10 CULTURAL HERITAGE

10.1 INTRODUCTION

10.1.1 Terms of Reference for this Chapter

This chapter presents an assessment of the likely significant effects on cultural heritage from construction, operation and decommissioning of the Keadby II project (henceforth the ‘Proposed Development’). The baseline cultural heritage interests of the Proposed Development site are described, potential effects identified, proposed mitigation measures listed and an assessment of the significance of residual effects is made.

Potential impacts of the Proposed Development upon cultural heritage assets comprise:

- direct physical damage to the fabric of cultural heritage assets, generally resulting from groundworks associated with the construction of the Proposed Development, but also potential secondary impacts from changes to groundwater levels or soil chemistry; and
- adverse impacts upon the setting of cultural heritage assets, largely as the result of visual impacts;
- adverse impacts on the historic landscape.

Undesignated assets are considered in addition to Scheduled Monuments, Listed Buildings, World Heritage Sites, Conservation Areas, Registered Parks and Gardens and Registered Battlefields. Conservation Areas and Registered Parks and Gardens are also considered within the Landscape and Visual Impact Assessment of the ES.

10.1.2 Basis for the Assessment including the Realistic Worst Case Scenario

The Proposed Development could damage or destroy any buried archaeological remains that exist within the area of construction groundworks as defined by the maximum extent of the red line boundary.

During construction it will cause a number of temporary effects to cultural heritage receptors arising from the removal of existing vegetation, topsoil stripping, the presence of site compounds and the presence of construction plant, including drilling rigs and tall cranes.

Once constructed, the Proposed Development will have permanent effects on the setting of cultural heritage receptors due to its scale and size. These effects are discussed in Section 10.4.3.

The assumed maximum heights of the tallest proposed structures are 85m for the stack and 25m for the cooling towers.
There will be a discharge of cooling water from the Proposed Development site to the River Trent via an existing outfall. The new pipework will either be inserted through the current outfall pipe or laid in the existing wayleave. Since the wayleave has been previously disturbed installing the much larger outfall pipe for the direct cooled Keadby I station there is very little scope for impacts to buried archaeology. It will however be subject to the same good construction practice mitigation measures (e.g. watching brief) as the other works. This element of the Proposed Development is therefore scoped out of further consideration.

10.1.3 Consultation

SSE has undertaken and continues to carry out various formal and informal consultation activities as part of the s36 variation application.

Consultation to date on the topic of cultural heritage has comprised the following (and is summarised in Table 10.1):

- Scoping as set out in the Scoping Opinion (Annex B);
- a telephone conversation on April 21, 2014 with the North Lincolnshire Historic Environment Record Officer following receipt of the NLCC scoping response regarding HER data, previous surveys and the preferred approach for the heritage assessment of the impacts of the Keadby II proposals; and
- correspondence with the archaeological advisors of North Lincolnshire Council in September 2015, following the submission of a desk-based archaeological assessment.
<table>
<thead>
<tr>
<th>Source</th>
<th>Consultee Comment</th>
<th>Response and Where Addressed in ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Lincolnshire</td>
<td>I welcome the approach in the scoping report to undertake desk based assessment including the settings of heritage assets; this should include consideration of the indirect and cumulative impacts on the historic landscape of Isle of Axholme Special Historic Landscape (saved local plan policy LC14) and I would welcome the opportunity to discuss and agree a detailed scope of content for the desk based and settings assessment with your specialist heritage consultant. It should be noted that additional monuments have been recorded within the immediate vicinity of the proposed site on the North Lincolnshire HER (not Lincolnshire HER as quoted twice in the scoping report) since your heritage consultant's initial request for a data search in February.</td>
<td>See baseline Section 10.3.5; impact assessment Sections 10.4.3 and 10.4.5 Subsequent telephone and email correspondence with NLC HER office has confirmed all relevant HER data has been collected.</td>
</tr>
<tr>
<td>Council</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historic England</td>
<td>Historic England is aware that developments of the scale proposed can be challenging to the historic environment. Guidance on the conservation of heritage assets and their setting is contained within the National Planning Policy Framework, the NPPF Planning Policy Guidance, Conservation Principles (Historic England 2008) and in good practice advice notes produced by Historic England on behalf of the Historic Environment Forum including Managing Significance in Decision-Taking in the Historic Environment and The Setting of Heritage Assets. Historic England guidance can be downloaded from <a href="http://www.helm.org.uk">www.helm.org.uk</a>. The guidelines are designed to be used alongside other current standard methodologies associated with the development of such proposals.</td>
<td>Assessment methodology is set out in Section 10.2 and policy context in Section 10.1.4.</td>
</tr>
<tr>
<td></td>
<td>In general terms, Historic England advises that a number of considerations will need to be taken into account when proposals of this nature are being assessed (this includes consideration of the impact of ancillary infrastructure):</td>
<td>Ancillary infrastructure in the form of the cooling system pipelines is fully considered (see Sections 10.4.2 and 10.5.1) See Sections 10.3.2 and 10.4 See Sections 10.3.4 and 10.4.2 See Sections 10.3.6 and 10.4.3 See Section 10.3.4</td>
</tr>
<tr>
<td></td>
<td>• The potential impact upon the landscape, especially if a site falls within an area of historic landscape;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Direct impacts on historic/archaeological fabric (buildings, sites or areas), whether statutorily protected or not. All grades of listed buildings should be identified;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Other impacts, particularly on the setting of listed buildings, scheduled monuments, registered parks and gardens, conservation areas etc, including long views and any specific designed views and vistas within historic designed landscapes. In some cases, inter-visibility between historic sites may be a significant issue;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The potential for buried archaeology;</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Consultee Comment</td>
<td>Response and Where Addressed in ES</td>
</tr>
<tr>
<td>--------</td>
<td>------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td></td>
<td>Effects on landscape amenity from public and private land; Cumulative impacts</td>
<td>See Chapter 13 See Section 10.4.5</td>
</tr>
<tr>
<td></td>
<td>Such information would usually be expected to be presented as part of any planning application in a document such as an Environmental Assessment or Visual Impact Assessment, including the production of a Zone of Theoretical Visibility (ZTV) in line with the appropriate guidance. The ZTV of the proposed development should initially be based on topographical data before the impact of existing trees and buildings etc on lines of sight is assessed. Finally, the effects of proposed mitigation measures on the ZTV should be demonstrated. We also recommend that photomontages and wireframes are produced for key viewpoints concerning cultural heritage. While it is possible to identify some viewpoint locations at the outset, it is advisable to retain some capacity to add and revise viewpoint locations in case unforeseen implications emerge during the assessment process.</td>
<td>A joint site visit was made by a qualified archaeologist and a visual impact specialist during which viewpoints were selected. Further information on methodology is provided in Chapter 13 and Section 10.2.3</td>
</tr>
<tr>
<td></td>
<td>Given the scale of the proposed scheme, it could result in significant negative impacts on the setting and significance of designated heritage assets and the impacts may extend further than 5km. This is particularly the case for prominent, historic churches. From a brief review of our own records, it is apparent that there is 1 scheduled monument, Keadby Lock, and 1 listed building at Grade I, St Oswald, Althorpe, within 5km of the proposed scheme. At this stage we would draw your attention to the potential impact on these designated heritage assets as well as the church of St Oswald, Crowle (listed Grade I). Any impact upon them would need to be fully assessed.</td>
<td>See Sections 10.3.6 and 10.4.3 (and also Chapter 13)</td>
</tr>
<tr>
<td></td>
<td>The assessment should include any views from the churches and towards churches in which the proposed scheme and the church would be visible. The assessment of the impact on the setting and significance of the designated heritage assets should also include consideration of the cumulative effects on all the designated heritage assets affected by the proposed scheme.</td>
<td>See Sections 10.4.3 and 10.4.5</td>
</tr>
<tr>
<td></td>
<td>Details of all nearby designated heritage assets, including grade II listed buildings the impact on which is more a matter for the local authority, can be found on the National Heritage List for England. The North Lincolnshire Historic Environment Record, which holds information on undesignated archaeological remains, should be consulted.</td>
<td>Noted and data sources referenced (see Sections 10.2.2 and 10.3)</td>
</tr>
</tbody>
</table>
Policy, Legislation and Guidance

