the standard hours of operation. Plant, machinery and materials will be delivered by HGV's on a 24/7 schedule. This is to cover the requirements of a 24 hour working phase, however deliveries will be planned and routinely delivered between 08:00hrs – 17:00hrs, Monday-Friday and 08:00hrs – 17:00hrs on Saturdays engaging appropriate traffic management measures where necessary. If natural gas is encountered, incineration may occur to safely dispose of the gas. A single shrouded ground flare or two enclosed flares will be designed and installed subject to approval from the Environment Agency consistent with the EPR 2016.

The below ground depth and trajectory of the wells drilled from WNC are yet to be determined. The target geological formations for the well(s) are the Kirkham Abbey and the Cadeby conventional Permian carbonate reservoirs. Details of the trajectory and construction will be submitted to the Health and Safety Executive twenty one (21) days before the start of drilling and Environment Agency as required by the Water Resources Act 1991.

During the periods of drilling and testing up to thirty (30) personnel (working back to back 12-hour shifts) will be required with 3-6 security staff.

Waste will consist of:

- Extractive waste: drilling muds, rock cuttings, cement, spent dilute acid, produced water and associated natural gas (which are subject to a mining waste permit under the EPR 2016. Waste would be collected and contained on-site for off-site transfer to an Environment Agency permitted waste treatment facility: and

- Non-extractive waste: foul water, sewage and domestic waste will be collected and contained on-site for off-site transfer to an Environment Agency permitted waste-water treatment facility. Timber and packaging waste will be segregated for off-site transfer and recycling.

Upon completion, all drilling and testing equipment and surface machinery will be demobilised, cleaned and removed from the site. The Phase 2 programme is likely to be as shown in Table 2 below:

Table 2: Phase 2 Programme

Phase 2: Drilling Testing and Appraisal Programme	Hours of Site Operations			Estimated Duration per well
	Mon - Fri	Sat	Sun/Bank Hols	
2A Conductor Mobilisation/Demobilisation	07:00 – 18:00	07:00 – 18:00	None	4 days
2B Conductor Drilling	24 hrs	24hrs	24hrs	3 weeks (both wells)
2C Drilling- Mobilisation/Demobilisation	07:00 – 18:00	07:00 – 18:00	None	3 weeks (per mobilisation and demobilisation)
2D Drilling and Completion	24hrs	24hrs	24hrs	12 weeks (per well)
2E: Testing – Mobilisation/Demobilisation	07:00 – 18:00	07:00 – 18:00	None	3 weeks
2F: Testing- Initial and Extended Well Testing	24 hrs	24hrs	24hrs	Up to 30 weeks in total

3.3 Phase 3: Well Plugging, Abandonment and Decommissioning

A workover rig (up to 35m high) will be mobilised to site with generators, pumps and tanks. Cement plugs (barriers) will be set within the well(s) to ensure all distinct permeable zones penetrated by the well are isolated from each other barrier as per prevailing HSE requirements at the time of the well plugging. Once each well is abandoned the casing within each drilling cellar will be cut 1.5m below ground level and a steel plate welded over the casing top to prevent soil from re-entering the borehole.

24-hour working will be necessary introducing noise, air and light impacts outside of the standard hours of operation. Plant, machinery and materials will be delivered by HGV's on a 24/7 schedule. This is to cover the requirements of a 24 hour working phase, however deliveries will be planned and routinely delivered between 08:00hrs – 17:00hrs, Monday-Friday and 08:00hrs – 17:00hrs on Saturdays engaging appropriate traffic management measures where necessary. However, the majority of HGV movements will be scheduled within standard hours of operation. Upon completion, the rig and all other surface machinery will be dismantled, cleaned and removed from the site. Twelve (12) personnel will be required with 3-6 security staff. Waste will be the same extractive/non-extractive mix as at phase 2. The phase 3 programme is likely to be as shown in Table 3:

Table 3: Phase 3 Programme

Phase 3: Well Plugging, Abandonment and decommissioning programme	Hours of Site Operations			Estimated Duration per borehole
	Mon - Fri	Sat	Sun/Bank Hols	
3.A Plugging and abandonment	24hrs	24hrs	24hrs	3 weeks

3.B Removal of surface equipment	07:00 – 18:00	07:00 – 18:00	None	2 weeks

3.4 Phase 4: Site Restoration or Suspension

In the event of restoration, all concrete hardstanding and bunded areas will be cleaned prior to dismantling. The concrete chambers (drilling cellars) will be dismantled leaving the lowest pre-cast concrete ring in situ. Surface aggregates will be inspected prior to removal. Areas where contamination is identified will be removed for subsequent off-site treatment and reuse. The remaining surface aggregate will carefully be removed for subsequent off-site reuse.

Once the impermeable membrane has been removed, the exposed subsoils will be inspected. In the unlikely event that localised contamination is identified, the affected area will be excavated for subsequent off-site treatment and/or disposal at an Environment Agency permitted waste facility. Soil samples will be taken, analysed and compared with soil samples taken prior to construction to confirm the absence of contamination. The subsoil will be cultivated to a depth of 600mm after-which the soil will not be traversed by machinery.

Topsoil may have degraded during storage so it will be tested prior to replacement to determine what treatments, if any, are required to improve its condition. Topsoil will be back-tipped onto loosened subsoil and graded to its original profile. Security fencing will be removed but the highway access may be retained subject to agreement with the Highway Authority. A landscaping scheme will provide for the reinstatement of any hedgerows and trees that have been removed. A site-wide environmental enhancement plan will aim to improve and restore lost biodiversity.

In the event of retention, the exploratory borehole would be suspended with two or three permanent barriers to flow. The site would be cleaned but the stone surface, drainage ditches and the cellar left in place. A container or well protection cage, would enclose the wellhead assembly and all valves closed pending a decision either abandon the well or carry out further works. The security fencing and entrance gates would be retained to prevent unauthorised access.

Approximately six (6) personnel will be required with three to six (3-6) security staff. Plant, machinery and materials will be delivered by HGV's between 07:00hrs – 18:00hrs, Monday-Friday and 07:00hrs – 18:00hrs on Saturdays engaging appropriate traffic management measures where necessary. However, the majority of HGV movements will be scheduled within standard hours of operation. Waste generated will be the same as phase 1. The Phase 4 programme is likely to be as shown in Table 4:

Table 4: Phase 4 Programme

Phase 4: Site Restoration or Suspension programme	Hours of Site Operations			Estimated Duration
	Mon - Fri	Sat	Sun/Bank Hols	
4.A Plugging and abandonment	24hrs	24hrs	24hrs	5 weeks
4.B Site Suspension	None			Subject to determination of a new planning application.

3.5 Development Traffic and Transport

The movement of HGV's associated with each phase of the development will be between 07:00hrs – 18:00hrs, Monday-Friday and 07:00hrs – 18:00hrs on Saturdays. The majority of HGV movements will be scheduled within standard hours of operation (i.e. Monday-Friday 08:00hrs – 17:00hrs,

Saturday 08:00hrs – 17:00hrs) minimising HGV movements outside of these time periods. HGV movements outside of these periods will be controlled by appropriate traffic management measures where necessary to avoid adverse traffic effects and delays. The indicative HGV movement for each phase is shown in Table 5.

Table 5: Heavy Goods Vehicle Schedule

West Newton C – Heavy Goods Vehicle Schedule						
Phase	Sub-Phase	Hours of HGV Operation			Estimated Duration	Estimated Maximum 2-way HGV Movements (In and Out)
		Mon-Fri	Sat	Sun/Bank Hols		
Phase 1: Well Site Construction		07:00 – 18:00	07:00 – 18:00	None	14 Weeks	Up to 10 per day
Phase 2: Drilling Testing and Appraisal Programme	2A Conductor-Mobilisation/Demobilisation	07:00 – 18:00	07:00 – 18:00	None	4 days	Up to 5 per day
	2B Conductor Drilling	24hrs Schedule for 08:00 – 17:00	24hrs Schedule for 08:00 – 17:00	24hrs Schedule to be avoided	3 weeks	Up to 3 per day
	2C Drilling: Mobilisation/demobilisation	07:00 – 18:00	07:00 – 18:00	None	3 weeks	Up to 10 per day
	2D Drilling	24hrs Schedule for 08:00 – 17:00	24hrs Schedule for 08:00 – 17:00	24hrs Schedule to be avoided	12 weeks	Up to 5 per day
	2E: Testing – Mobilisation/demobilisation	07:00 – 18:00	07:00 – 18:00	None	3 weeks	Up to 10 per day
	2F: Testing- Initial and extended well testing	07:00 – 18:00	07:00 – 18:00	None	26 weeks	Up to 5 per day
Phase 3: Well Plugging, Abandonment and decommissioning programme	3A Plugging and abandonment	24hrs Schedule for 08:00 – 17:00	24hrs Schedule for 08:00 – 17:00	24hrs Schedule to be avoided	3 weeks	Up to 10 per day
	3B Removal of surface equipment	07:00 – 18:00	07:00 – 18:00	None	2 weeks	Up to 5 per day
Phase 4: Site Restoration or Suspension	4A Plugging and abandonment	07:00 – 18:00	07:00 – 18:00	None	5 weeks	Up to 10 per day
	4B Site Retention	07:00 – 18:00	07:00 – 18:00	None	26 weeks	None

3.6 West Newton D Site Vehicle Routing

HGV's and delivery vehicles travelling to the WND wellsite will follow a specified route. This is likely to be detailed in a traffic management plan accompanying any planning application.

The site vehicle routing will utilise a combination of both private access tracks and the public highway. Access to the site will be from the public highway at Pasture Lane, travelling north along

the West Newton B access track, turning west onto the public highway (Crook Lane) then turning north along a stretch of private access track joining West Newton Road/ Flinton Road, turning east at the junction with the access track to Lambwath Hill, then turning north along this track before turning west and finally north again into the new access track to the wellsite entrance.

When exiting the site, the directions are the reverse of the above.

3.7 Development Programme

The phases of development are largely consecutive, adopting a logical progression from wellsite construction, through drilling, testing and appraisal to decommissioning, restoration or retention. Phase progression may be disrupted as a result of equipment constraints, the need for maintenance or adverse weather conditions. Such periods will not be significant when the development programme is considered as a whole.

4. POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

For each environmental topic addressed, the baseline environment has been recorded along with a description of the assessment methodology where relevant. The potential impacts are then recorded and used to inform an initial assessment of effects, taking account of mitigation where appropriate. Details of the further environmental information to be provided as part of any proposed planning application are recorded where relevant.

4.1 Landscape and Visual

Assessment Criteria and Methodology

The assessment will be undertaken in accordance with current best practice guidance, namely: 'Guidelines for Landscape and Visual Impact Assessment', (GLVIA) produced by the Landscape Institute with the Institute of Environmental Management and Assessment (Third Edition, 2013).

The study area for landscape and visual effects will be defined by a 3 km offset from the proposed wellsite (Refer Figure WNC/WND- 01 Appendix 2).

Landscape Baseline

Table 6 identifies landscape designations and protected features, within the proposed study area. (Refer Figure WNC/WND- 01 Appendix 2).

Table 6: Landscape Designations and Protected Features

Landscape Designations	Present Within Wellsite Boundaries	Present within the Study Area
National Parks	None	None
Area of Outstanding Natural Beauty	None	None
Important Landscape Area	None	None
Heritage Coast	None	None
Green Belt	None	None
Protected Heritage Assets		
World Heritage Sites	None	None
Scheduled Monuments	None	o Burton Constable medieval settlement and field system, north of Burton Constable Hall. o Shaw Fosse moated site, Humbleton. o Bewick Hall moated site, Aldbrough.
Conservation Areas	None	o Sproatley CA o (Aldbrough CA lies outwith the study area)
Listed Buildings	None	Grade I Listed: o Burton Constable Hall. o Stables and Carriage House Approximately 20 Metres to South-East of Burton Constable Hall. o Church of Saint Peter, Humbleton
Registered Parks and Gardens	None	Burton Constable Park and Garden (Grade II* Listed)
Other Assets		
Recreational /Scenic Routes	None	None
Public Rights of Way	None	Yes (None within 600m)

Country Parks	None	None
Visitor Attraction/ Recreational Facilities	None	o Burton Constable Hall. o Burton Constable Holiday Park.
Tree Preservation Orders	None	N/a

Visual Baseline

There are no protected views, or important vantage points within the study area.

