PROPOSED DEVELOPMENT OF KEEKLE HEAD WASTE MANAGEMENT CENTRE, CUMBRIA

ENVIRONMENTAL STATEMENT

Non Technical Summary

December 2009

This report has been prepared in support of the planning application for the Keekle Head Waste Management Centre and has been prepared on behalf of Endecom UK Ltd., the applicant. The application has been co-ordinated by Axis with technical inputs from:

- AXIS – Planning, Landscape, Transportation and Environment
- TerraConsult – Geology, Hydrology, Engineering Design
- Nuvia – Radiological Impact
- Westlakes Scientific Consulting – Health Impact Assessment, Air Quality
- Argus – Ecology and Nature Conservation
- NVC – Noise & Vibration Assessment
- Weetwood – Flood Risk Assessment

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FOREWORD

This Environmental Statement is submitted to accompany a planning application by ENDECOM UK LTD for the development of a Waste Management Facility for low and very low level radioactive waste at the former Keekle Head Open Cast mine, near Pica, Cumbria. The Environmental Statement consists of the following documents:

- Volume 1: Environmental Statement (ES), containing the description of the proposals, an outline of alternatives considered and the predicted environmental impacts of the development and details of the proposed mitigation measures, if any, which will alleviate, compensate for, or remove those impacts identified during the Environmental Impact Assessment (EIA) process.
- Volume 2: Illustrative Figures.
- Volume 3: Technical Appendices.
- A Non-Technical Summary, containing a brief description of the proposals and a summary of the ES findings, expressed in non-technical language.

In addition, the planning application is accompanied by a Planning Statement that sets out the planning policy framework against which the application should be determined. The Planning Statement should be read in conjunction with this ES.

Full copies of the ES and Planning Statement are available at a cost of £200 from AXIS, Well House Barns, Chester Road, Bretton, Chester, CH4 0DH. Alternatively, an electronic version can be provided on a CD-Rom disk at a cost of £15. An unbound black and white copy of the Non-Technical Summary is available free of charge. The Non-Technical Summary is also available on SITA's website www.sita.co.uk by entering 'KeekleHead' in the search engine.

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1.0 INTRODUCTION

1.1 The Proposal

1.1.1 Endecom UK Ltd (the applicant), has submitted an application for planning permission to Cumbria County Council, for the development of a Waste Management Centre for disposal of low and very low level radioactive waste at the former Keekle Head Open Cast mine, near Pica, Cumbria.

1.1.2 The proposed scheme includes restoration of large areas of the landscape that were affected by the open cast operation. The restoration would include putting the River Keekle back close to its original course.

1.1.3 Burial of around 1 million cubic metres of waste would then take place over an operational life span of around fifty years. The wider site would be managed for the benefit of landscape quality and local wildlife for the same period. The general arrangement of the proposed development is shown of Figure NTS2

1.1.4 The proposal would help to reduce the volume of low level waste material that is sent to the repository near Drigg, which is designed to accommodate higher activity waste and only has a limited remaining capacity. In doing this the proposed development would accord with national strategy which aims to preserve the site near Drigg for the UK's future needs.

1.2 The Applicant

1.2.1 Endecom UK Ltd is a wholly-owned subsidiary of SITA UK. The company has been set up to specialise in the disposal of low and very low level radioactive wastes.

1.2.2 The company will provide the best practicable means of processing, treatment and disposal and will investigate and introduce innovative and cost effective solutions to help industry and the country meet their obligations to dispose of waste safely.

1.2.3 SITA UK Ltd has extensive experience of handling and disposing of waste, operates safe and secure facilities in an environmentally responsible manner, ensuring the minimum impacts of disposal in both the short and long term. The company operates in an open and transparent fashion and will engage with regulators, stakeholders and the public to ensure that our operations are fully understood and to encourage participation in our business activities.

1.3 The Site

1.3.1 The former Keekle Head opencast coal mine covers an area of approximately 70 hectares and is located one mile from Pica and five miles from Whitehaven in West Cumbria. The C4006 Pica to Dean Cross Road forms the northern boundary of the site and part of the High Park escarpment forms its southern boundary. The location of the site is shown on Figure NTS1.