Policy relevant to the Proposed Development is set out in Chapter 3 of this ES. The table below identifies those policies that are relevant to cultural heritage.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Archaeology and cultural heritage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overarching National Policy Statement for Energy (EN-1)</td>
<td>5.8 Historic environment</td>
</tr>
<tr>
<td>National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)</td>
<td>-</td>
</tr>
<tr>
<td>National Planning Policy Framework (NPPF)</td>
<td>12 Conserving and enhancing the historic environment</td>
</tr>
<tr>
<td>Planning Practice Guidance (PPG)</td>
<td>Conserving and enhancing the historic environment</td>
</tr>
<tr>
<td>North Lincolnshire Local Plan</td>
<td>Historic environment policies LC14, HE5, HE8, HE9</td>
</tr>
<tr>
<td>North Lincolnshire Core Strategy</td>
<td>CS6 Historic environment</td>
</tr>
</tbody>
</table>

National Planning Policy Framework

The NPPF states that “heritage assets are an irreplaceable resource”. It advises that, when considering the impact of proposed development on the significance of a designated heritage asset, great weight should be given to the asset’s conservation. The NPPF sets out different policy approaches to be applied to cases where a proposed development will lead to substantial harm or total loss of significance of a heritage asset (paragraph 133), and those where the proposed development will lead to less than substantial harm to the significance of a designated heritage asset (paragraph 134).

The approach to non-designated assets is different, with paragraph 135 of the NPPF stating that “The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.”

Where heritage assets are permitted to be damaged or lost, developers are required by paragraph 141 of the NPPF to “record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible”.

Significance’ is defined in the glossary to the NPPF as:

“Significance (for heritage policy): The value of a heritage asset to this and future generations because of its heritage interest. That interest may be
archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting.”

Local Planning Policy

North Lincolnshire planning policies relating to the historic environment that are relevant to the current application include the following saved policies from the 2003 Local Plan.

- LC14: Isle of Axholme Area of Special Historic Interest states that development within the area will not permitted if it would destroy, damage or adversely affect the character, appearance or setting of the historic landscape. Its northern boundary lies c.2 km south of the Keadby power station site.

- HE5: Development affecting Listed Buildings states that proposals which will damage the setting of a listed building will be resisted.

- HE8: Ancient Monuments states that development that will result in an adverse effect on Scheduled Ancient Monuments or their settings will not be permitted.

- HE9: Archaeological Evaluation encourages the provision of adequate assessment of the significance of archaeological remains in support of planning proposals and states that sites of known archaeological importance will be protected through the provision by the developer of adequate provision for excavation and recording before and during development.

Although the Secretary of State will not be considering whether to grant planning permission, but considering whether to direct that deemed planning permission be granted, the duty imposed by section 66(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990, should be borne in mind. Section 66(1) provides: “(1) In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.” Parliament’s intention in enacting section 66(1) was that decision makers should give considerable importance and weight to the desirability of preserving the setting of listed buildings when carrying out the balancing exercise inherent in making planning decisions(1).

10.1.5 Supporting Information for this Chapter

This chapter is based on a detailed desk-based study (Annex H) and walkover carried out on March 26-27, 2015.

(1) Barnwell Manor Wind Energy Limited v. East Northamptonshire DC [2014] EWCA Civ 137 at paragraph 29
10.2 ASSESSMENT METHODOLOGY

10.2.1 Introduction

Overview

This cultural heritage assessment comprises a baseline survey (documentary research and site walkover) followed by an assessment of the direct and indirect effects of the construction, operational and decommissioning phases of the Proposed Development.

The assessment comprises the following stages:

- identification of heritage assets potentially affected by the Proposed Development;
- selection of assets that require assessment;
- definition of baseline conditions;
- identification of potential effects resulting from the Proposed Development;
- assessment of importance of cultural heritage assets potentially affected by the Proposed Development;
- assessment of the magnitude of identified impacts;
- assessment of the significance of effects;
- identification of the need for mitigation and recommendations for mitigation;
- assessment of significance of residual effects; and
- assessment of cumulative effects.

Study Areas

HER data were collected within a radius of 1.5 km of the Proposed Development, which therefore comprises the core study area. Beyond that, heritage information was considered relating sites and settlements extending across the Isle of Axholme and beyond. When considering impacts on the settings of heritage assets, an inner study area of 2.5 km was used, although consideration was given to more prominent designated buildings extending out to 7.5 km from the project site (as requested by Historic England).