Table 7 identifies potential visual receptor locations within the study area from which the proposed exploration works at the wellsite would be theoretically visible.

Table 7: Potential Visual Receptors

Receptor	Visibility Location
Burton Constable Hall	Grade I Listed Hall and Registered Park and Garden
B1238 at Flinton	Flinton and the setting of the Listed Buildings on Sproatley Road
Pasture Lane	Main approach to Burton Constable
Church of Saint Peter, [illegible]	Grade I Listed Church (partial long-distance views)
Cook Lane	The closest publicly accessible location to WNC
Fosham Road	Public road close to WND
Carlton Road	The closest publicly accessible location to WNC
Tansterne Lane, Rough Hill	Elevated public road close to WND
Low Fosham/ West Carlton	Residential properties close to WND
Aldbrough/ Withernwick Road	Main road to the north of WND
West Newton	Small hamlet between both wellsites

Potential Effects

Based on a preliminary desk-top appraisal, the following landscape and visual effects are predicted:

Landscape Effects

The physical changes to the landscape would be temporary, short term and fully reversible. There would be a temporary and relatively small loss of productive farmland during the operational period, although this would be reinstated after the exploratory works are complete.

Visual Effects

Due to the relatively flat topography the proposed 50m high drilling rig, and to a lesser extent the 35m workover rig on the wellsite would both be theoretically visible from a relatively extensive area. However, due to screening afforded by woodland and hedgerows the views would be mostly confined to local road users, particularly those closest to the wellsite. Generally, the residential properties and the protected heritage assets, including the Listed Buildings, the Grade I Listed Burton Constable Hall and the Church of Saint Peter would be substantially screened by woodland.

Mature hedgerows and woodland to the east and northeast of Burton Constable Hall and the associated gardens, would screen the proposed wellsite. Where gaps in the intervening vegetation allow, the top of the rigs may be visible above the woodland, although this would be limited to a maximum periods of 12 weeks and is unlikely to change the outlook, or setting of the hall and its gardens.

Mitigation Measures and Residual Effects

Given the short duration of the Phase 2 drilling operation, no mitigation measures are considered necessary.

Overall, due to the temporary nature of the development, irrespective of when the drilling works take place, no significant landscape or visual effects are predicted.

4.2 Lighting

Assessment Criteria and Methodology

The proposed development will require artificial lighting for site safety (pedestrian and vehicular), security and collision avoidance (aviation). Such artificial lighting, particularly if poorly designed, has the potential to result in adverse environmental effects i.e. light pollution, or obtrusive light (interchangeable term). Obtrusive light, in a most simplistic sense, can be defined as unwanted light and is a form of pollution. The potentially light-sensitive receptors are human (primarily residential) and ecological.

The proposed lighting study effects are as follows:

- 'Light Intrusion'- light spill affecting a residential receptor;
- 'Glare'- the degree of discomfort associated with a particular light source when viewed against a darker background for a residential receptor;
- 'Sky-glow'- the effect of artificial lighting on the natural night sky derived from the upward light ratio of a lighting installation; and
- 'Light spill' - the spilling of light beyond the area to be lit and in the context of this lighting study, spill light affecting ecological receptors.

For the Drilling Stage and Testing Stage (Phase 2), the potential impacts will be presented by qualitative means based on professional judgement, prior to mitigation and then the presentation of residual effects by quantitative means based on detailed 3D lighting model outputs.

For other stages, the potential impacts will be presented by qualitative means based on professional judgement, prior to mitigation and then the presentation of residual effects, also by qualitative means based on professional judgement. Where necessary, the outputs of the lighting models produced for the drilling and testing phases will be considered for such other stages, representing a conservative assessment of obtrusive light impacts.

Baseline Environment

The assessment of impacts will rely upon a baseline light survey, aerial photography and Ordnance Survey (OS) mapping of the immediate area, from which the prevailing lighting conditions would be characterised. Daytime photography will be undertaken from the development site and immediate study area. Long-exposure High Dynamic Range night-time photography will be undertaken. The use of HDR imaging techniques allows for better reproduction of shadows and highlights than standard imagery; therefore, revealing detail more akin to that viewed by the human eye. In addition to photography, a baseline light survey will be undertaken. Vertical illuminance (Ev - lux) measurements will be made using a suitable UKAS calibrated illuminance meter capable of accurately measuring low light levels down to 0.001 lux.

The relevant ILP Environmental Zone(s) will be established based on quantitative and qualitative assessment.

Assessment Criteria

Human

In the absence of statutory guidance, it is proposed that the ILP Guidance Notes for the Reduction of Obtrusive Light would be adopted as criteria against which to assess the effects of artificial lighting on residential receptors; this is considered best practice.

ILP Environmental Zone Classification

The ILP has developed an Environmental Zone classification system for the categorisation of areas with regard to suitable obtrusive lighting limits. The Environmental Zone classifications are reproduced in Table 8:

Table 8: ILP Environmental Zone Classification

ILP Environmental Zone Classification			
Zone	**Surrounding**	**Lighting Environment**	**Examples**
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM 15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

ILP Environmental Zone Criteria

For each Environmental Zone, obtrusive light limits for exterior lighting installations have been determined. The limits are intended to support decision makers in establishing whether artificial lighting is detrimental to local amenity or a potential statutory nuisance. The Environmental Zone criteria are reproduced in Table 9:

Table 9: Environmental Zone Criteria

ILP 'Light Intrusion' (vertical illuminance) Limits E_v - lux					
Application Conditions	**Environmental Zone**				
	E0	**E1**	**E2**	**E3**	**E4**
Pre-curfew	n/a	2	5	10	25
Post-curfew	n/a	< 0.1 *	1	2	5

* If the installation is for public (road) lighting then this may be up to 1 lux.

ILP 'Glare' (source intensity) Limits I - cd						
Application Conditions	**Luminaire group (projected area A_p in m^2)**					
	0 < Ap ≤ 0.002	**0.002 < Ap ≤ 0.01**	**0.01 < Ap ≤ 0.03**	**0.03 < Ap ≤ 0.13**	**0.13 < Ap ≤ 0.50**	**Ap > 0.50**
E0 Pre-curfew E0 Post-curfew	0 0	0 0	0 0	0 0	0 0	0 0
E1 Pre-curfew E1 Post-curfew	0.29 d 0	0.63 d 0	1.3 d 0	2.5 d 0	5.1 d 0	2,500 0
E2 Pre-	0.57 d	1.3 d	2.5 d	5.0 d	10 d	7,500

curfew E2 Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	500
E3 Pre-curfew E3 Post-curfew	0.86 d 0.29 d	1.9 d 0.63 d	3.8 d 1.3 d	7.5 d 2.5 d	15 d 5.1 d	10,000 1,000
E4 Pre-curfew E4 Post-curfew	1.4 d 0.29 d	3.1 d 0.63 d	6.3 d 1.3 d	13 d 2.5 d	26 d 5.1 d	25,000 2,500

1) d is the distance between the observer and the 'glare' source in metres

2) Upper limits for each zone shall be taken as those with column Ap > 0.5

ILP 'Sky-glow' (upward light ratio) Limits ULR - %				
Environmental Zone				
E0	**E1**	**E2**	**E3**	**E4**
0	0	2.5	5	15

Ecological

There are currently no definitive guidelines in wide acceptance, setting out absolute light pollution limits affecting ecological receptors. For the sake of the proposed lighting study, commonly adopted ecological lighting assessment criteria will be adopted, unless specific criteria are requested as a result of the consultation process.

Potential Impacts and Effects

An initial assessment finds negligible adverse residual effects upon human receptors across all phases, derived from 'light intrusion', 'glare' and 'sky-glow'. Negligible/minor adverse effects are anticipated for ecological receptors across all phases, derived from light spill alone.

Mitigation Measures and Residual Effects

An assessment of effects will accompany a planning application to establish planning policy compliance. Mitigation will inform the design process. An environmentally sympathetic scheme of lighting will be used and a lighting management plan will be designed to minimise effects while remaining consistent with relevant health, safety and environmental protection regulations. Potential impacts are shown in Table 10.

Table 10: Potential Impacts

Phase of Development		Source of Impact	Receptor	Likely Residual Effect	Likely Significant Effect (pre-mitigation)
1	**Monitoring boreholes and baseline monitoring**	'Light Intrusion'	Residential	Negligible Adverse	✘
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
2	**Earthworks and drainage**	'Light Intrusion'	Residential	Negligible Adverse	✘
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible /	✓

Phase of Development		Source of Impact	Receptor	Likely Residual Effect	Likely Significant Effect (pre-mitigation)
				Minor Adverse	
3	Access road construction	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
4	Pad construction and cellars for x2 wells	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
5	Conductor setting	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
6	Drilling x2 wells (lateral or deviated wells) – may include coring	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
7	Acidisation of both wells – below fracture gradient	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
8	Well clean up	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
9	Extended well test to flare systems	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓
10	Plug the x2 wells and restore the site including aftercare	'Light Intrusion'	Residential	Negligible Adverse	✗
		'Glare'	Residential	Negligible Adverse	✓
		'Sky-glow'	Residential	Negligible Adverse	✓
		Light Spill	Ecological	Negligible / Minor Adverse	✓

4.3 Noise and Vibration

Assessment Criteria and Methodology

The proposed development as a whole will be assessed in accordance with the Government's noise policy aims, including the Noise Policy Statement for England [Ref. 1] (NPSE), National Planning Policy Framework (NPPF) and Planning Practice Guidance: Minerals [Ref. 2] (PPG-M). The assessment criteria and methodologies used for each phase are summarised in Table 11.

Table 11: Assessment Criteria and Methodology

Phase	Assessment Methodology
Road traffic noise (all phases)	DMRB [Ref. 3]
Construction of site and access track and restoration (phases 1 and 4) – daytime only	BS 5228 [Ref. 4]
Drilling, testing and appraisal (phase 2)	PPG-M, WHO [Ref. 5] and WHO NNG [Ref. 6]
Well plugging, abandonment and decommissioning – including use of workover rig (phase 3)	PPG-M, WHO

The noise emissions from the proposed activities will be modelled using the CadnaA environmental noise prediction software. This model calculates the contribution from each noise source input as a specified source type (e.g. point, line, area) octave band sound power levels at selected locations. It predicts noise levels under light down-wind conditions based on hemispherical propagation, atmospheric absorption, ground effects, screening and directivity based on the procedure detailed in ISO 9613.

Baseline Environment

It is proposed to carry out long-term baseline sound level monitoring, over a period of at least one week, in eight locations representative of the nearest and potentially most affected NSRs to the two proposed development sites. The proposed long-term monitoring locations are as follows:

- Caley Cottage: approximately 620 m noth-west of WND
- West Newton Grange: approximately 700 m to the north-east of WNC
- Smithy Briggs or Smithy Briggs Cottage: approximately 630 m west of WNC
- Low Fosham: approximately 530 m north-east of WND
- Straits Farm or South End: approximately 950 north-east of the existing WNA site
- Model Farm or Old Farm: approximately 960 m to the south of WND
- Flinton: approximately 970 m south-east of WNC
- West Carlton: approximately 1.4 km east of WND

In addition to the long term monitoring locations outlined above, supplementary short-term attended monitoring will be undertaken near Wood End House, Brickyard Cottage and Sproatley Village.

The surveys will conform with the requirements of BS 7445-1.

The noise monitoring data will be supplemented by historic noise monitoring data undertaken previously for the WNA and WNB noise impact assessments.