1.3.2 The site is located within the administrative area of Copeland Borough Council. The eastern boundary of the site forms the boundary between boroughs of Copeland and Allerdale.

1.4 This Document

1.4.1 This document is the Non Technical Summary of the Environmental Statement (ES), which has been prepared to accompany the planning application. It summarises the findings of an environmental impact assessment of the proposed scheme in non technical language.

1.5 The baseline for the Environmental Impact Assessment

1.5.1 All Environmental Statements describe the effects that a development would have in comparison with the 'baseline' situation. For most projects the baseline is the environment as it is now. However, where permission has already been given to change the current environment, the baseline must take this into account. In the case of Keekle Head, whilst the affected environment is currently an unrestored former opencast site, the site should

have been restored when the coal extraction stopped in accordance with an approved restoration scheme.

1.5.2 Assessments have therefore been made in comparison with a restored site rather than the despoiled site that currently exists. Many of the works that Endecom UK Ltd would undertake to create the proposed development are in effect making good the damage done by the coal extraction. These works and any environmental effects they cause, in effect already have planning consent

1.5.3 In order to present a complete picture of the development and its effects, we have included reference to all of the environmental effects, including those that already have consent. The effects have been subdivided to distinguish between three distinct phases as follows:

- The Restoration phase – all operations required to achieve the 'baseline situation'. (These are the "already consented" effects)
- The Construction phase – works over and above the restoration to achieve the proposed development
- The Operational phase – the day to day activities involved in operating the site.

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Overview

2.1.1 It is proposed to create a facility for the disposal of low and very low level radioactive waste material with an operational life of around fifty years, through the reworking of a site that has been despoiled by open cast coal extraction.

2.1.2 Solid radioactive waste is divided into three broad categories – High, Intermediate and Low levels – according to its radioactivity content and the heat it produces. This development is only concerned with the management of lower activity waste categories. The majority would be in the lowest activity sub-category, known as very low level waste (VLLW), with some waste at the lower end of low level waste (LLW). These categories of waste contain extremely low levels of radioactivity and are classed as low risk.

2.1.3 Typically waste will consist of material resulting from demolition of decommissioned nuclear facilities such as concrete, bricks and excavation material.

2.1.4 The proposed waste management centre **would not** be used for the disposal of any High or Intermediate levels of waste, or for the disposal of any liquid wastes.

2.1.5 If planning approval is gained, the Keekle Head Waste Management Centre would be designed, constructed and operated to the highest technical standard and in accordance with UK and European regulatory requirements under the Radioactive Substances Act (RSA) 1993 and both the nuclear industry and waste management industry best practice. It is likely that the site would also be regulated by the Nuclear Installations Inspectorate (NII) under the Nuclear Site Licence regime plus the RSA regulatory regime. The site would therefore be regulated by both the Environment Agency and the Health and Safety Executive – Nuclear Installations Inspectorate.

2.2 Site Restoration and wildlife benefits

2.2.1 In parallel with the creation of the disposal facility, an extensive land restoration scheme would be undertaken which would include reinstatement of the natural valley of the River Keekle which was diverted to allow coal extraction. The restoration scheme, which is shown on Figure NTS 4 would also include

- extensive areas of wet grassland and pockets of willow and alder woodland
- reinstatement of the former small scale field pattern in the eastern half of the site, with wetlands and ponds within the fields. Fields would be divided by new traditional style hedgerows
- large areas of wildflower grassland
- areas of trees and woodland to screen the development from view
- measures to improve wildlife habitats

2.3 Development stages

2.3.1 The proposed development would involve five main elements:

- Restoration of the site following coal extraction;
- Construction of a purpose built disposal area;
- Construction of other new features including buildings and site roads;
- The careful placing of imported waste; and
- Long term monitoring and maintenance

2.4 Built development

2.4.1 The development would include a large purpose built disposal area. The base of the disposal area and the cover material over the disposal area would both be highly engineered in a number of layers to contain the waste material and prevent water from entering

2.4.2 There would be two main buildings on the site, a Waste Reception Building which would be built to the south east of Wilson Park Farm on the north bank of the restored River Keekle and a weatherproof enclosure which would be sited in the waste placement area.