10.2.2 Baseline Data Acquisition

Data Sources for Desk Study

The baseline for the inner study area has been informed by a comprehensive desk-based study, based on all readily available documentary sources, following the Chartered Institute for Archaeologists’ (CiFA) Standard and Guidance for archaeological desk-based assessment. The following sources of information were referred to:

- North Lincolnshire Historic Environment Record;
- Lincolnshire Archives;
- Headland Archaeology, who provided reports of their surveys carried out in support of the Keadby Wind Farm; and
- other readily accessible published sources.
Field Survey

A visit to the power station and heritage assets in the surrounding area was undertaken on March 26th to 27th, 2015. Designated assets whose setting might be affected by the proposed development were visited and, where appropriate, photographs taken to enable computer visualisations of visual impacts to be generated (see Chapter 13, Viewpoints 1b and 2).

10.2.3 Impact Assessment Criteria

General Considerations

The assessment involved the following steps:

- the identification of potentially affected archaeological assets/resources;
- an assessment of impacts on the archaeological resource based on the Project design; and
- consideration of the significance of the effects including indirect, secondary and cumulative effects taking into account previous disturbance and the importance of the known and potential archaeological heritage.

Direct Physical Impacts

Direct physical impacts on buried archaeological remains could result from ground disturbance associated with the construction of the Proposed Development. The extent of any such impacts will depend on the existence of archaeologically significant remains on the site, and the extent of any previous disturbance, for example as the result of the construction of the present or previous power stations.

Impacts on Setting

The setting of a cultural heritage asset should be thought of as the way in which the surroundings of a historic asset or place contribute to how it is experienced, understood and appreciated (1). This includes its local context, embracing present and past relationships to the adjacent landscape (2). The extent of a setting is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral (3).

The methodology for assessing physical impacts and impacts on the setting of cultural heritage assets is set out in Figure 10.1. Based on the ZTV and subsequent site visits, the Project will be visible from a number of designated sites within the study area, and will therefore result in potential effects from changes in setting.

## Impact Assessment Methodology: Physical Impacts

### Receptor Importance and Types of Cultural Heritage Assets

<table>
<thead>
<tr>
<th>Receptor Importance</th>
<th>Sites of little or no importance, including:</th>
<th>Sites of former architectural features</th>
<th>Unlisted buildings of minor historic or architectural interest</th>
<th>Poorly preserved examples of particular types of feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible</td>
<td>• Archaeological sites and areas of limited importance and potential structural damage.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>• World Heritage Sites</td>
<td>• Scheduled Monuments</td>
<td>• Historic Parks and Gardens of national significance (e.g. Grade II in England &amp; Wales)</td>
<td>• Archaeological sites and areas of distinctive regional importance</td>
</tr>
<tr>
<td>Medium</td>
<td>• Sites of Regional importance, including:</td>
<td>• Listed Buildings of the highest levels of importance (e.g. Grade III in England &amp; Wales)</td>
<td>• Historic Parks and Gardens of national significance (e.g. Grade II in England &amp; Wales)</td>
<td>• Archaeological sites and areas of distinctive regional importance</td>
</tr>
<tr>
<td>High</td>
<td>• Sites of national and international importance, including:</td>
<td>• World Heritage Sites</td>
<td>• Scheduled Monuments</td>
<td>• Historic Parks and Gardens of national significance (e.g. Grade II in England &amp; Wales)</td>
</tr>
</tbody>
</table>

### Magnitude of Change

<table>
<thead>
<tr>
<th>Magnitude of Change</th>
<th>Negligible</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Negligible</td>
<td>Measurable but non-material changes to the cultural heritage asset.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>Small part of the site is lost or damaged, resulting in a loss of scientific or cultural value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>A significant portion of the site is lost or damaged, resulting in a loss of scientific or cultural value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Large</td>
<td>Fundamental changes to the cultural heritage asset. The entire site is damaged or lost, resulting in nearly complete or complete loss of scientific or cultural value.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Contribution of Setting to Significance of Cultural Heritage Assets

<table>
<thead>
<tr>
<th>Contribution of Setting</th>
<th>Very High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Negligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Very High</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>Negligible</td>
</tr>
<tr>
<td>Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### An overall level of effect that is ‘Negligible’ or ‘Minor’ is assessed as ‘Not Significant’

<table>
<thead>
<tr>
<th>Overall Level of Effect</th>
<th>Receptor Importance</th>
<th>Magnitude of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Moderate</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### Impact Assessment Methodology: Effects on Setting

<table>
<thead>
<tr>
<th>Importance of Receptor</th>
<th>Contribution of Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Negligible</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Overall Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Large</td>
<td>Major</td>
</tr>
<tr>
<td>Large</td>
<td>Moderate to Major</td>
</tr>
<tr>
<td>Medium</td>
<td>Moderate to Major</td>
</tr>
<tr>
<td>Small</td>
<td>Minor</td>
</tr>
<tr>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

### An overall level of effect on setting of ‘Negligible’ or ‘Minor’ is assessed as a ‘Not Significant’ effect.
Impacts on historic landscape are also considered. These are based on the characterisations and criteria set out in the Lincolnshire Historic Landscape Characterisation report (2011) and that produced by the Isle of Axholme Historic Landscape Characterisation Project (1997).

10.3 **Baseline Conditions**

10.3.1 **Site Topography**

The Proposed Development site lies on the Isle of Axholme close to the west bank of the River Trent on the western edge of North Lincolnshire. It is situated in an area of low-lying flat arable farmland lying immediately west of the historic riverside village of Keadby in the Parish of Althorpe with Keadby. Before the late eighteenth/early nineteenth century, the site fell within a large area of historic sand and peat moorland, between the higher ground of Crowle to the west and the Trent to the east. The landholding associated with the Proposed Development site, with a width of 300-500 m, extends eastwards nearly 2 km from the western boundary of the parish. The site of the gas turbines and administrative buildings on the eastern side of the site is separated by the historic Chapel Lane from the more extensive area of former ash ponds and coal storage to the west. The southern boundary of the site is formed by North Soak Drain that runs beside the South Yorkshire railway line and the Stainforth and Keadby Canal immediately to the south.

The eastern part of the Proposed Development site is situated immediately to the west of the existing Keadby I gas-fired power station. It is predominantly an open area currently covered by hard-standing, used as car-parking, as well as areas of grass. The eastern part of this area was formerly the site of the workshop and stores building of the original coal-fired power station built in 1952 and demolished in the early 1990's.