Potential Impacts and Effects

Construction and restoration (Phases 1 and 4)

Construction and restoration activities will only take place Monday to Saturday 0700 to 1800 with no working on Sundays or bank holidays. By using best practicable means for site construction it is

expected that the relevant criteria set out in BS 5228 will be achieved and significant impacts are not likely.

Drilling, testing and appraisal (Phase 2)

Drilling, testing and appraisal will be a 24/7 activity including the use of a drilling rig, workover rig and flaring. Through use of best practicable means and selection of quiet equipment where technically feasible, it is expected that noise levels can be kept at or below the criteria set out in the PPG-M. Consequently, it is not expected that that significant impact due to noise will be experienced at even the closest receptors to the sites which are located beyond 500m from the site.

Well plugging, abandonment and decommissioning (Phase 3)

The workover rig utilised in this phase will be smaller than the rig used in Phase 2 and for a shorter amount of time. It is expected that noise levels in this phase will be well within the PPG-M criteria and therefore significant impacts due to noise are not expected.

Traffic (all phases)

Construction HGV traffic will only access the site Monday to Saturday 0700 to 1800 hours with no deliveries on Sundays or bank holidays. Some HGV movements may occur out-with these hours during phase 2 but it is anticipated that the majority of traffic will access the site between 0800 to 1700 hours. Consequently, no significant effects are expected due to HGV traffic.

Vibration (all phases)

Ground borne vibration due to site activities (e.g. construction, drilling, testing, appraisal), is expected to be imperceptible outside the site perimeter. Likewise, the effects of vibration due HGV traffic using the access roads and public highways is not likely to be significant or perceptible. Consequently, it is proposed to screen vibration out of the assessment.

Mitigation Measures and Residual Effects

The approach taken for this development will be to utilise best available technology to reduce noise levels to as low as reasonably practicable from the outset. Should the noise assessment identify and potentially significant impacts, or any noise levels at the receptors which are likely to exceed the relevant criteria as set out in the PPG-M, mitigation measures will be utilised to reduce noise from the site and access roads as follows (where feasible - depending on site, operational and safety constraints etc.):

- Limiting hours of working for construction and HGV traffic;
- Alterations to the site layout to reduce noise at selected receptors;
- Use of inherently low noise equipment where feasible (e.g. use of induction brakes rather than drum brakes, shrouded or enclosed flares, use of automated pipe handling etc.);
- Use of engineering noise control measures (e.g. silencers, enclosures, lagging) to minimise noise at source;
- Provision of screening and bunds around the site boundary;

Taking the above mitigation measures into account, and based on experience at other sites, including West Newton A and B, it is expected that noise from the proposed developments will not result in a significant adverse effect to either health or quality of life to even the closest receptors to the development.

References

Ref. 1 Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. Defra. 2010.

Ref. 2 Department for Communities & Local Government. Planning Practice Guidance: Minerals. HMSO. 2014.

Ref. 3 The Highways Agency, Transport Scotland, Welsh Government and the Department for Regional Development Northern Ireland (2019) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7: Noise and Vibration (LA 111)

Ref.4 British Standards Institution. British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 1: Noise

Ref. 5 Berglund, B. et al. Guidelines for Community Noise. World Health Organisation. 2000

Ref 6 European Centre for Environment and Health. Night Noise Guidelines (NNGL) for Europe. World Health Organisation. 2009

4.4 Ground and Groundwater Protection

Assessment Criteria and Methodology

A review of published information sources including Ordnance Survey (OS) mapping data, British Geological Survey (BGS) mapping and other data sets, data held by Natural England and accessible through the MAGiC database, Flood Estimation Handbook (FEH), data from the Environment Agency and East Riding of Yorkshire Council; together with data held by the Applicant has been undertaken to understand the likely baseline conditions at the Site and in the surrounding area. The baseline data has been used to develop a conceptual model of the ground, groundwater and surface water systems.

A preliminary assessment has been carried out to consider potential hazards and sources of pollution that may be associated with each phase of the Proposed Development. These phases are: Site construction; drilling and testing of hydrocarbon exploration boreholes; well abandonment and site restoration. The potential migration pathways for pollutants and their potential impacts on receptors have been examined and the environmental risks qualitatively assessed by analysis of the source-pathway-receptor (SPR) linkages. Mitigation measures have been taken into account when considering the likely significance of effect to the identified receptors.

Environmental Baseline

Site Setting and Description

The Site is located in a rural setting on low-lying coastal farmland in the Holderness area of the East Riding of Yorkshire approximately 14km northeast of Hull. The Site lies at an elevation of approximately 12m AOD. The area is characterised by a sparse population with small villages and scattered hamlets and farms. The North Sea coastline is located approximately 5km to the east of the Site. The Site location is shown on Figure 1. (Appendix 3)

Land Use and Soils

The land at the Site and in the surrounding area is arable farmland with occasional scattered woodlands. The soils at the Site are characterised as:

Slowly permeable seasonally wet, slightly acid but base rich loamy and clayey soils with impeded drainage and moderate natural fertility.

Hydrology

Lambwath Stream is the closest watercourse located approximately 0.9km to the north. The stream drains westward and joins a managed drainage system that ultimately discharges to the Humber Estuary at Hull. A series of field drains (“dikes”) drain the land around the site northwards into Lambwath stream.

The Environment Agency’s flood map for planning shows that the Site is located in Flood Zone 1 with sections of the access track falling within Flood Zone 3. The risk of both fluvial and pluvial (surface water) flooding at the Site is very low.

Geology

The geology of the Site has been interpreted using the published BGS geological map for Hornsea (sheet 71 [Ref.2]) and geological map and memoir for Patrington (sheet 81 [Ref. 3, 4]). The geological setting is shown on Figure 2 (Appendix 3).

The Site is located on superficial glacial till deposits which are thick and widespread across the area. River alluvium is mapped approximately 0.6km north of the Site along the course of the Lambwath Stream; sporadic patches of glaciofluvial sand and gravel are mapped in the wider area.

Beneath the superficial deposits the bedrock geology comprises a large thickness of Cretaceous Chalk which unconformably overlies a thin Jurassic mudstone sequence (Lias Group) and a thicker Triassic and Permian succession. The Triassic rocks comprise mudstones and sandstones of the Penarth, Mercia Mudstone and Sherwood Sandstone Groups and the Permian sequence is composed predominantly of mudstones, evaporites and limestones of the Zechstein Group. A large thickness of Carboniferous Coal Measures underlies the Permian strata beneath an unconformity.

The geological sequence at the Site is summarised in Table 12.

Table 12: Expected Geological Sequence

Period	Group/Formation		Description	Approximate Thickness (m)	Approximate Depth to Base of Unit (mTVD)
Quaternary	*Fluvial Deposits*	*Alluvium*	*Clay, silt, sand and gravel.*	*Not present at Site but mapped to north*	-
	Till/Glaciofluvial Deposits		Diamicton with interbeds/ lenses of sand and gravel	45	45
Cretaceous	White Chalk Subgroup	Rowe Chalk Formation	White, flint-bearing chalk with sporadic marl bands.	25	70
		Flamborough Chalk Formation	White, well-bedded, flint-free chalk with common marl seams (typically about one per metre). Common stylolitic surfaces and pyrite nodules.	265	335
		Burnham Chalk Formation	White, thinly-bedded chalk with common tabular and discontinuous flint bands and sporadic marl seams many of which are named and divide the succession	95	430
		Welton Chalk Formation	White, massive or thickly bedded chalk with common flint nodules; generally lacking tabular flint bands; sporadic marl seams including the Plenus Marls Member	55	485
	Grey Chalk Subgroup	Ferriby Chalk Formation	Grey, soft, marly, flint-free chalk, typically weathering buff in exposures; locally includes pinkish bands; some harder, gritty, shell-debris-rich beds, and thin discrete marl seams.	15	500
	Cromer Knoll Group	Hunstanton Chalk Formation	Rubbly to massive chalks with marl bands. The lower part of the formation is commonly weakly sandy.	2	502
Jurassic	Lias Group		Mudstones	200	700
Triassic	Penarth Group		Mudstones with subordinate limestones and sandstones	20	720

Period	Group/Formation		Description	Approximate Thickness (m)	Approximate Depth to Base of Unit (mTVD)
	Mercia Mudstone Group		Predominantly mudstones with subordinate siltstones, sandstones and evaporites.	450	1170
	Sherwood Sandstone Group		Sandstones with some conglomeratic beds and subordinate siltstones/mudstones	700	1870
Permian	Zechstein Group (Undifferentiated including: Roxby Formation, Sherburn Anhydrite Formation, Carnallitic Marl Formation, Boulby Halite, Billingham Anhydrite Formation)		Mudstone and siltstone overlying an evaporite sequence (predominantly anhydrite and halite)	150	2020
	Zechstein Group	Brotherton Formation	Dolomitic limestone	75	2100
		Fordon Evaporite Formation	Varied sequence of evaporites including anhydrite and halite, with some gypsum and dolostone	550	2650
		Kirkham Abbey Formation	Cream, oolitic dolostone with subordinate thin beds of fine-grained dolomite. Breccias also present.		
		Hayton Anhydrite Formation	Anhydrite and dolomite		
		Cadeby Formation	Dolomite with variable amounts of anhydrite	100	2750
	Rotliegend Group	Yellow Sands Formation	Sandstone	75	2825
Carboni-ferous	Coal Measures Group		Mudstone, sandstone, siltstone and coals	>500	>3300

Geological Structure

Bedrock strata dip at a shallow angle to the northeast and no faults are mapped close to the Site.

Hydrogeology

The presence of aquifers at the Site has been assessed using information from the Environment Agency publications – the physical properties of major aquifers in England and Wales [Ref 5.]; the physical properties of minor aquifers in England and Wales [Ref. 6], and the Agency's updated groundwater vulnerability mapping. The hydrogeological units are summarised in Table 13 below.

Table 13: Hydrogeological Units

Unit	Aquifer Designation	Description/Comments
Glacial Till and Alluvium	Secondary (Undifferentiated) and Secondary A Aquifers	The thick glacial till in the area is classified as a Secondary Undifferentiated Aquifer however is expected to be predominantly fine grained and of low permeability. In some areas the till is interleaved and interbedded with sand and gravel deposits and may be in horizontal hydraulic connection with alluvium deposits locally. The superficial deposits may be able to support small local water supplies (although none are recorded close to the Site). Overall, this unit is poorly permeable and confines the underlying chalk aquifer; however, where sand and gravel are present a hydraulic

Unit	Aquifer Designation	Description/Comments
		connection with the bedrock is possible.
Chalk Group	Principal Aquifer	The Chalk Group is classified as a Principal Aquifer of national importance; however, in the Holderness area the aquifer is confined by up to 50m of low permeability glacial till and is rarely used for water supply due to restricted groundwater circulation and the resulting poor quality of the water. Groundwater flows down the hydraulic gradient from the Yorkshire Wolds in the west, and either emerges as springs at the edge of the superficial cover (glacial deposits) or is pumped from the semi-confined aquifer, to the west of the site. Natural recharge to the Chalk Group is by direct infiltration of effective rainfall at outcrop. The Chalk outcrops approximately 20km to the west of the site. The general groundwater flow direction at the Site is towards the northeast. Transmissivity values in the Chalk of the Holderness area are typically <122m^2/day. The chalk is capable of supporting large water supply abstractions although local water quality is likely to be reduced compared with areas closer outcrop in the west.
Lias Group, Penarth Group and Mercia Mudstone Group	Secondary B	This unit includes Secondary B Aquifers which are predominantly thick successions of mudstones with some subordinate sandstones and limestones. Due to the depth of the strata at this location (>500m TVD), the very low permeability of the formations and the large distance to potential recharge at outcrop (the Lias outcrops some 30km to the west); these units do not constitute viable sources of groundwater with a resource value as defined by UKTAG [Ref. 7]. This unit also provides a very low permeability hydraulic barrier between the groundwater system in the overlying Chalk Group and water contained in the underlying Sherwood Sandstone Group.
Sherwood Sandstone Group	Principal Aquifer	The Sherwood Sandstone Group is a nationally important Principal Aquifer; however, at this location the unit is deeply buried beneath >1000m of strata (much of which is low permeability) and therefore any water present can be considered formation water and will be of extremely poor quality with elevated salinity and no resource value as defined by UKTAG [Ref. 7].
Permian Strata	Principal and Secondary Aquifers	This unit comprises thick sequences of mudstones and evaporites (Secondary Aquifers regionally) which separate permeable limestone units of the Brotherton and Cadeby Formations (Principal Aquifers regionally). The Kirkham Abbey and Cadeby Formations are being targeted for hydrocarbon exploration and a major gas discovery was proven locally in the Kirkham Abbey Formation. These strata have a very low vertical hydraulic conductivity due to the presence of thick sequences of mudstones and evaporites and are not connected with the aquifers above. Any water present can be considered formation water of extremely poor quality with elevated salinity and hydrocarbons present and of no resource value as defined by UKTAG [Ref. 7].