2.4.3 The Waste Reception Building would provide an enclosed reception area for the checking and recording of all incoming waste before its transfer to the purpose built disposal area. The building would also have visitor and exhibition facilities, offices and staff welfare facilities. The proposed building is shown on Figure NTS3

2.4.4 The weatherproof enclosure would in effect consist of a large, very robust tent structure that would enable all waste to be placed in stable conditions sheltered from wind and rain. The position of this structure would change over time as the active disposal area progresses up the site. The building would be mounted to two parallel steel rails and moved along them using a winch. A crane would be used occasionally (perhaps every 4 or 5 years) to move the structure onto the next set of rails.

2.4.5 The development would also include new access roads, water treatment lagoons, discreet security fencing and a weighbridge with gatehouse.

3.0 SUMMARY OF EFFECTS

3.1 Health Impact

3.1.1 A Health Impact Assessment (HIA) has been carried out by an independent company to examine the potential health impacts of the proposed development. Census data shows that in generally the current health of the populations surrounding the development site is in line with the regional and national averages and overall health could be considered good.

3.1.2 After speaking with local people and specialists (including medical experts and nuclear experts) it was found that peoples main concerns were as follows

Physical Environment Factors:	Socio-economic Environment:
Water pollution	Stress
Traffic / road safety	Employment
Effects of Radiation	Local Economy
Air pollution	Lifestyle
Noise pollution	
Light pollution	

3.1.3 Each of these topics was considered in turn and the findings were as follows

Water pollution & Traffic / Road safety

3.1.4 These two factors were considered by local people to be the two greatest causes for possible concern. However if the development is carried out in line with the proposed plans then there is no direct evidence to suggest that negative health impacts would occur.

Radiation

3.1.5 At present a full radiological risk study for the site has not been conducted (this will take place before Endecom applies for a permit). However health impacts are very unlikely. It has been calculated that the Keekle Head Site would result in a dose of radiation each year that would be similar to what a person would be exposed to during a 4 hour air flight.

Air Quality, Noise and Light

3.1.6 It is considered to be unlikely that health impacts would occur as a result of air pollution, noise pollution or light pollution from this development.

Stress, Employment, the Local Economy and Lifestyle

3.1.7 These three health impacts are all possible and are likely to occur to some extent. Stress could arise if people have fears about the safety of the site. For similar reasons, some people have said that they fear that the site could discourage other companies from creating jobs in the area. Despite the fact that the site is unlikely to have direct effects on people's health, this fear of the 'unknown' needs to be addressed. To tackle this, it has been recommended that Endecom:

- continues to speak with local people to explain how the site will be managed;
- employs local people where possible (who can then help to spread understanding and reduce stress);
- only operates the site in 'normal business hours', with no weekend or night working

3.2 Traffic and Transportation

3.1.8 A Traffic Assessment has been undertaken and demonstrated that the proposed development would not have a detrimental impact on the local highway network.

3.1.9 The assessment found that there would not be a significant impact on road safety or congestion as a result of extra traffic generated by the development.

3.1.10 Even though the scheme would not have significant effects, a number of improvements are proposed in the event that planning permission is granted including:

- New warning signs at the site entrance

- Restrictions on where heavy goods vehicles travelling to and from the site can go, which would avoid this traffic passing through the villages of Pica and Gilgarran.
- A financial contribution to a scheme to reduce speed limits on the road passing the crematorium.

3.1.11 In addition, in response to concerns about the condition of some local roads, a survey is being undertaken by the applicant to examine whether further use by heavy goods vehicles would be detrimental. Any necessary improvements identified by the survey would be agreed with Cumbria County Council and carried out before the site opened.

3.1.12 During restoration of the site and construction of the development a wheel washing facility would be provided to avoid any problems in terms of dust and dirt created by site traffic.

3.3 Landscape and Visual Effects

3.3.1 A landscape and visual assessment of the proposed development has been undertaken using nationally recognised guidance

3.3.2 It is considered that the proposal would lead to a marked improvement in the type and quality of landscape elements on the site.