The western part of the Proposed Development site falls within the former coal yards to the west of Chapel Lane. This area is currently unused and is mainly made up of areas of partially overgrown hard-standing and scrub, with the remains of former railways tracks still visible on its southern side.

10.3.2 **Geology and Geoarchaeology Background**

The drift geology underlying the Proposed Development site comprises a deep sequence of late Pleistocene and Holocene clays, sands, silts and, in places, peats. The latter, and other deposits containing organic remains, are of particular potential value in that they preserve information about past environments (pollen, palaeobotanical remains, insects etc.), and can contain well-preserved archaeological remains providing ideal samples for scientific dating. This sequence reflects the low-lying, wetland character of the surrounding landscape, and the influence of the River Trent, less than 750 m east of the project site.

During the early post-glacial period, the early Trent flowed in braided channels across a wide alluvial plain, forming sand levees. This was then followed by a phase of deep channel incision estimated to date between c.9,000 and 5,500 BC. A palaeochannel identified at Amcotts, to the north of Keadby, was cut to
depths of up to 11 m below the current floodplain. The character of the Trent at this time - an active river in a wide sandy floodplain - led to the development and periodic abandonment of channels and the adoption of others, leaving behind localised areas of swamp/peat.

As sea-levels approached modern levels around 6,000 years ago there was an acceleration of sediment deposition in the Trent Valley, as the result of impeded fresh-water runoff. From around 3,800 BC onwards there is increasingly widespread evidence from across the Trent levels of the development of wetland marsh and peat. In later periods into the early medieval period until around 1,000 AD, there is widespread evidence for raised mires extending eastwards from Crowle towards the river. The final phase of the alluvial sequence across the floodplain around Keadby is marked by the characteristic presence of rich silty-clays produced by warping \(^{(1)}\) in the post-medieval period.

This regional picture has been brought into sharper focus for the area around Keadby as the result of geoarchaeological surveys carried out recently in support of the development of Keadby Wind Farm which extends south, west and north of the Proposed Development site. These identified 4 horizons of peat across the site, the lowest of which produced Carbon-14 dates as early as 11,423 - 11,196 cal BC, from the very beginning of the post-glacial period. The Phase 3 peat layer was the most widespread, containing evidence for carr woodland across most the surrounding area in the second half of the third millennium BC (Late Neolithic/Early Bronze Age).

### 10.3.3 Geoarchaeology of the Proposed Development Site

With specific regard to the Proposed Development site, palaeochannels pre-dating the post-medieval drainage schemes have been recognised on aerial photographs immediately to the northeast and south \((Figure 10.3)\). They suggest the presence of a former channel of the Trent running northeast to southwest beneath the footprint of the Keadby I power station.

Similar, although progressively shallower, sequences were encountered by boreholes further to the north and west, appearing to peter out at the southwestern corner of the existing plant (and therefore immediately east of the Proposed Development site). These indicate that the channel was cut through a sequence of fluvial clays, silts and sands lying on top of the mudstone bedrock at a depth of c.13-14 m below the surface. It seems highly probable that the shed deer antlers found during the original coal-fired power station construction in 1951 \((Figure 10.2; site 1)\) came from peat within this channel. This indicates that the site occupies an island of sand in the former marsh. This may at times have been attractive to prehistoric populations as a relatively dry and stable area within the wetland. Any archaeological remains on its surface, however, are likely to have been disturbed by construction and demolition activity over the past 60 years.

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\(^{(1)}\) Flooding sections of land to enrich the soils with transported silt.
Figure 10.2
Known Heritage Assets within Study Area

- Site Boundary
- Study Area
- 22 - South Yorkshire Railway
- 14 - Stainforth and Keadby Canal
- Archaeological Site
- Listed Building (Grade I)
- Listed Building (Grade II)

Note: Site numbers are as referenced in the text and also in the Site Gazetteer, Annex H, Appendix 1

Source: Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Scale: See Scale Bar
Path: P:\Projects\0280278_KeadbyGIS_GB_KM\MAPS\EIA\10_CH\0280278_CulturalHeritage_A02.mxd

Projection: British National Grid
Version: A02
Size: A3
Date: 28/01/2016

Archaeological Site
Listed Building (Grade I)
Listed Building (Grade II)

Site numbers are as referenced in the text and also in the Site Gazetteer, Annex H, Appendix 1.
By contrast, at the former coal storage/rail sidings site on the west side of Chapel Lane beneath made ground, the geotechnical data reveals silty clay, perhaps the result of post medieval marling, above a layer of peat encountered at a depth of c.1.5 m below the surface. This probably represents the Phase 3 late third millennium peat identified during the wind farm surveys, thickening from c.0.3 m on the eastern side to as much as 1.1 m further west. This is broadly in line with the findings of the Keadby Wind Farm auger survey (see Annex H).

10.3.4 Archaeological Baseline

Prehistoric

Any in situ prehistoric archaeological remains in the vicinity of the Proposed Development site would be buried beneath post-medieval warping sediments, as well as later Roman and medieval alluviation. Most evidence for prehistoric activity in the area comes largely from the higher ground around Belton and Crowle to the west of the former marshes, where such material is more visible. The one exception to this is a hoard of socketed axes found in the Trent during the construction of Keadby Bridge, c.1 km southeast of the Proposed Development Site (Figure 10.12, site 4). These are part of a wider pattern of Bronze and Iron Age votive deposition of metal objects in the Trent. They are a reminder that the wetlands would have been attractive to prehistoric human populations, with its rich resources of food and materials (peat, fish, game, plants, wood), as well as likely having spiritual significance.

Roman

A group of surface finds of Roman date in the fields between the existing Keadby I power station and Keadby village points towards third-fourth century AD Roman period activity in this area (Figure 10.12, sites 5-7). This was presumably a riverside settlement, reflecting the importance of river transport at this period. Similar evidence has been recovered further north from fields to the southwest of Amcotts (Figure 10.1, site 8). These were recovered on the west side of a probable palaeochannel, indicating that this settlement may also formerly have been located on the west bank of the Trent. It is possible that the site at Keadby was situated on an island, given the presence of the palaeochannel running across the eastern side of the power station. If this channel was active in the Roman period, the Proposed Development site would have been on the opposite bank from this settlement.