Hydrogeological Conceptual Model

The hydrogeological conceptual model for the Site comprises four units as follows:

- Unit 1: Variably permeable superficial deposits and the Chalk Group Principal Aquifer containing groundwater of potentially high resource value.
- Unit 2: The Lias, Penarth and Mercia Mudstone Groups Secondary B Aquifers. Low permeability strata which hydraulically separate the Chalk Group from underlying permeable strata in Unit 3 and Unit 4.
- Unit 3: The deeply buried and confined Sherwood Sandstone Group containing saline groundwater (formation water) of no resource value.
- Unit 4: The deeply buried and hydrocarbon bearing Permian strata of the Zechstein and Rotliegend Groups containing saline groundwater (formation water) of no resource value.

Sensitive Water Dependant Features

Water features within a 5km search radius of the Site have been identified using OS mapping data, data from the Environment Agency, East Riding of Yorkshire Council, Natural England and the BGS. Features taken into account include:

- Surface and groundwater systems
- Groundwater dependant terrestrial ecosystems (GWDTEs).
- Historic water wells
- Registered Private Water Supplies (PWS).

The identified features within 5km of the Site are displayed on Figure 3 (Appendix 3) and include:

- Surface water field drains in the vicinity of the Site including an unnamed dike just north of the Site boundary and "L. Dike" 0.4km to the east of the Site.
- The Lambwath Stream located approximately 0.9km north of the Site.
- A Site of Special Scientific Interest (SSSI) located approximately 1km to the north at Lambwath Meadows. This site comprises low-lying seasonally flooded hay field habitats.
- Two historic boreholes targeting the Chalk Group Aquifer at Coniston Lane (4.6km to the southwest) and Smithy Briggs (1.9km to the south).
- Two registered PWS at Cowden Magna (Chalk Group Aquifer) and Manor Farm (source unrecorded but expected to be superficial deposits or Chalk Group aquifer), located 3.2km and 4.2km northeast of the Site respectively.

A search of Environment Agency licensed and deregulated abstractions will be undertaken together with a review of unregistered PWS that may be present at rural and outlying properties, as part of a more detailed data review.

Potential Impacts and Effects

The proposed construction, drilling, testing and restoration activities have the potential to give rise to adverse effects on the surface water and groundwater environment.

Potential surface water and groundwater receptors include:

- The shallow surface water system in the vicinity of the Site including the field drain ("dike") system.
- The Lambwath Stream.
- Lambwath Meadows SSSI.
- The groundwater system within the superficial deposits aquifer.
- The groundwater system in the Chalk Group aquifer.
- Historic boreholes targeting the Chalk Group aquifer at Coniston Lane and Smithy Briggs.
- Registered PWS at Cowden Magna and Manor Farm targeting the Chalk Group/superficial deposits.
- Unrecorded PWS that may obtain water from the superficial deposits and/or the Chalk Group.
- Deeper water bearing formations beneath the Chalk Group with limited or no resource value.

The hazards associated with the Proposed Development include:

- Flushing of contaminated soils during site construction and restoration (before the liner is in place or after it is removed).
- Creation of vertical pathways during construction of the well cellars, wells, and groundwater monitoring boreholes (if required).
- Spillage/leakage of sewerage and foul water from welfare facilities at the Site.
- Spillage of fuels, lubricants and other materials while being transported to/from the Site or when in use by the plant and equipment at the Site to carry out the construction and testing activities.
- Loss of drilling muds, additives and cement grout during drilling operations.
- Migration of well construction and stimulation fluids, produced water and hydrocarbons from deep formations during drilling and testing of the wells.
- Spillage of produced hydrocarbons and produced water during transfer to tankers on site.

Mitigation Measures & Residual Effects

The Proposed Development includes a very high level of embedded mitigation measures designed to protect surface water and groundwater, including:

- A geotechnical ground investigation will be carried out to confirm that the ground is free from contamination and the ground is suitable to support the Site, drill rig and associated equipment.
- Temporary fencing will be erected around the perimeter of the Site to provide security and prevent unauthorised access to the Site.
- Construction and restoration works that expose the soil will not take place during periods of heavy rainfall.
- A perimeter drain will be installed around the Site to prevent rainfall running directly from the Site into the local surface water system.
- The Site will be constructed taking account of CIRIA guidance C736: Containment Systems for the Prevention of Pollution [Ref 1] using a low permeability base (HDPE membrane and non-woven geotextile liner) providing a hydraulic break and low velocity layer between the Site and underlying geology. Once the liner is in place, the Site will be effectively hydraulically isolated from surface water and groundwater systems. The liner will ensure any surface runoff water flows to the perimeter ditch and will allow any fluid spillage/leakage at the Site to be cleaned up before it can migrate from the Site. The HDPE membrane will be incorporated into the cellar construction to maintain environmental integrity of the active area of the Site.
- Concrete bunds (secondary containment) will be constructed to accommodate produced oil and formation water storage tanks; a concrete tanker bay will accommodate tankers loading oil from storage tanks.
- Oil, fuel and chemicals will be stored in containers in an enclosed bunded area in accordance with the CIRIA guidelines [Ref. 1] above a membrane liner to prevent spills and leaks entering the drainage system. Where two or more tanks are installed within the same bund, the capacity of the bund will be the greater of:
    - 110 per cent of the capacity of the largest tank within the bund, or
    - 25 per cent of the total capacity of all of the tanks within the bund, except where tanks are hydraulically linked in which case they will be treated as if they were a single tank.
- All surface runoff within the Site will be directed into the Site's surface water drainage system, which will discharge via an oil interceptor to a local field drain. As part of the surface water management plan and Environmental Permit requirements for the Site, the discharge will be routinely checked and tested where necessary. If the water is not suitable for discharge, then it will be contained within the surface water drainage system and tankered from the Site for disposal at an approved facility.
- Pipework and equipment used for the construction and testing of the borehole will be regularly inspected for spills and leaks. Key equipment will be contained within temporary bunds.
- Construction of the wells will be carried out in accordance with HSE legislation. The wells will be cased to sufficient depth to prevent vertical migration of fluids between different hydrogeological units and to hydraulically separate shallow groundwater with a resource value from groundwater (formation water) with limited or no resource value contained in deeper formations.
- Conventional water well drilling techniques will be used when drilling through the Chalk Group strata.
- Any groundwater monitoring boreholes required will be located outside the well pad area and will be constructed taking account of Environment Agency best practice guidance [Ref.8].

With the above mitigation measures in place, the residual effects to receptors for all the identified hazards are likely to be minor and therefore not significant in EIA terms.

References

Ref.1 CIRIA C736: Containment Systems for the Prevention of Pollution – Secondary, Tertiary and other measures for industrial and commercial premises, I L W Walton (SLR Consulting) CIRIA 2014.

Ref.2 BGS Geological Map Sheet 71. Hornsea

Ref.3 BGS Geological Map Sheet 81. Patrington

Ref.4 Geology of the country around Grimsby and Patrington: memoir for 1:50000 geological sheets 90 and 91 and 81 and 82 (England & Wales)

Ref.5 Allen, D J, Brewerton, L J, Coleby, L M, Gibbs, B R, Lewis, M A, MacDonald, A M, Wagstaff, S J, and Williams, A T. 1997. The Physical Properties of Major Aquifers in England and Wales. British Geological Survey Technical Report WD/97/34. 312pp. Environment Agency R&D Publication 8.

Ref.6 Jones, H K, et al. 2000. The physical properties of minor aquifers in England and Wales. British Geological Survey Technical Report, WD/00/4. 234pp. Environment Agency R&D Publication 68.

Ref.7 UK Technical Advisory Group on the Water Framework Directive, Defining and Reporting on Groundwater Bodies, V6.21/Mar/2011, Final 300312.

Ref.8 Guidance on the design and installation of groundwater quality monitoring points. Science Report SC020093

4.5 Air Quality, Climate and Climate Change

Assessment criteria and methodology

Releases to atmosphere

The assessment of air quality impact will be undertaken in accordance with the guidance provided by the Environment Agency (Air emissions risk assessment) and by DEFRA (LAQM TG16).

Air quality impact will be studied using the UK ADMS and US EPA AERMOD dispersion models and will be over an appropriate assessment area which incorporates nearby locations of prolonged human exposure and sensitive ecological sites. Meteorological information will be obtained from the UK Meteorological Office and will be representative of the assessment area.

The significance of the determined air quality impact will be assessed against Environment Agency screening criteria for human health and ecology.

Air quality assessment of road traffic emissions

The proposed development will give rise to a change in road traffic on local access roads and will have an impact on local air quality. The changes to local traffic flows will be assessed initially for significance using the Highways England Design Manual for Roads and Bridges.

Dust releases from construction activities

Construction activities have the potential to give rise to releases of dust. An assessment of the risk of dust impact will be undertaken using the methodology published by the Institute of Air Quality Management in 'Guidance on the assessment of dust from demolition and construction'. Where required recommendations for mitigation measures to minimise dust impact during these activities will be identified.

Releases of odour from site operations

There is the potential for releases of odour, both from combustion activities and from fugitive releases of natural gas by leakage or emergency venting. ADMS 5 will be used to model the dispersion of odour releases to predict the likely process contribution to ambient odour

concentrations at sensitive receptors and to determine significance based on assessment criteria published by the Environment Agency.

Greenhouse gas releases

Based on the specification of the equipment proposed and adopting worst case operation and scheduling, an inventory of the releases of greenhouse gases for the entire project duration will be determined.

Baseline environment

Rathlin has two well site developments local to the Application site, known as West Newton A and B and propose to development a further site, West Newton C. Releases from the West Newton A and B are largely confined to fugitive well releases. While operations at West Newton C may give rise to releases, the site is some 2 km to the south east of the Application site. It is considered unlikely that any of these operations will have a meaningful influence on background pollutant concentrations around the Application site.

There are no Air Quality Management Areas (AQMAs) in the immediate vicinity of the Application site where pollutant releases would be expected to influence local air quality. The nearest AQMA is in Hull located around 12 km to the south west.

East Riding of Yorkshire Council undertakes non-automatic air quality monitoring, although the nearest stations are around 10 km from the Application site around Hornsea. No automatic monitoring is undertaken by the Council. It is considered that there are no monitoring stations within the area considered to be influenced by releases from proposed operations at the Application site.

The DEFRA air quality archive provides background concentrations considered representative of the assessment area. Available ambient background concentrations of all pollutants of interest within a 1 km of the application site are below 50%, and in most cases well below 50%, of the applicable air quality benchmark providing reasonable headroom for compliance. In view of the low background concentrations of all pollutants of interest it is not proposed to undertake any baseline air quality monitoring.

The Application site is in a rural area and surrounded by open agricultural land. The nearest residential location (High Fosham Cottage) is around 520m to the north west of the Application site.