3.3.3 The effects of the proposed development on the character of the landscape of the area would not be significant in EIA terms. The development site is generally very well contained by surrounding landform so that its influence does not spread further than one or two kilometres.

3.3.4 The Lake District National Park would not be affected by the proposed development. Any views that are possible are very distant and the site would be barely visible if at all.

3.3.5 Visual effects would be limited to views experienced by a small number of properties and vantage points that are close to the site. From these locations, some potentially significant visual effects would be experienced when compared to the site as it would be if it had been restored following

the open cast development. It is considered however that these effects would not be unacceptable.

3.3.6 The design of the project includes measures to reduce potential adverse landscape and visual effects and an extensive landscape restoration scheme that would improve the quality of the landscape and would be completed early and managed long term.

3.4 Ecology and Nature Conservation

3.4.1 The impacts of the proposed development on plants and wildlife have been examined. The assessment found that a number of species and habitats protected by law could be affected if care and attention isn't taken to their requirements. The impacts with potential to be important include:

- *The River Ehen Site of Special Scientific Interest which includes a population of freshwater pearl mussels*: this population is some way downstream of the development. This is a low and avoidable risk but would be a high significance impact, because of the importance of the population;
- *Impacts on hen harrier*: Hen harriers are rare birds of prey that spend part of the year close to the site. This is again an impact risk which can be avoided, but is of high significance because of the importance of the local population;
- *Impacts on common lizard*: Common Lizard are not especially common, despite their name. There appears to be small and localised population on the edge of the site. Care will have to be taken to avoid impacts during restoration works;
- *Impact on grasshopper warbler*: 3 pairs of this quite rare bird were observed on or near the site and could potentially be affected. This is over 1% of the total Cumbrian population, but there is a good potential for avoiding the 2009 breeding sites and the restoration scheme would make the site more attractive for this species in the medium to long term;
- *Impacts on reed bunting*: This is another quite rare bird. Habitat quality and population size on the current site is good. The proposals

have been designed with this and other species in mind and retention of key marshy grassland areas and creation of new areas should be effective;

- *Impacts on ponds and dragonfly populations*: There is a good variety of dragonflies on the site. Some ponds on the site have resulted from hollows left on the site by the coal workings. It has been recognised that the loss of these ponds would potentially affect dragonflies and other species including common toad. As a result, the scheme proposals include for the creation and management of new ponds and other wetland habitats.

3.4.2 The greatest potential effects would happen as the coal site is restored using large earth moving equipment to remove overburden mounds and backfill voids. The later construction of buildings and the waste disposal area would have lesser effects. The operational of the development would have only occasional and localised impacts.

3.4.3 Measures are proposed that will prevent protected species from being harmed or disturbed during the restoration and construction phases. Also, a large area of land will be restored and subsequently managed for nature conservation benefit. It is anticipated that this will create an increase in the amount and variety of wildlife at the site and fully compensate for any minor losses of habitat that occur during the restoration.

3.5 Noise and Vibration

3.5.1 During the restoration and construction periods of the development, noise levels would vary from day to day depending upon a number of factors including type of machines being used, type of activity, distance from existing residents, the duration of activity, screening and nature of activity.

3.5.2 In general, there would be no discernible change in existing noise conditions. Depending upon the type and number of machines being used, occasionally there could be a small change in existing overall noise conditions for a relatively short duration.

3.5.3 In terms of vibration transferred through the ground it is concluded for the assessment of impact that there would be no perceivable vibration experienced at the nearest residential properties.

3.5.4 Once the site has been built and is operating, site measures and work methods would be put in place to control noise from the site. The provision of such measures would assist in minimising any noise impact. Noise from the site in operation is therefore not expected to create any discernible change in existing overall noise conditions at the nearest residential properties.

3.6 Air Quality

3.6.1 The primary effects on air quality due to the proposed development relate to vehicle exhaust emissions and fine dust. These pollutants could be produced by construction vehicles & machinery on the site and by goods vehicles and cars travelling to and from the site. In addition, there is the potential for dust to arise from excavations and other operations involved with site preparation and construction.