Post-Roman

The origins of the names of both Keadby and Gunness suggest a Viking connection. Keadby is believed to derive from the Old Danish meaning ‘Kaeti’s farmstead’. Similarly Gunness is derived from the Old Norse for ‘Guni’s headland’ (1). One context for such a settlement would be in the eleventh century when the Anglo-Saxon chronicle states that the Danes, in retreat from Lincoln, took shelter in the marshlands of Axholme using the area’s sea and river connections.

(1) Cameron 1998, pp. 54 & 71. Note full literature references for this and the other sources cited in this chapter are provided in the Desk-based Study in Annex H.
Figure 10.3
Approximate Alignments of Historic Drainage Features

- Prehistoric Palaeochannel
- Drainage Pre-1629
- Post-Vermuyden Drainage 1640
- Late 18th Century Drainage
- Nineteenth Century Warping Drains

Site Boundary
Drainage Post-Vermuyden
- Drainage pre-1626
- Early C19 Warping Drains
- Prehistoric
- c 1800

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.
This suggests a continuation of the riverside trading settlements of the Roman period. Any archaeological evidence for settlement at Keadby from this time is located to the east of the power station site, closer to the river frontage.

Medieval

Keadby is not specifically mentioned in the Domesday Survey of 1086AD, when it was probably part of the manor of Althorpe. This was granted by Roger de Mowbray to the Knights Templar after his return from the Crusades. They established a monastic house at Temple Belwood, on the edge of the marshes to the north of Belton, in 1145. In 1182 the order was granted marshland and woodland at Keadby. They also built Nofdyke, one of the first known drainage dykes on the eastern marshes of Axholme running east from Temple Belwood to the Trent, as well as a staithe (wooden riverside quay) between Amcotts and Keadby (1). After the dissolution of the order in 1308, Keadby was annexed to the Abbey of Clerkenwell (2).

When the Axholme marshes were first systematically drained in the early seventeenth century, violent and persistent protests by the local population provides clear evidence that there was a good living to be earned from these areas of apparent ‘waste’. Apart from rich returns from hunting and fishing, the moors provided high quality summer grazing for many thousands of cattle from the manors of Axholme and the surrounding area. It is not surprising, therefore, that the marshes remain largely untouched throughout the medieval period as indicated by Vermuyden’s map of 1626 (Figure 10.4). The only drains/channels in the vicinity of Keadby shown on this are Nofdyke to the south, the ‘Pauper’s Channel’ running west into the marsh just south of Amcotts, and a long drain running south into Nordyke (Figure 10.3). This latter feature appears to have marked the western boundary of the Parish of Althorpe with Keadby, and perhaps is a surviving remnant of an ancient channel of the Trent.

For the settlements on the Lower Trent, the alluvial sediment from the winter floods created rich soils for cultivation in open fields forming a ribbon along the west bank of the river. The pre-enclosure and tithe maps of Keadby show the remains of this pattern, with a riverside band of narrow fields all respecting a single north-south boundary set some 180-200 m back from the bank (Figure 10.4). Behind these fields was a row of enclosures, perhaps dating to the early post-medieval period, backing onto the moorland beyond. The Proposed Development site apparently falls within the medieval moorland stretching westwards of this ribbon of improved land along the riverside.

There are no known medieval buildings or archaeological remains in the immediate area around the project site. The nearest surviving medieval structures are the parish churches (all Grade I Listed Buildings) in Althorpe (2 km away), Belton (6.5 km) and Crowle (5 km) (Figure 10.9). It is clear, nevertheless, that there was a medieval settlement at Keadby and it can be assumed that remains of this lie beneath the current village.

(1) Fleet 2002, 21-22
(2) Read 1858, 380
Figure 10.4
1626 map of the Isle of Axholme before Vermuyden’s drainage

Site Boundary

Figure 10.4
1626 map of the Isle of Axholme before Vermuyden’s drainage
Post-medieval

Following the dissolution of the monasteries, the manor of Keadby was sold into private hands. There is little evidence for further social or economic change on the Isle until Cornelius Vermuyden’s drainage project of the 1620’s. His concept was to redirect the flow of the Rivers Idle and Torn, which bordered the Isle of Axholme to the southwest, and the Don, which ran past Crowle to reach the Trent close to its confluence with the Ouse. These were channelled in large, straight dykes, which are still major features of the landscape, into the Trent just south of Althorpe (Figure 10.3). Large expanses of newly-drained, rectangular arable fields were thereby created in the former river valleys.

At this early stage of large-scale drainage on the Isle of Axholme, as with all subsequent phases of work, the new drains cut across existing dykes. In this case the early north-south drain marking the western boundary of Keadby parish, which joined to Nordyke further south, was severed. Perhaps partly as a response to this, the first major phase of drainage within Keadby was a secondary addition to Vermuyden’s system, the ‘New Idle River’ or ‘Keadby Drain’, running southwest to northeast from a point c.2.3 km west of the Althorpe outfall to a new sluice gate just south of Keadby village.

The earliest OS survey of 1816 (Figure 10.5) shows a number of dykes with meandering courses at Keadby that appear to date to the post-Vermuyden period but apparently pre-date the large-scale changes of the later eighteenth/early nineteenth century. These include one labelled ‘Keadby Old Sewer’ running from the northwest to join a second channel coming from the southwest, which apparently joined together to enter a dyke at the western end of Chapel Lane, near the former White House Farm, and presumably then flowed along a dyke parallel to the lane into the Trent at the Keadby waterfront. There may also have been an element of this same system that ran north-south from the direction of the ‘New Idle River’ to join ‘Keadby Old Sewer’ close to White House Farm. This may be the origin of the north-south extension of Chapel Lane leading to the canal swing-bridge at Keadby Junction.

At this stage, the later seventeenth and first half of the eighteenth centuries, the area of the Proposed Development remained largely moorland. From the middle of the eighteenth century, though, the acceleration of enclosure led to ever more effective programmes of drainage to which were coupled ‘warping’ systems, designed to enable rich fluvial silts from the Trent to be retained on the surface of the new fields. Warping was a process that relied upon the tidal fluctuations of the river, involving the deliberate flooding of areas of former moorland enclosed by temporary banks. The process normally took around three years, after which banks could be removed and ditches backfilled. There were major schemes of enclosure that may have included elements of warping starting as early as the 1760’s in the moors to the north of Keadby. In the 1790’s enclosure acts, which were passed for Amcotts, Owston, Haxey, Epworth and Belton, there was a clause which allowed the drains to be used for warping (1).