The Lambwath Meadows site of special scientific interest (SSSI) is around 0.9 km to the north east of the Application site, with the nearest European designated site (Hornsea Mere special protection area) around 8km to the north.

At the SSSI, which is most likely to be influenced by releases from the Application site, the background concentration of nitrogen oxides is around 40% of the critical level, while background concentrations for nutrient nitrogen and acid deposition are either just above or just below the respective critical loads.

Pollutant impacts and effects

The use of temporary diesel powered generators and engines for drilling operations will result in localised releases of nitrogen oxides, carbon monoxide, particulate matter, volatile organic compounds and sulphur dioxide and some greenhouse gases (e.g. carbon dioxide, methane and nitrous oxide). In addition, the use of heavy machinery during site construction and the movement of both light and heavy duty vehicles for transportation throughout the project will also entail release of pollutants typical of diesel use. Disposal of produced natural gas by flaring will also give rise to similar releases, while fugitive releases will largely comprise methane.

The releases are generally low level which is expected to result in the greatest air quality impact being confined to the immediate Application site and close surrounding area with rapid attenuation of concentrations with distance from the site.

No significant impact in terms of human health is anticipated at this location in view of the anticipated attenuation of process contributions with distance from the site.

It is considered unlikely that there will be any significant ecological impact in relation to critical levels or critical loads at the SSSI, although it is expected that process contributions to nitrogen and acid deposition will be close to, or may just exceed, screening criteria.

The release of greenhouse gases over the duration of the project is likely to be in the range 30,000 to 50,000 tCO2e. The release is not considered significant in view of the expected limited timescale of the project and is equivalent to around 0.01% of the UK's 4th annual carbon budget.

Fugitive releases have the potential to give rise to odour due to the presence of sulphurous compounds, although loss of amenity is considered unlikely in view of the short duration, low level releases and distance to the nearest residential location.

Mitigation measures and residual effects

All on site equipment will be sized appropriately for site energy requirements and operated efficiently in order to reduce emissions of pollutants and greenhouse gases. Vehicles arriving or working on site will be parked with engines off when not in use.

Drilling operations, where diesel fuel usage will be greatest, will last for around 12 weeks per well. As such the operations associated with the most significant impacts will be relatively short in duration.

Mitigation measures, adhering to industry best practice, specific to the control of dust during construction will be incorporated into the design of the development.

Best industry practice for loss prevention, including initial testing and ongoing inspection and maintenance will be employed to minimise fugitive releases.

The most affected areas will be close to the Application site and limited in extent due to the low level of the release which results in a localised impact and rapid attenuation with distance. Sensitive human and ecological receptors are at a distance where process contributions are anticipated to have diminished to a concentration at which no significant air quality impact is likely.

4.6 Residential and Recreational Amenity

Amenity could be compromised by noise, odour, vibration, light-spill or glare. In addition, the outlook from a residential properties, private garden or viewpoint could be adversely impacted by operational development. Given the relative remoteness of sensitive receptors, the limited number of viewpoints which overlook the Site and the temporary nature of construction and drilling process, the effects of the proposed development upon amenity are not likely to be significant.

4.7 Ecology, Nature Conservation and Biodiversity

Assessment Criteria and Methodology

Schedule 4 of the 2017 EIA Regulations requires description and assessment of the aspects of the natural environment, including fauna and flora, likely to be significantly affected by development. To address this, the applicant commissioned a Phase 1 Habitat survey and Preliminary Ecological Appraisal (PEA) of the proposed development site, which was undertaken in accordance with standard guidelines published by the Chartered Institute for Ecology and Environmental Management (CIEEM) (CIEEM, 2019). This assessment was undertaken in spring 2020 and the data collected will form the baseline for an ecological impact assessment that will be undertaken in accordance with standard CIEEM guidelines (CIEEM, 2019).

Baseline Environment

A desk-based search was undertaken for statutory internationally designated sites of nature conservation importance within 10 km, nationally designated sites within 2 km, non-statutory locally designated sites within 1 km, and records of protected and/or notable species within 1 km of the

WND development. Information was obtained from the Multi-Agency Geographical Information for the Countryside (MAGIC) database and North and East Yorkshire Ecological Data Centre (NEYEDC). The desk-based study identified one statutory nationally designated site within the search area; Lambwath Meadows Site of Special Scientific Interest (SSSI) approximately 950 m north-east, and one international statutory designated site, Hornsea Mere Special Protection Area (SPA), approximately 9.5 km to the north.

All habitats within the red line application boundary and adjacent land were inspected and mapped in accordance with the standard Phase 1 Habitat survey methodology (JNCC, 2010) in spring 2020. This survey confirmed that the development site is within arable farmland and as such it is unlikely to support any protected species. However, potential was identified for protected species to occur in association with boundary habitats (ditches and hedgerows).

Surveys for the following relevant protected species are ongoing at the proposed development site in the 2020 survey season:

- Bats – a series of bat activity surveys are being undertaken to characterise bat activity in habitats around the proposed development. Surveys are being undertaken in accordance with standard survey methods (Collins, 2016) with three walked transects across the active season (one each in spring, summer and autumn respectively), supplemented by three corresponding periods of remote detector deployment for a minimum of five nights; and
- Water vole (Arvicola amphibius) – a survey of the ditch adjacent to the proposed development in accordance with standard survey method (Strachan et al., 2016); one survey in spring and one survey in summer/ autumn.

Surveys for the following species, for which potentially suitable habitat is present within or adjacent to the proposed development site, were scoped out:

- Great crested newt (Triturus cristatus) – there are no ponds within the proposed development site or within 250 m of the site, so great crested newt is not likely to occur within terrestrial habitats and is not a potential constraint. Ditch habitats are also scoped out for this species on the basis of unsuitability as they are typically dry for much of the year;
- Reptiles – the ditch habitat may be suitable for foraging grass snake (Natrix helvetica); however impacts on the ditch will be limited to minor works associated with the installation of a culvert to facilitate site access, and therefore any potential impacts can be adequately mitigated through precautionary working methods;
- Breeding birds – the arable habitat may support ground nesting species but overall there is a relatively limited suite of habitats that are suitable for nesting birds. There is no potential for Schedule 1 species to be nesting within the zone of influence of the proposed development. A full breeding bird survey is therefore not considered necessary to support the EcIA, and precautionary mitigation will be implemented during site clearance works;
- Badger (Meles meles) – there is no suitable habitat for badger within the proposed development site, and no signs of badger were recorded during the Phase 1 Habitat survey; and
- Brown hare (Lepus europaeus) – likely to be widespread throughout the local area. Potential impacts on the species are minimal and can be adequately mitigated through precautionary mitigation adopted for breeding birds.

No other protected species constraints are considered likely based on the findings of the PEA.

There were no limitations to the undertaking of surveys (where access was granted) due to government restrictions imposed to contain the spread of COVID-19.

Potential Impacts and Effects

Given the low ecological value of the habitats within and adjacent to the proposed development, there is limited potential for significant adverse effects on ecology features to arise. Informed by the scope of the ecological assessment undertaken previously for the consented and comparable

wellsites within the West Newton gas field, and the results of the ecological survey work undertaken to date for the proposed development, the following topics will be scoped into the EcIA:

- Potential indirect impacts (air quality, water quality and hydrology) on Lambwath Meadows SSSI – the proposed development is within the Impact Risk Zone of the SSSI;
- Potential direct and indirect impacts on habitats; and
- Potential direct and indirect impacts on protected species including:
    - potential light and visual disturbance to off-site foraging nocturnal animals, including bats and barn owl (Tyto alba); and
    - Potential noise and visual disturbance to brown hare and breeding birds.

There is no potential for impacts on Hornsea Mere SPA. The SPA is a freshwater lake designated for its wintering populations of gadwall (Anas streptera), goldeneye (Bucephela clangula), pochard (Aytha ferina), shoveler (Anas clypaeta), tufted duck (Aytha fuligula) and mute swan (Cygnus olor). Given that the proposed development is approximately 9.5 km away from the lake, it is considered unlikely that the fields within the study area would support aggregations of mute swan such that they could be reasonably considered to be functionally linked to the Hornsea Mere SPA. The other species for which the site is designated would not reasonably be encountered in terrestrial habitat away from the lake, and the proposed development is not within the identified IRZ.

Mitigation Measures and Residual Effects

Mitigation measures will be determined as necessary following the completion of the ecological survey programme in spring/ summer 2020 and will be based on the measures agreed for other consented well sites in the West Newton gas field. Such mitigation is likely to include the following:

- Topsoil stripping within arable land outside the breeding bird season (March to September inclusive), or a pre-construction check for any evidence of nesting birds prior to commencement of topsoil clearance;
- As above, but with reference to breeding brown hare and dependent leverets;
- Pre-construction check of the banks of the ditch for grass snake prior to works to culvert to facilitate site access; and
- Sensitive lighting design to minimise light spillage outside the proposed development boundary.

If water vole is identified as present on the adjacent ditch, mitigation will be implemented to meet legislative requirements in respect of this species. This may require work to the ditch/ culvert to be undertaken under a Natural England class licence held by a suitably qualified and licensed ecologist.

The arable farmland in which the proposed development will be located will be restored to its current use upon completion of the proposed development.

Biodiversity enhancement measures proportionate to the impacts of the scheme on ecological features will be identified to meet planning requirements. These are likely to include proposals for the installation of nest boxes in suitable locations, and the re-planting of hedgerow sections with a mixture of native canopy species to increase diversity.

References

CIEEM (2017) Guidelines for Preliminary Ecological Appraisal. Available online: https://cieem.net/resource/guidance-on-preliminary-ecological-appraisal-gpea [accessed June 2020]

CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine. September 2018: updated September 2019. CIEEM, Winchester.

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edition. Bat Conservation Trust, London

Joint Nature Conservation Committee (2010) Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough

Strachan, R. Moorhouse, T. & Gelling, M. (2016) Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit

4.8 Traffic, Transport and Access

Assessment Criteria and Methodology

The wellsite would be accessed via the existing private access track which serves the existing West Newton B wellsite, a new access track, to be constructed as part of the development, and the use of existing private access tracks.

During site construction (Phase 1) two-way HGV movements would be up to 10 per day. The magnitude of change this will introduce will be tempered by the temporary nature of the activity (i.e. a 14-week duration) and further diluted by embedded mitigation (on-site holding bays, passing places,) and mitigation to be committed (management of flows, HGV communication strategies and traffic signage regimes). This mitigation is predictable and proven and can be relied upon to reduce residual effects to non-significant levels.

During drilling activity (phase 2) the two-way HGV movements would be up to 10 per day, which is not significant in the context of the local highway network and it's carrying capacity. During the predicted 26-week duration of testing, two-way HGV movements would be up to 5 per day which is not significant.

Mobilising and demobilising the drilling rig and/or workover rig and the delivery of some components of plant and machinery ancillary to the drilling operation would engage abnormal load vehicles. However, the number of movements is very low and any such movements would be the subject of management plans designed to avoid peak-hour travel times, provide escort where necessary and rely on the steerage of experienced banksman. This mitigation is predictable and proven and can be relied upon to reduce residual effects to non-significant levels.

A Transport Statement will record the traffic movements during the four phases of the proposed development and assess the effects of operational activity on the local road network. The assessment will be informed by Government Guidance: Travel Plans, Transport Assessments and Statements in Decision Taking, and the Institute of Environmental Management and Assessment Guidelines for the Environmental Assessment of Road Traffic. The statement will accompany any future planning application and inform the assessment of landscape, visual, ecology, noise and air emissions impacts and the assessment of cumulative impacts.

4.9 Cultural Heritage and Archaeology

There are no World Heritage Sites, Scheduled Monuments, Registered Parks and Gardens or Registered Battlefields within 1km of the Site. There are two Listed Buildings within 1km all of which are Grade II Listed with the nearest being Low Fosham Farmhouse approximately 250m to the east and Mount Pleasant Farmhouse approximately 410m to the south. Withernwick Conservation Area is approximately 1.88km to the north. The nearest Scheduled Monument is Burton Constable medieval settlement and field system approximately 2.3m to the northeast. The separation distances achieved between the Site and these assets is sufficient to find that any effects of the proposed development are unlikely to materially compromise the significance these assets derive from their setting.