3.6.2 The levels of these pollutants at sensitive locations along the access route to the site have been established using a Highways Agency model. The modelling has been performed for the current conditions as well as for the development: during site restoration (2012), during earth works and construction (2014) and during operation (2015). For each of these years a comparison has been made of what the air quality would be with, and without, the development.

3.6.3 For all situations it was found that the air quality would be well within the national standards set for the protection of human health and the natural environment.

3.6.4 It is recognised that some dust would be produced due to the nature of the existing site and the re-development work. The majority of the time, the wind blows from the south west, and as such any dust on the site is most likely to travel towards properties to the north east such as Keekle Head

farm and the former Greyhound pub. However, the planned establishment of vegetation at an early stage would bind the surface material and reduce production of dust in the longer-term. Where conditions exist that are more likely to result in dust (e.g. dry weather) methods would be put in place to reducing the production of dust.

3.7 Geology and Hydrogeology

3.7.1 A detailed site investigation has been carried out to inform an assessment of the potential impacts of the proposed development on the ground and groundwater environment at the site. This provided a comprehensive understanding of the nature and distribution of the various superficial deposits and rock strata present, and of the extent and effects of historical coal mining in the area. A good understanding of the movement of groundwater in the locality has also been reached and was used to inform the design of the proposed facility. Groundwater monitoring equipment has been installed to allow an ongoing programme of sampling and testing, so that the performance of the proposed engineered containment systems can be checked over the long term.

3.7.2 In relation to the geology of the site the main issues considered were those associated with earlier opencast mining. Detailed research into the potential for underground mine workings on the site was also carried out. This confirmed that no such workings remain or are present under the proposed development.

3.7.3 The previous opencast mining activities resulted in deep, steep sided holes which have then been partially infilled. The steep side walls have potential to affect the safe construction of the proposed facility and its long term performance. Consideration has therefore been given to the stability of the rock faces and the diverted river channel, particularly during the early site restoration works and the potential for settlement to affect the development in both the short and long term. The following measures are to be adopted to ensure there are no adverse environmental impacts arising as a consequence of these factors;

- Location of structures that could be affected by settlement away from the buried steep walls of the quarry;

- Use of highways engineering methods to ensure than replaced overburden materials are well compacted to reduce settlements;
- Stability assessments will be undertaken to confirm that during the emptying of water from the large holes and then during backfilling the sidewalls remain stable;
- Additional compacted material will be installed under area where waste will be deposited to further reduce potential for settlement;
- Design of the new bed of the realigned River Keekle will be engineered to ensure that it is will not be affected by settlement where it crosses over the infilled opencast workings; and
- Where materials are to be stockpiled during the works these piles will be designed for stability and located away from surface water systems

3.7.4 The potential for the production and movement of gases within the waste after it has been deposited was also considered in this section of the impact assessment. Landfilled wastes have the potential to produce gases such as methane, carbon dioxide and hydrogen whilst radioactive wastes can emit radon and tritium. The waste types that would be accepted at the site would have a low organic content which means that gas production would only occur in minor quantities. Anything that is produced will be contained within each landfill cell by a lining system. The little gas that is expected to be produced will be collected and managed in a controlled manner.

3.7.5 In relation to groundwater, the main issues considered were the potential for groundwater to be contaminated by liquid draining out of the wastes and the physical effects of groundwater pressures on the proposed engineered containment systems. To reduce the potential for contamination one of the main influences on the design of the facility and way it operates was to reduce leachate production. This is to be achieved primarily by working under a weatherproof cover to keep rain water out and then by capping the wastes with material that doesn't allow water to pass through it. The pollution potential from any liquid that might be produced is to be kept to a minimum by strict rules on the types of waste accepted at the site to ensure that only relatively inert materials (e.g. low organic content and solubility) are deposited. The range of radioactive material will also be restricted to that

which would not give rise to an unacceptable off-site health risk even were it to migrate into groundwater.

3.8 Surface Water

3.7.6 Consideration has been given to the potential impacts to the surface water on and adjacent to the proposed development. In the first instance studies were undertaken to describe the surface water regime at various times in the life of the site; as it is currently, during construction, during operation and following closure. The studies considered the potential flood risk impacts, the effects of moving the course of the River Keekle, the potential for contamination during construction and the potential for pollution once filling activities commenced.