(1) Lillie, 1998, 109
Figure 10.5
1816 OS Surveyor’s Map of Keadby

Site Boundary

PROJECTION: British National Grid

DRAWN: GB
CHECKED: CLQ
APPROVED: KM
PROJECT: 0280278

SCALE: See Scale Bar
SIZE: A3
PROJECT: 280278
DATE: 17/12/2015
VERSION: A01
DRAN: GB
CHECKED: O.G
APPROVED: KM

SOURCE: Service Layer Credits: Copyright ©2013 Esri, DeLorme, NAVTEQ
Path: P:\Projects\0280278_KeadbyGIS_GB\KM\MAPS\EIA\10_CH\0280278_1816_A01.mxd
At the same time (it opened in 1802) the Stainforth and Keadby Canal was built, intended to provide a connection between the west and eastern sides of the Isle for cargo boats. From the new waterfront at Keadby, this provided an outlet to the sea and inland waterway network for the agricultural producers of the Isle. A bridge (*Figure 10.2* site 15) was built across the canal at the southern end of Chapel Lane to allowed pedestrians and animals to cross. At the junction with the Trent a swing bridge, replaced in the 1930’s, and tidal lock are now a scheduled monument and Grade II listed building (*Figure 10.2*; site 13).

In constructing the canal, old drainage systems were again intercepted requiring the construction of new drains, the North and South Soak Drains, on either side of the Canal. A second major drain was constructed at approximately the same time running west from the Trent at the northern end of Keadby Village, labelled on the OS survey of 1816 as the Keadby Drain. These two major east-west channels seemingly were the focus of a major phase of warping in Keadby that took place in the 1790’s and 1800’s, with widespread evidence in the form of cropmarks and historic map evidence indicating the lines of secondary channels extending to almost all parts of the moorland within the parish. Recent excavations carried out during the development of the Keadby Wind Farm have revealed the well-preserved remains of a wood-lined warping drain, albeit probably dating to later in the nineteenth century (*Figure 10.2* site 11).

The 1816 enclosure Act for Crowle required the cutting of numerous ditches across the parishes of Amcotts and Keadby (1). The first edition OS surveyor’s draft map of 1816 shows the transformation partly completed, with the power station site still in unenclosed land labelled ‘Keadby Common’ to the west of the village (*Figure 10.5*). This is also the first map to show the layout of the buildings and tracks around the site in any detail. Chapel Lane is depicted on its current alignment, with White House Farm (*Figure 10.2* site 18), and nearby Red House (*Figure 10.2*; site 19), at the point where it turns to the south (both north of the Proposed Development site). A ‘decoy house’ is marked c.350 m to the west of the proposed location for the potential future carbon capture equipment (*Figure 10.2*; site 17). This was presumably a duck decoy house, and could well date back into the seventeenth century. This site continued to be shown as two isolated buildings on OS maps into the early twentieth century, an area that has now reverted to scrubland to the east of sand and gravel quarries. Finally a small group of farm buildings, identified on later maps as Keadby Common Farm, is shown on the west side of Chapel Lane (*Figure 10.2* site 20). The site of this farm, which survived until the 1970’s, lay between the east and western parts of the Proposed Development, where disused distillate fuel holders stand today.

By the time of the Keadby enclosure act of 1836, the area to the west of Chapel Lane had been enclosed, while the area to the east remained open pasture. By the tithe survey of 1850, though, the entire area had been enclosed into regular, rectangular fields (see *Figure 10.6*). The process of enclosure almost certainly included a phase of warping, of which some archaeological traces might survive in less-disturbed parts of the Proposed Development site.

(1) Stonehouse 1839, p.43
Figure 10.6
First Edition Ordnance Survey Map of Project Area

Site Boundary
The final major development to affect the area before the construction of the power station was the South Yorkshire Railway line from Thorne to Keadby which was opened in 1859. This crosses the canal immediately to the south of the project area, and east of the pedestrian bridge, on a swing bridge (Site 15; Figure 10.6). Further to the southeast it crosses the Trent on a much larger swing bridge, a Grade II listed building (Figure 10.2; site 22), on an extension to the line opened in 1916. The construction of the railway, where it passes south of the Proposed Development site, required the moving of the North Soak Drain from beside the canal to the north side of the new embankment.

The arable landscape created by the early nineteenth century drainage schemes remained essentially unchanged in the project area until it was selected as the site for a coal-fired power station in 1947. This opened in 1952 and continued in operation until 1984 (Figure 10.7).

*Figure 10.7 View of Keadby coal-fired power station in operation*

The main turbine and boiler houses for the plant stood on the same site as the existing Keadby I power station, comprising a large concrete building, flanked on the south side with three tall chimneys, a dominant feature of the local landscape. To the west, in the area of the Proposed Development, were single-storey workshop and storage buildings, with an aerial conveyor connecting the main plant with the rail sidings to the west. These fall partly within the west site for the Proposed Development, and are still visible on the ground. The area to the north of the sidings was used for open coal storage.

The Keadby I gas-fired power station was commissioned in 1996 (Figure 10.8). The main buildings were constructed on the same site as the previous coal-fired station, while the switching station was moved to its current site.
the west of Chapel Lane, requiring the demolition of White House Farm and Keadby Common Farm.

**Figure 10.8 View of the Site in the Early 1990's after the Demolition of the Coal-fired Power Station and before the Construction of Keadby I**

10.3.5 Historic Landscape

The Lincolnshire Historic Landscape Characterisation, published in 2011, categorises the lowland landscape around the Isle of Axholme as ‘The Axholme Fens’. It emphasises the open nature of the landscape with long vistas and only occasional settlements, such as Keadby. The many straight drainage ditches and other watercourses are also an important feature.

As described in the historical summary above, the area of Keadby itself has changed more than most other areas of the Axholme fenlands. The open, unenclosed moorlands that were essential to its character until the late eighteenth century have been completely changed as a result of the drainage and warping of that period. In the area of the Proposed Development, the enclosed landscape of regular fields, punctuated by the major channels of the canal and drainage dykes, that replaced the moorland has also been superseded. The development of the coal-fired power station on the site over 60 years ago removed all of these old boundaries, with the exception of Chapel Lane itself. The industrial character of the Proposed Development site is now embedded into its historic landscape.

The Isle of Axholme Area of Special Historic Interest is centred on Epworth, its northern boundary lying c.2km to the south of the proposals site. The existing
Keadby I power station does not significantly impinge on the character of this area.