The area immediately to the north of the proposed development contains archaeological remains of three bronze Age barrows and the deserted medieval village of Fosham, although these sites are not

designated in any form. It is possible that unrecorded subsurface remains could be located within the Site; an initial assessment finds that any remains are unlikely to be of national significance. Subject to an appropriate scheme of investigation there would be no significant effects. An assessment of effects will accompany a planning application to establish planning policy compliance.

4.10 Waste

All phases of the development will generate waste but the effects of this activity and the subsequent treatment processes engaged would not be significant. As demonstrated at other hydrocarbon exploration, testing and appraisal sites across the UK, the adverse effects of development activity have been mitigated to non-significant and acceptable levels through the adoption of considerate construction plans and method working statements. Drilling would generate extractive wastes, including drilling muds, water and rock cuttings, of such low volumes that the effects of their temporary containment prior to removal are not likely to be significant. The management of extractive waste is regulated by the Environment Agency under the 2016 EPR Regs.

4.11 Population and Human Health

Wellsite construction (phase 1) drilling, testing and appraisal (phase 2) engages activities and engineering processes that could potentially impact upon human health (primarily that of on-site workers). As demonstrated at other hydrocarbon exploration, testing and appraisal sites across the UK, such effects are not significant and can be managed and mitigated to non-significant and acceptable levels.

Drilling would give rise to impacts derived from the recovery, temporary storage and subsequent transportation of hydrocarbons via road tankers. However, these activities would be regulated by the oversight of the Health and Safety Executive, Environment Agency permits and Highway Agency transport plans ensuring the health of on-site operatives and the wider general population would not be compromised. Decision takers can assume that these non-planning regimes would operate effectively to address the effects of hydrocarbon exploration, testing and appraisal. Human health effects are not likely to be significant.

4.12 Risk of Major Accident and/or Disaster

Risks derived from external sources are not considered likely or significant. As demonstrated at other hydrocarbon exploration, testing and appraisal sites across the UK, deep drilling and the recovery of resource at surface has taken place with no unplanned effects or events that varied materially from those predicted. At all stages of the development, independent over-sight ensures compliance with the regulatory regimes in place to secure site safety and environmental protection. In taking this Site forward the same environmental management systems and non-planning regimes will be in place to ensure that risks are managed to non-significant and acceptable levels.

4.13 Socio Economics

The proposed development will generate employment in related trades, benefit the local economy through the procurement of services and supplies and support agricultural diversification. The potential for adverse effects on local tourism and other sectors will be low, given the remoteness of the Site and it's effective screening from the majority of public vantage points. Overall, the effect of hydrocarbon exploration, testing and appraisal will not be significant.

5. POTENTIAL CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

There are no planning consents of a scale and nature within a 5km radius of the wellsite likely to result in any cumulative impact, therefore there is no scope for any significant cumulative effects.

The existing WNA and WNB wellsites are within 5km of the proposed wellsite; these will be taken into account as part of the baseline. The West Newton A and West Newton B wellsites are temporary exploration wellsites expiring in 2021 and 2022 respectively. Any extension to these sites will be subject to a further planning application, which will include a cumulative assessment of any consented and unbuilt wellsites within the study area.

WND exploration site planning application will be submitted alongside the WNC planning application. The location of WNC is approximately 2km to the south of WND. Both sites will share the existing access and egress route, a private track, to the WNB wellsite. Similar to WNA and WNB each site (WNC and WND) will be explored incrementally rather than simultaneously, therefore reducing the cumulative impact from a shared access route.

The environmental reports which will support the future planning application will consider a reasonable worst-case scenario. The assessment will consider incremental development iwhich may include simultaneous drilling (phase 2D) and testing (Phase 2E) at both sites e.g. drilling at WND and testing at WNC.

6. EIA SCREENING COMPLIANCE CHECKLIST

Table 14 presents the 2017 EIA Regs Schedule 3 in full and demonstrates where, within this Report, the criteria has been addressed.

Table 14: EIA Screening Compliance

EIA Schedule 3 Criteria		Applicant Response
Characteristics of Development		
1	The characteristics of development must be considered with particular regard to—	
	(a) the size and design of the whole development;	Chapter 2: Description of the Site and Surroundings and Chapter 3: Description of the Proposed Development
	(b) cumulation with other existing development and/or approved development;	Chapter 5: Potential Cumulative Impacts of the Proposed Development
	(c) the use of natural resources, in particular land, soil, water and biodiversity;	Chapter 3: Description of the Proposed Development
	(d) the production of waste;	Chapter 4.11: Waste
	(e) pollution and nuisances;	Chapter 4.2: Lighting Chapter 4.3: Noise and Vibration Chapter 4.4: Ground and Groundwater Protection Chapter 4.5: Air Quality, Climate and Climate Change Chapter 4.8: Traffic, Transport

		and Access
	(f) the risk of major accidents and/or disasters relevant to the development concerned, including those caused by climate change, in accordance with scientific knowledge;	Chapter 4.12: Risk of Major Accident and/or Disaster
	(g) the risks to human health (for example, due to water contamination or air pollution).	Chapter 4.11: Population and Human Health
Location of Development		
2	The environmental sensitivity of geographical areas likely to be affected by development must be considered, with particular regard, to—	
	(a) the existing land use;	Chapter 2: Description of the Site and Surroundings
	(b) the relative abundance, quality and regenerative capacity of natural resources in the area;	Chapters 4.1 – 4.10 record the baseline environment within each of the assessment topics. The potential impacts and effects are then informed by an appropriate assessment of the capacity of the environment to accommodate the proposed development.
	(c) the absorption capacity of the natural environment, paying particular attention to the following areas— (i) wetlands, riparian areas, river mouths; (ii) coastal zones and the marine environment; (iii) mountain and forest areas; (iv) nature reserves and parks; (v) European sites and other areas classified or protected under national legislation; (vi) areas in which there has already been a failure to meet the environmental quality standards, laid down in Union legislation and relevant to the project, or in which it is considered that there is such a failure; (vii) densely populated areas; (viii) landscapes and sites of historical, cultural or archaeological significance.	The assessments performed within Chapters 4.1 – 4.13 address the potential impacts and effects of the proposed development within its immediate setting and the wider landscape paying proper regard to designated areas and other natural and built assets.
Types and Characteristics of the Potential Impact		
3	The likely significant effects of the development on the environment must be considered in relation to criteria set out in paragraphs 1 and 2 above, with regard to the impact of the development on the factors specified in regulation 4(2), taking into account—	
	(a) the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);	The assessments performed within Chapters 4.1 – 4.13 address the extent, magnitude, complexity and probability of the impact where appropriate prior to performing an assessment of
	(b) the nature of the impact;	

		the likely significance of the effects.
	(c) the transboundary nature of the impact;	The proposed development is not likely to generate any significant trans-frontier impact.
	(d) the intensity and complexity of the impact;	
	(e) the probability of the impact;	
	(f) the expected onset, duration, frequency and reversibility of the impact;	The temporary and reversible nature of the impacts likely to be generated by this proposed development are relied upon as material mitigation.
	(g) the cumulation of the impact with the impact of other existing and/or approved	

The proposed development falls under Schedule 2 of the 2017 EIA Regs as being 'Extractive Industry' development comprising either category 2.d) 'Deep drillings' or 2.e) 'Surface industrial installations for the extraction of… petroleum'

NPPG provides indicative thresholds which are intended to help determine whether significant effects are likely. The relevant extracts for these categories are shown in Table 15:

Table 15: NPPG Indicative Thresholds

National Planning Practice Guidance			
Development Type	2017 EIA Regs Schedule 2 Criteria and Thresholds	NPPG Indicative Criteria and Threshold	Key Issues to Consider
2. Extractive Industry			
(d) Deep drillings	(i) In relation to any type of drilling, the area of the works exceeds 1 hectare.	Drilling operations involving development of a surface site of more than five hectares. [Exploratory deep drilling on its own is unlikely to require Environmental Impact Assessment].	Regard should be had to the likely wider impacts on surrounding hydrology and ecology.
(e) Surface industrial installations for the extraction of…, petroleum.	The area of the development exceeds 0.5 hectare.	Development of a site of 10 hectares or more.	Scale of development, emissions to air, discharges to water, the risk of accident and the arrangements for transporting the fuel.

7. SCREENING REQUEST REPORT ASSESSMENT

The proposed development falls under Schedule 2 of the 2017 EIA Regs (development description 2: Extractive Industry). The area of the work at surface is likely to exceed the 1ha screening threshold for 'Deep Drilling' rendering the proposal as 'Schedule 2 development'.

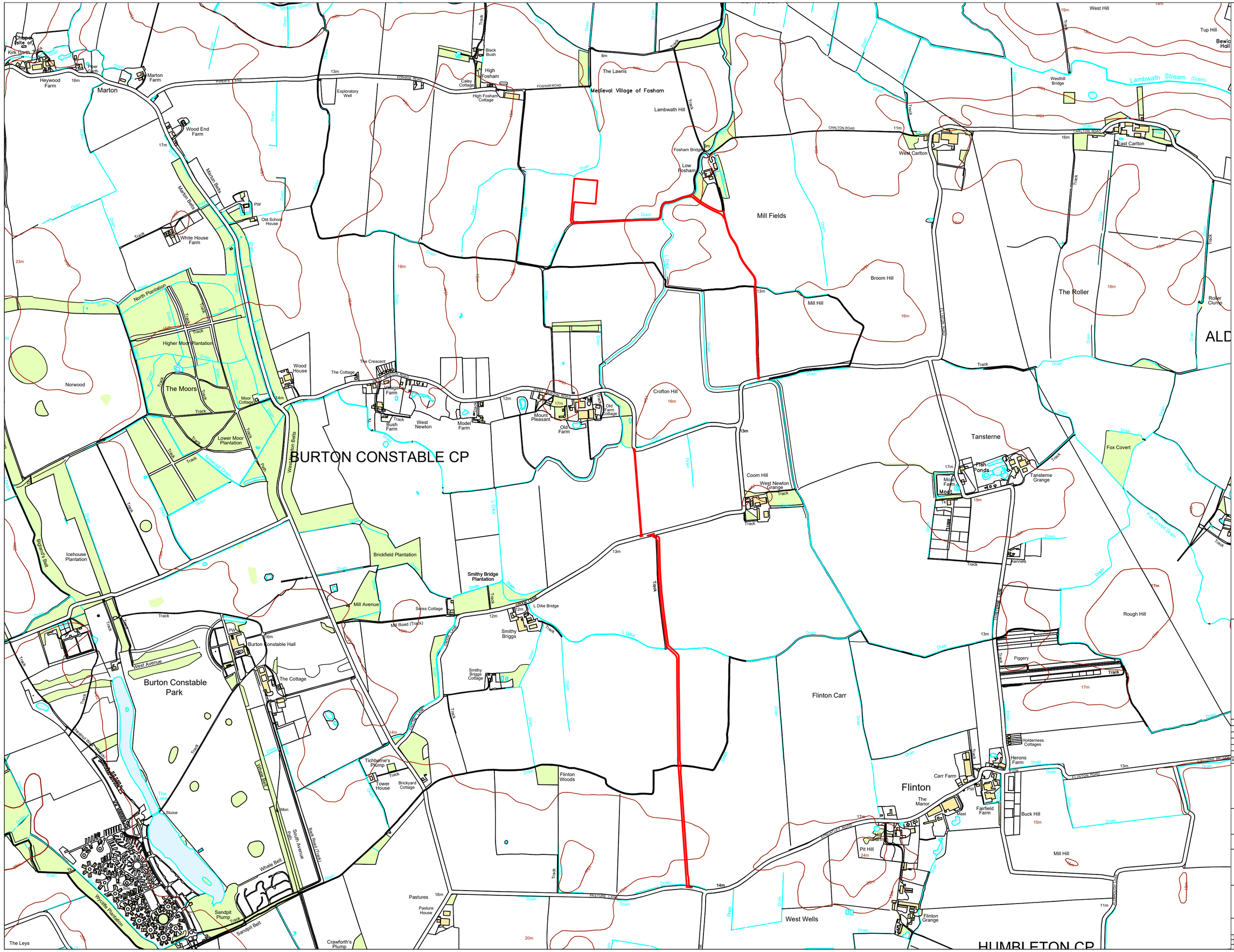
This report has considered the proposed development against the 2017 EIA Regs Schedule 3 'Selection Criteria for Screening Schedule 2 Development' and finds it is not likely to generate significant effects on the environment by virtue of its nature, size or location.