3.7.7 A formal Flood Risk Assessment (FRA) was carried out which took account, in particular, of government guidance on development and flood risk. Modeling software was used to calculate the maximum flows of water from the site and those arising following the river realignment. It was concluded that the realignment would have no impacts downstream of the site.

3.7.8 A surface water management plan has been drawn up to show how the quality and flow rate of water draining from the facility at the various stages in its development would be controlled. In preparing this the principles of Sustainable Drainage Systems (SUDS) were adopted and modelling software used to assist in the design of lagoons of the correct size to hold back temporary high volumes of rain water. The main measures to be adopted include;

- Provision of surface water settlement / balancing lagoons;
- Controlled emptying of the currently flooded excavations;
- Provision of carefully considered drainage systems to direct and manage the flow of water both during the works and afterwards;
- Progressive restoration of completed areas;
- Provision of engineered containment of the landfilled wastes;
- Control of landfill leachate production and leachate quality;

- Adoption of good site management techniques including fuel spillage control, regular cleaning of roads and strict separation of clean and contaminated water; and
- A programme of water quality monitoring throughout the life of the site

3.7.9 It is concluded that following adoption of these measures that there would be no adverse effect on the surface water environment and that the design of the redirected River Keekle would enhance the ecological and visual amenity of the locality.

3.9 Archaeology and Cultural Heritage

3.9.1 An assessment of the archaeology of the site was made in 1998 before the open cast operation started. All but two of the features that were identified in this study were destroyed by the mining operation. The two sites that were not destroyed are outside the area that would be affected by the proposed Waste Management Centre

3.9.2 There is a stone circle to the north of the site which is designated as a scheduled ancient monument. Whilst there would be changes in the views from this site, it is considered unlikely that these changes would be relevant to the special qualities of the setting of the monument as they would not break the skyline or intrude on long distance views.

3.10 Socio Economic Impact

3.10.1 The development would provide both short term and long term jobs both on the site itself and in local companies that would provide services to the site. As such it would provide a degree of financial injection into the local economy. The project would also provide support to the nuclear decommissioning and new build industry which plays a very significant part in the west Cumbrian economy.