10.3.6 Setting Baseline

The heritage assets listed in Table 10.2 are those where it has been assessed, on the basis of desk-based studies, ZTV modelling (Figure 10.9 and Figure 10.10 and site visits, that there may be visual impacts from the proposals. The listed buildings in the surrounding area include the Grade I Churches of St Oswald in Crowle and Althorpe, and Grade II listed buildings in Althorpe, Amcotts and Gunness. Due to their distance from the development, combined with the masking effect of surrounding buildings and trees, there will be no effect on the settings of these buildings. Those listed buildings and other heritage assets whose settings will be affected are identified in Table 10.2.
Figure 10.9
Landscape and Built Heritage Features and Zone of Theoretical Visibility Stack Location

Single Shaft Design

Site Location
7.5 km Buffer of the Site
2.5 km Buffer of the Site
Conservation Area
1. Burton Upon Stather
2. Old Crosy
3. New Frodingham
4. Crowle

Scheduled Monument
1. Flixborough Saxon nunnery and site of All Saints medieval church and burial ground
2. Keadby Lock
3. Adlingfleet medieval rectory, 60m south of All Saints Church
4. Axholme Carthusian Priory and post-Dissolution garden earthworks, Melwood Park

Country Parks
1. Normanby Hall

Listed Building within 7.5km of Site (Grade I)
1. Church of All Saints
2. Church of St Oswald
3. Church of St Lawrence
4. Church of St Oswald

Listed Building within 7.5km of Site (Grade II*)
1. Blumby Hall

Listed Building within 2.5km of Site (Grade II)
1. The Old Rectory
2. The Old Hall
3. Grove House
4. Syphon Carrying South Level Engine Drain Under The River Torne
5. Keadby Bridge
6. Stable Block Approximately 10 Metres North East of The Old Rectory
7. The Old Rectory
8. Keadby Lock
9. 94, Old Village Street

Listed Building between 2.5km and 7.5km of Site (Grade II) (94 unreferenced)

Stack Not Visible
Stack Visible
Axholme Area of Special Historic Landscape Interest
Figure 10.10
Landscape and Built Heritage Features and Zone of Theoretical Visibility Cooling Tower

- Site Location
- 7.5 km Buffer of the Site
- 2.5 km Buffer of the Site
- Conservation Area
  1. Burton Upon Stather
  2. Old Crosy
  3. New Frodingham
  4. Crowle

Scheduled Monument
  1. Flixborough Saxon nunnery and site of All Saints medieval church and burial ground
  2. Keadby Lock
  3. Adlingfleet medieval rectory, 80m south of All Saints Church
  4. Axholme Carthusian Priory and post-Dissolution garden earthworks, Melwood Park

Country Parks
  1. Normanby Hall

Listed Building within 7.5km of Site (Grade I)
  1. Church of All Saints
  2. Church of St Oswald
  3. Church of St Lawrence
  4. Church of St Oswin

Listed Building within 2.5km of Site (Grade II)
  1. Brumby Hall
  2. The Old Rectory
  3. Grove House
  4. Syphon Carrying South Level Engine Drain Under The River Torne
  5. Keadby Bridge
  6. Stable Block Approximately 10 Metres North East of The Old Rectory
  7. The Old Rectory
  8. Keadby Lock
  9. 94, Old Village Street

Listed Building between 2.5km and 7.5km of Site (Grade II*) (94 unreferenced)

Axholme Area of Special Historic Landscape Interest

Cooling Tower Not Visible

Cooling Tower Visible
<table>
<thead>
<tr>
<th>Site</th>
<th>Baseline description</th>
<th>Contribution of setting</th>
<th>Asset importance</th>
<th>Overall role of setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keadby Bridge (Listed Building, Grade II)</td>
<td>This steel rail and road bridge was built across the Trent in 1912-16 to carry an eastwards extension of the Great Central Railway onwards from Keadby Lock. It has a rolling lift mechanism. It is built from riveted steel girders. The bridge crosses the river to the south of Gunness c.1.5 km southeast of the Keadby II site. For those crossing the bridge, views towards Keadby power station are clearest on approaches from the east side of the river. When crossing the bridge itself, outward views are substantially obstructed by the structural girders on either side. The landscapes north and south along the Trent are semi-industrial with wharves, warehouses and storage tanks visible in both directions. Keadby power station and its predecessor have been part of this setting for much of the bridge’s existence. The current Keadby I power station is clearly visible to the northwest on eastern approaches to the bridge without standing out as a dominant feature on the skyline.</td>
<td>Moderate</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Keadby Lock (Scheduled Monument)</td>
<td>This tidal canal lock is located at the eastern terminus of the Stainforth and Keadby Canal, where it enters the River Trent, c.1.5 km southeast of the Keadby II site. When first constructed at the end of the eighteenth century, the lock was crossed by a swing bridge, the stone abutments of which are still visible. New gates and the current road swing bridge were constructed in the 1930’s. Its setting today is the semi-industrial landscape of the Trent. The most important aspect of this setting is the canal and river. The Keadby I power station stands c.600 m to the west on the north side of the Canal (clearly visible from the Lock; see LVIA Viewpoint 2). It, and its predecessor, have formed part of the industrial setting of the Lock for over 60 years.</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Chapel Lane swing bridge (non-designated)</td>
<td>This swing bridge across the Stainforth and Keadby Canal presumably dates to its construction (1793-1802). The cottage adjacent to it may well have been built at the same time for a bridge-keeper. The bridge crosses the Canal immediately to the south of the Proposed Development. Its setting has already been very substantially modified by the presence of the existing power station and associated overhead lines/pylons. However its key setting, the Canal, remains largely unchanged.</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Rectory Lodge, Gunness (Listed Building, Grade II)</td>
<td>1860’s Gothic revival rectory at the southern end of Gunness. It faces towards the river across the sewage farm and other light industrial buildings on the east side of the river, which have significantly degraded its original riverside setting. The Keadby I power station is visible behind warehouse structures c.1.5 km to the west.</td>
<td>Moderate</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>
10.4 **ASSESSMENT OF EFFECTS**

10.4.1 **Introduction**

The purposes of the following two sections are to identify likely significant effects with Section 10.5 outlining proposed mitigation. It is worth noting that the cultural heritage specialists have worked closely with the landscape and visual impacts specialists in completing the assessment.