The proposed development falls within the indicative screening thresholds of NPPG which records that exploratory deep drilling on its own is unlikely to require an Environmental Impact Assessment.

The existing West Newton A (reference 18/01888/EIA/SCR dated 6th July 2018) and West Newton B (14/03644/EIASCR dated 9th December 2014) exploratory wellsites, were both screened and deemed not to be EIA.

Taking account of the above, this report finds the proposed development to be non-EIA development.

8. APPENDIX 1



KEY:

- PLANNING APPLICATION BOUNDARY
- WATER FEATURES (PONDS / DRAINS)
- WOODLAND
- CONTOUR LINES (5m ELEVATIONS)

NOTES:

REVISION HISTORY			
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–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
0	JUN20	JF	ORIGINAL FOR ISSUE
REV	DATE	BY	DETAILS

ZETLAND GROUP
FROM CONCEPTION TO COMPLETION
ZETLAND GROUP LIMITED
THE INNOVATION CENTRE, KIRKLEATHAM BUSINESS PARK, REDCAR, TS10 5SH
T: +44(0)1642 777726 E: info@zetlandgroup.com W: www.zetlandgroup.com
Registered in England No: 5594449 Registered office: The Innovation Centre, Kirkleatham Business Park, Redcar, TS10 5SH

SITE:	WEST NEWTON D WELLSITE
PROJECT:	WEST NEWTON D WELLSITE FOR HYDROCARBON EXPLORATION & APPRAISAL
TITLE:	LOCATION PLAN
CLIENT:	RATHLIN ENERGY (UK) LIMITED

Scale:	1:10,000	DWG. No:
Size:	A2	ZG-RE-WND-PA-SRR-02
Sheet:	1 of 1	

KEY:

PLANNING APPLICATION BOUNDARY

WATER FEATURES (PONDS / DRAINS)

NOTES:

REVISION HISTORY

REV	DATE	BY	DETAILS	APR
–	–	–	–	–
–	–	–	–	–
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ZETLAND GROUP
FROM CONCEPTION TO COMPLETION
ZETLAND GROUP LIMITED
THE INNOVATION CENTRE, KIRKLEATHAM BUSINESS PARK, REDCAR, TS10 5SH
T: +44(0)1642 777726 E: info@zetlandgroup.com W: www.zetlandgroup.com
Registered in England No. 05964499. Registered office: The Innovation Centre, Kirkleatham Business Park, Redcar, TS10 5SH

SITE: WEST NEWTON D WELLSITE

PROJECT: WEST NEWTON D WELLSITE FOR HYDROCARBON EXPLORATION & APPRAISAL

TITLE: LOCATION PLAN

CLIENT: RATHLIN ENERGY (UK) LIMITED

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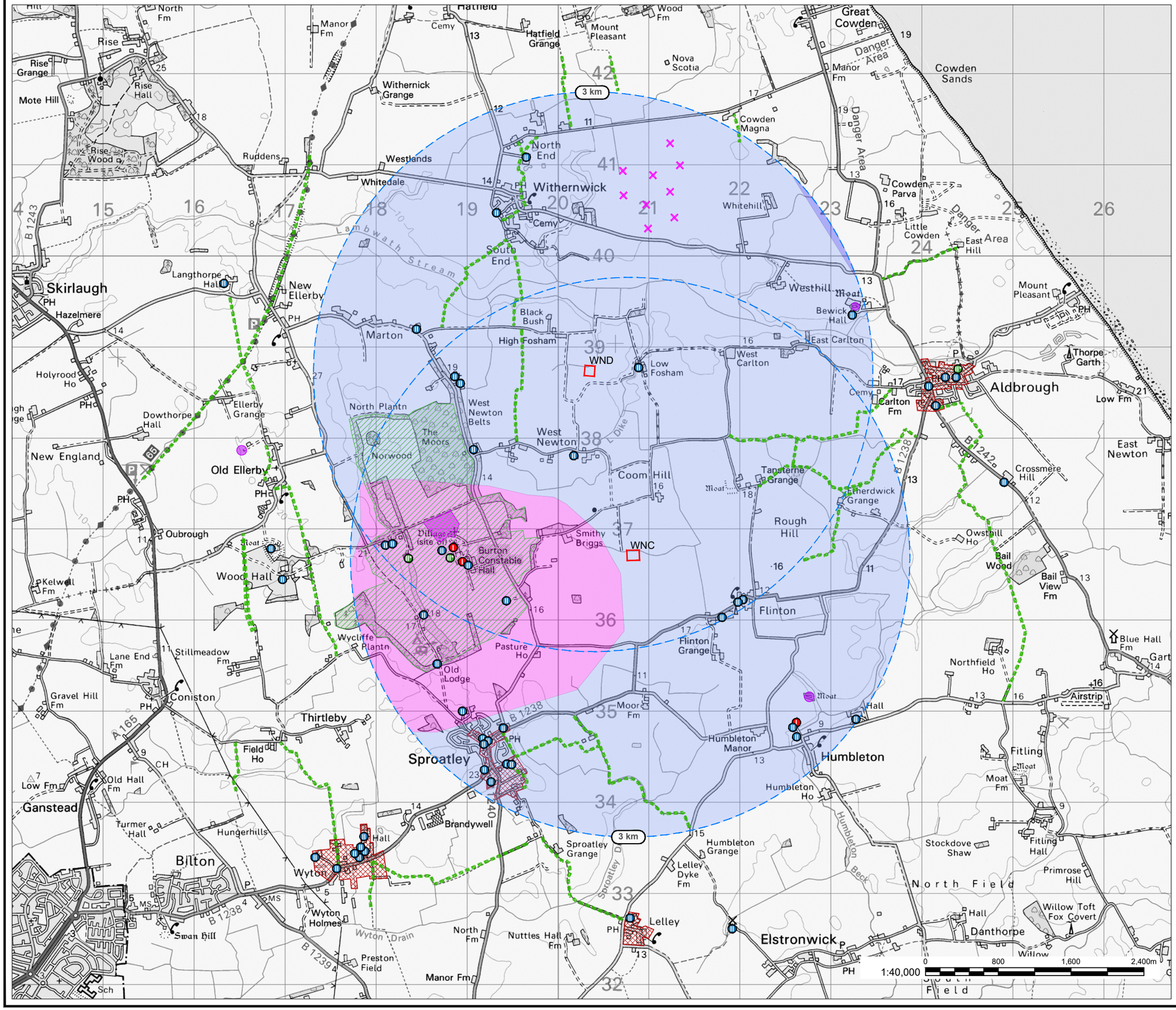
Sheet:	2 of 2	

9. APPENDIX 2



Legend

- 3 km Study Area
- Application Boundary
- Public Right of Way
- Grade I Listed Buildings
- Grade II* Listed Buildings
- Grade II Listed Buildings
- Burton Constable Grade II* Registered Park and Garden
- Conservation Area
- Schedule Monument

Landscape Character Areas
East Riding of Yorkshire, November 2005

- (19B) Burton Constable Farmland & Parkland
- (19D) Central Holderness Open Farmland
- (20B) Hornsea to Withernsea Coast

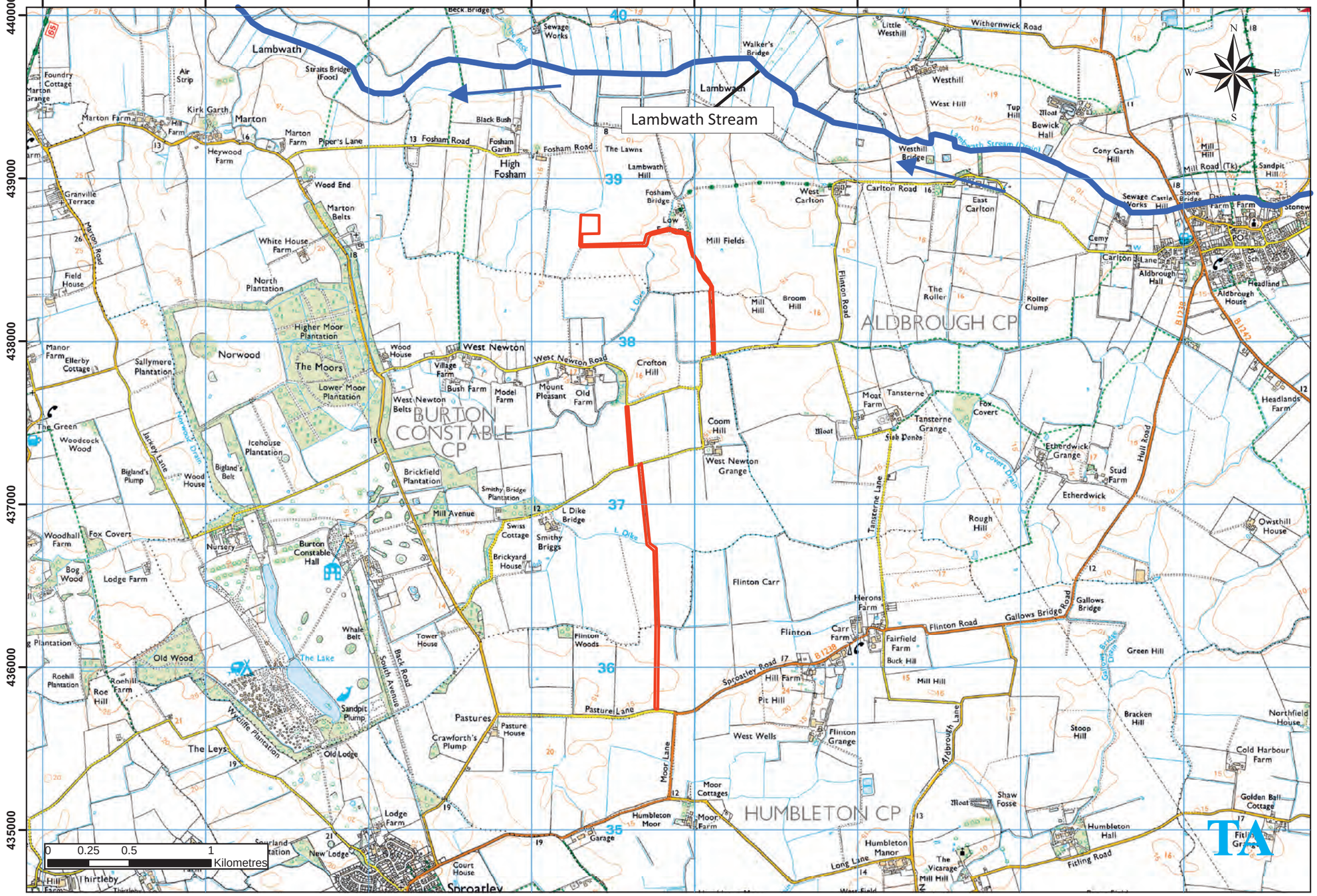
Notable Visual Detractors

- Existing Wind Turbines

Client	Rathlin Energy (UK) Limited
Project	WEST NEWTON WELLSITES WNC & WND Landscape Designations & Constraints
Size	A3
Scale	1:40,000
Date	28.06.20
Created by	CL
Drawing No.	WNC/WND-01
Rev	