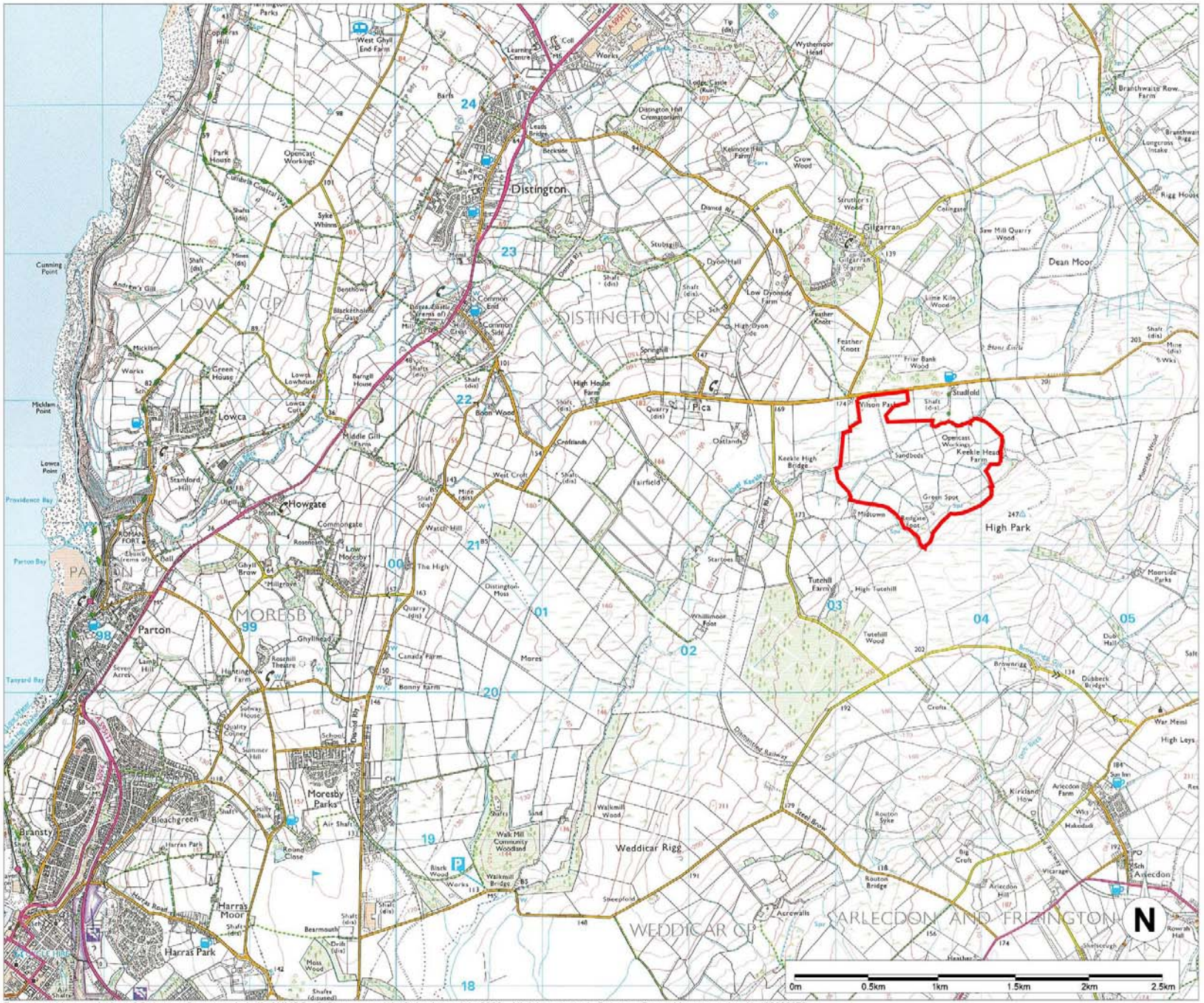
3.10.2 It is not envisaged that the proposed development would give rise to any negative impacts from a socio-economic perspective.

3.11 Cumulative Effects

3.11.1 The main potential for cumulative impacts would occur relates to other construction activity that could possibly happen at the same time as this development, resulting in extra traffic on the roads.

3.11.2 It is possible that this could happen if a nearby wind farm development at Fairfield Farm, south of Pica, was built at the same time as the proposed Waste Management Centre.

3.11.3 In the event that both projects took place at the same time, which is considered unlikely, the additional traffic may have a noticeable combined effect for a temporary period.