10.4.2 **Assessment of Effects during Construction**

On the basis of the extensive disturbance known to have taken place to the east of Chapel Lane during the construction and demolition of the 1952 coal-fired power station and the existing 1990’s Keadby I power station, it is considered unlikely that there could be surviving buried remains of archaeological significance in this area.

By contrast it is possible that buried remains could survive on that part of the site to the west of Chapel Lane. The significance of effects on such remains would depend on their presence/archaeological significance.

The effect of the proposed water discharge pipeline will depend on whether it is decided to use the existing pipeline or install a new one. In the latter case, there would be an archaeological watching brief undertaken during construction.

10.4.3 **Assessment of Effects during Operation**

Potential operational effects on cultural heritage are mainly made up of changes in the setting of surrounding heritage assets and the historic landscape. A key consideration in assessing the significance of such effects is the fact that there has been a power station at Keadby since the early 1950s. The original coal-fired power station was much larger than the current gas-fired facility, with three high chimneys forming major local landmarks on the western side of the turbine hall (*Figure 10.7*). The current power station is therefore an important landmark within the historic landscape, which forms part of the setting of the buildings assessed below. The addition of Keadby II alongside the existing facility would not, therefore, mark a significant change in historic character of the area.

The development of the nearby Keadby wind farm has also had an effect on the wider historic landscape of the east Axholme lowlands, particularly in combination with the numerous electricity pylons carrying power from the Keadby I power station. These tall industrial structures form part of the context of the historic landscape of the area, including the Isle of Axholme Area of Special Historic Interest.

Taking the above into account, the significance of effects on heritage assets because of the change in setting caused by the Proposed Development are assessed below. As discussed in *Chapter 2*, two technology options have been considered for the Proposed Development: a single-shaft and a multi-shaft layout. Both layout options have been assessed within *Chapter 13* (Landscape and Visual) in terms of their effects on setting within the area, and
that assessment informs this section. The assessment of potential impacts on archaeological significance that follows applies to both single and multi-shaft options;

- The magnitude of change in the setting of Keadby Bridge, given the distance and the presence of the existing Keadby I power station, will be small and the overall level of effect on the role of setting in the asset’s significance will be minor adverse. The effect on the asset will be not significant.

- The magnitude of change in the setting of Keadby Lock, given the effect of the existing Keadby I power station in front of the Proposed Development site (see Figure 13.7, photomontages from Viewpoint 2), will be small and the overall level of effect on the role of setting in the asset’s significance will therefore be minor adverse. The effect on the asset will be not significant.

- The magnitude of change in the setting of Chapel Lane canal swing bridge (a non-designated asset; see Figure 13.7, photomontages from Viewpoint 4), given its proximity to the existing Keadby I power station, will be medium and the overall level of effect on the role of setting in the asset’s significance will therefore be minor adverse. The effect on the asset will be not significant.

- The magnitude of change in the setting of Rectory Lodge, Gunness, will be negligible leading to a negligible effect on the role of setting in the asset’s significance. The effect on the asset will therefore be not significant.

The Proposed Development will also have no significant effect on the Isle of Axholme Area of Special Historic Interest given that it lies at least 2 km to the south of the power station, on the other side of the Stainforth and Keadby Canal, Torne River and A18 highway.

10.4.4 Assessment of Effects during Decommissioning

There will be no identifiable effects on cultural heritage during decommissioning.

10.4.5 Cumulative Effects

Other projects which have been considered in terms of cumulative effects are the Lincolnshire Lakes residential development, construction and re-alignment of overhead lines within the Proposed Development site and the White Rose CCS scheme. It is concluded that there are no cumulative effects on cultural heritage from these schemes on the same receptors as assessed in this EIA.

10.4.6 Uncertainty and Key Assumptions

A final assessment of archaeological potential on the western side of the site (to the west of Chapel Lane) will require pre-construction archaeological fieldwork targeted on the proposed development footprint.
10.5 **Mitigation**

10.5.1 **Construction**

There is potential for the new development to have impacts on buried remains of archaeological and/or paleoenvironmental significance, in particular in the area to the west of Chapel Lane that has experienced less disturbance. Construction activity in this area will be preceded by archaeological fieldwork that could take the form of a palaeoenvironmental coring survey and/or trial trenching.

Should intrusive construction works for a new cooling water pipeline to the Trent be required, there would be a watching brief during its construction.

All archaeological fieldwork will be undertaken in accordance with the standards and guidance of the Chartered Institute for Archaeology.

10.5.2 **Operation**

The minor effects on the setting of a small number of surrounding heritage assets do not require mitigation.

10.5.3 ** Decommissioning**

No mitigation will be required during decommissioning.

10.6 **Conclusions**

A baseline study has concluded that there are unlikely to be archaeologically significant buried remains on the eastern part of the Proposed Development site. While there is potential for remains to survive on the western side of the site, there is no evidence for this other than peat deposits of possible palaeoenvironmental interest. There are relatively few designated heritage assets in the area and none of these will experience anything more than minor effects on the role of setting in an asset’s significance and therefore effects will be not significant.

Mitigation actions will comprise i) evaluation fieldwork to be undertaken in advance of construction activity on the western side of the site (the locations of cooling units and interconnecting pipelines) and ii) a watching brief should a new water cooling pipeline to the Trent be constructed.

The residual effects of the Proposed Development will be not significant or, at most, minor.

10.7 **Comparison between the Likely Significant Effects of the Consented Development and Proposed Development**

This ES is required to present the main respects in which it is considered that the likely significant effects on the environment of the Proposed Development would differ from those described in the Environmental Assessment (EA) that
was prepared for the Consented Development. The table below makes a comparison between the findings of this EIA for the Proposed Development and those of the 1992 EA to the extent possible.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Comparison</th>
</tr>
</thead>
</table>
| Direct Effects on Archaeology and Cultural Heritage | • The EA for the Consented Development stated that there would be no features of archaeological value affected and it can be assumed this led to a conclusion of no likely significant effects.  
  • This EIA for the Proposed Development concludes that although there is potential in the western part of the site for impacts on buried remains of archaeological and/or paleoenvironmental significance, with mitigation in place the effects will be not significant. | O |
| Effects on setting of Heritage Assets      | • Although they were not specifically assessed at the time the effects on setting of cultural heritage effects will be very similar to those for both the Consented Development and Proposed Development. |   |

Key:  [ ] = positive change; [ ] = neutral; [ ] = negative change