DRaW Design & Assessment
Morwick Hall
York Road
Leeds
LS15 4TA
t: 0113 8232871
e: info@draw-ltd.com
www.draw.com

10. APPENDIX 3



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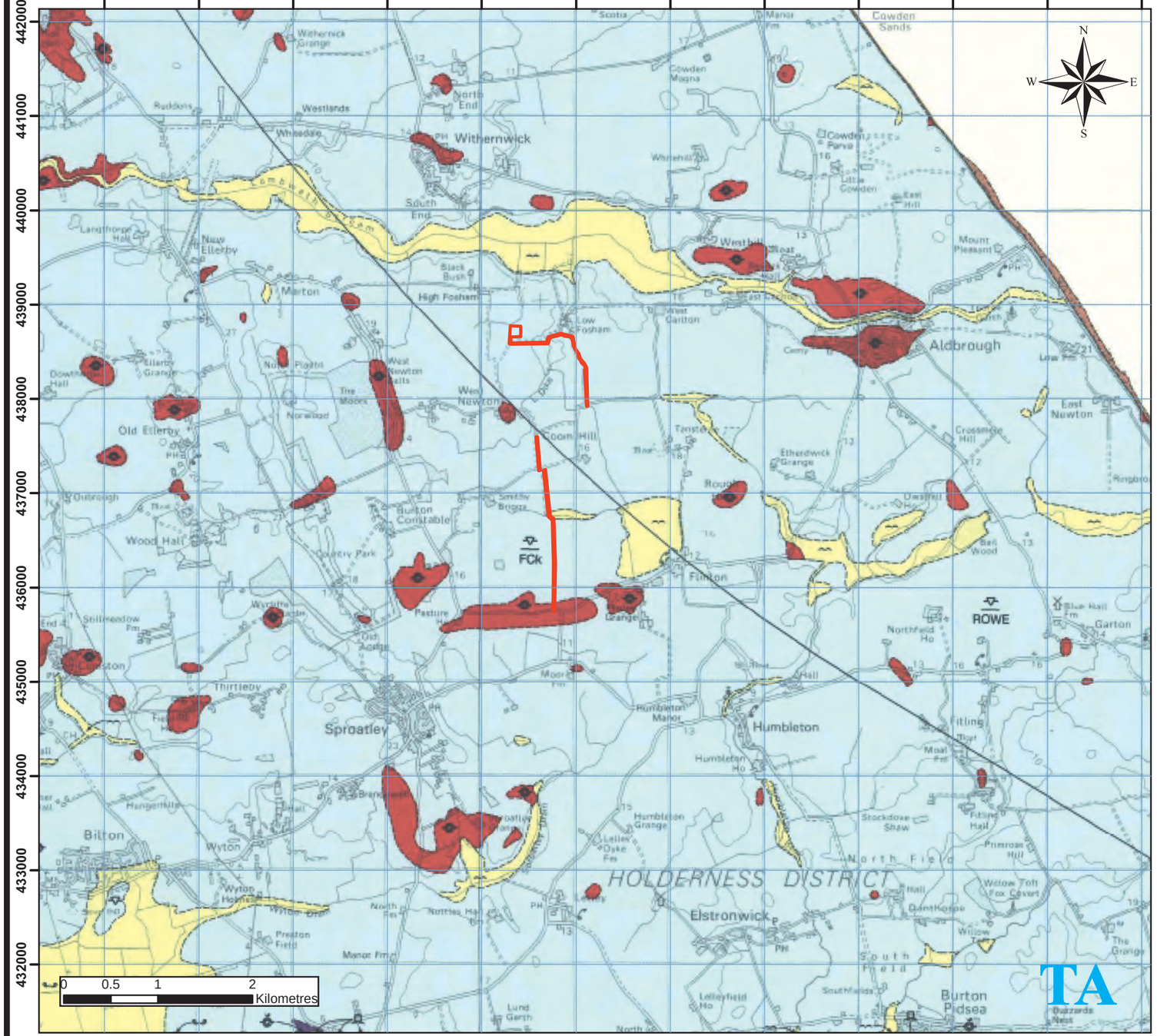
envireau WATER

Ref: P19-035/ Rathlin WN Field Dev/FIG 1
WND Site Location and Setting.cdr
Date: 10/07/2020

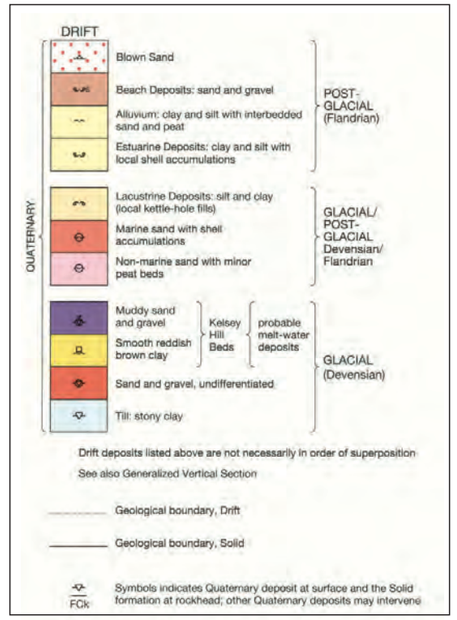
Rathlin Energy

Figure 1

West Newton D: Site Location and Setting



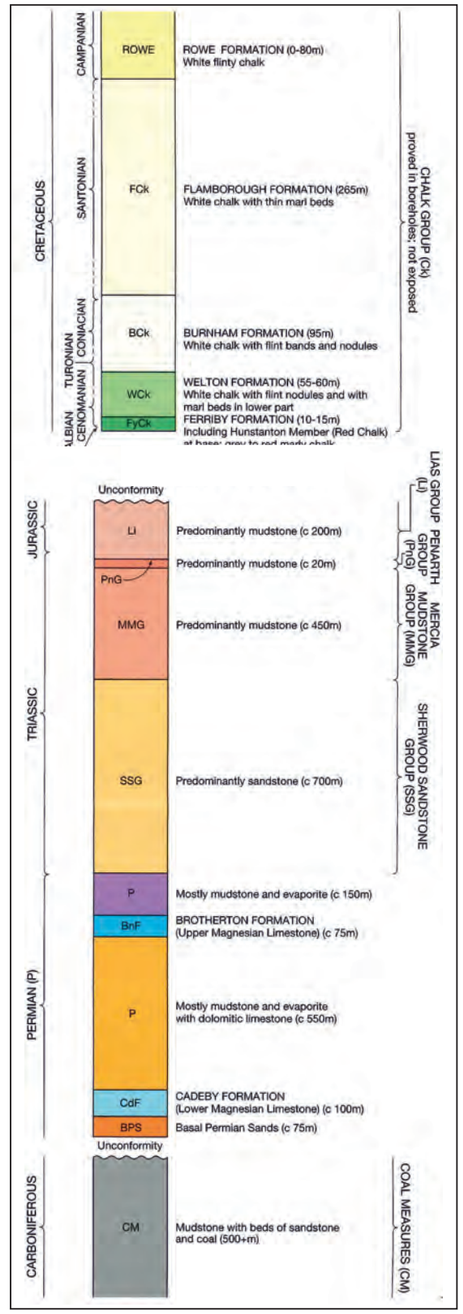
SUPERFICIAL DEPOSITS



KEY

Development Boundary (approx)

SOLID GEOLOGY



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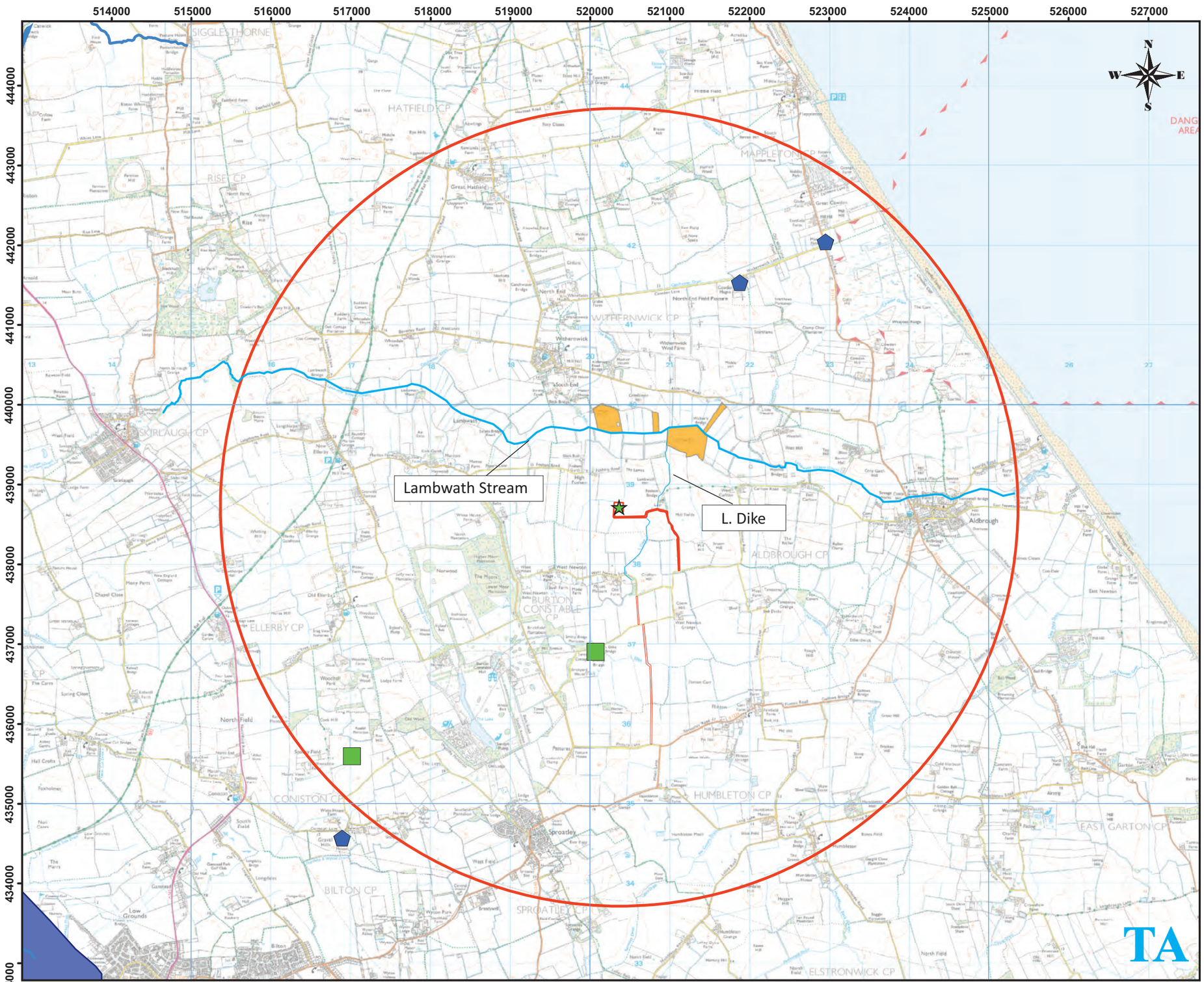
envireau WATER

Ref:P19-035/Rathlin WN Field Dev/ FIG 2 WND Geology.cdr Date:10/07/2020	**Rathlin Energy**
Figure 2	West Newton D: Geological Setting



KEY

- Site Centre
- Development Boundary (approx)
- Historic borehole targeting the Chalk Group
- Historic Borehole targeting the superficial deposits
- Registered PWS
- Watercourse/field drain
- SSSI- Lambwath Meadows
- 5km radius

Scale 1: 50,000 at A3

envireau WATER

Ref:P19-035/ Reporting/ FIG WND Env Setting Screening Date: 14/07/20	**Rathlin Energy**
Figure 3	West Newton D: Environmental Setting