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axis

Site Location

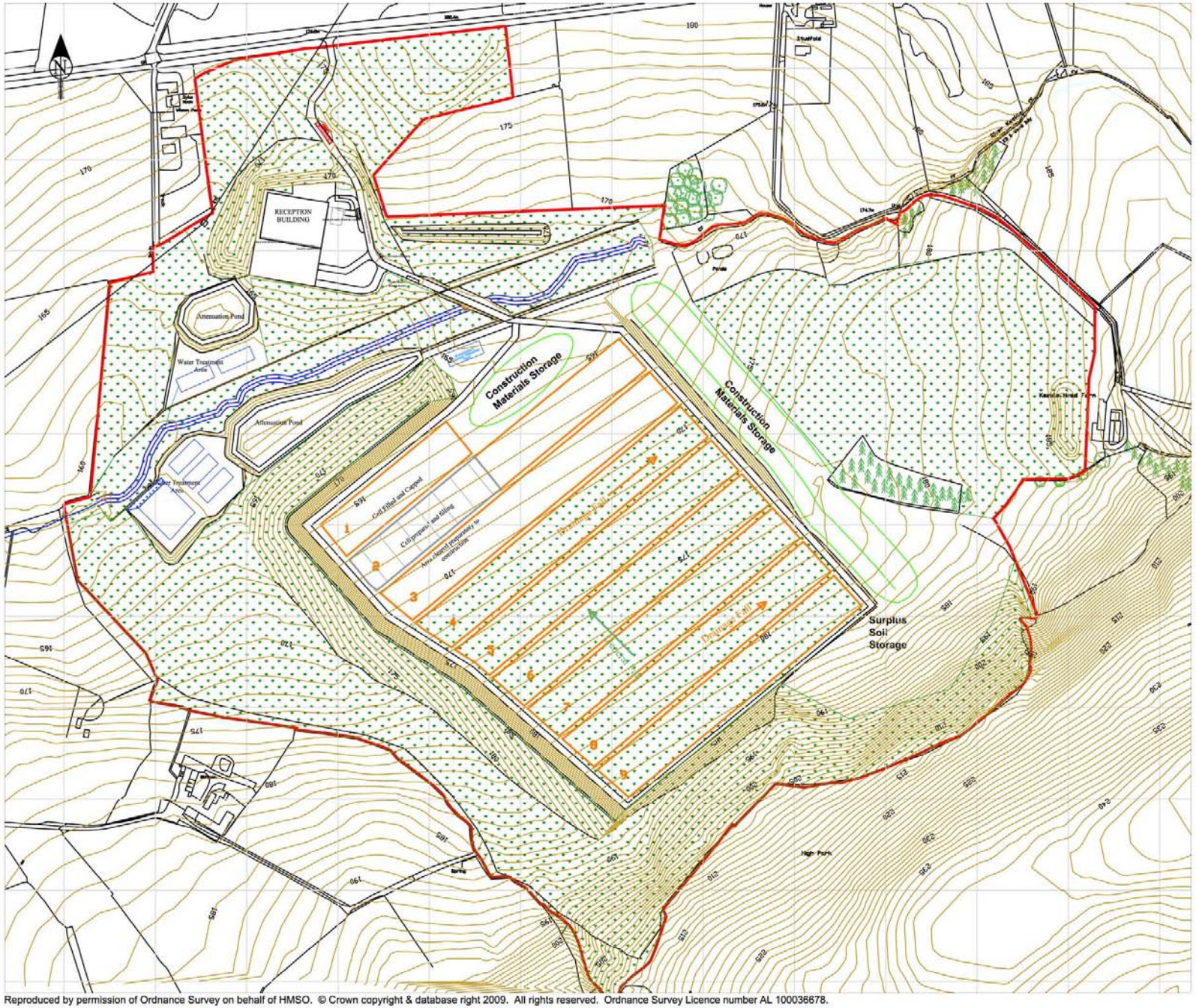
Endecom UK Ltd

KEEKLE HEAD WASTE MANAGEMENT CENTRE

Figure NTS 1

Site Location Plan

Scale	Date
1:25,000@A3	November 2009



TerraConsult

axis

Key

- Original and Restoration Contours
- Site Boundary
- Existing Woodland
- Restored or Temporarily Restored Areas
- Weatherproof Enclosure
- River Keekle Diversion
- Landfill Phase Outline

This view of the site is at the commencement of filling in Phase 2.

Based on a survey supplied by SITA January 2009

Endecom UK Ltd

KEEKLE HEAD WASTE MANAGEMENT CENTRE

Figure NTS 2

Proposed General Arrangement

Scale	Date
1:4,000@A3	November 2009

DAY CUMMINS ARCHITECTS SURVEYORS

axis

Endecom UK Ltd

KEEKLE HEAD WASTE MANAGEMENT CENTRE

Figure NTS 3

Waste Resception Building Elevations

Scale	Date
1:300@A3	November 2009

axis

- Reinstated pasture
- Woodland / Scrub mix
- Gorse scrub
- Willow / Alder scrub
- Hedgerows
- Existing Willow carr
- Conifer plantation (drowned)
- Wet grassland
- Existing areas of biodiverse wetland
- Conservation grassland
- Wet scrapes
- Proposed footpath alignment
- County Wildlife Sites
- Road / Hardstanding
- 2.4m Palladin Security Fence

Endecom UK Ltd

KEEKLE HEAD WASTE MANAGEMENT CENTRE

Figure NTS 4

Landscape Restoration Plan

Scale	Date
1:5000@A3	November 2009