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# SPALDING ENERGY EXPANSION

## NON-TECHNICAL SUMMARY OF THE ENVIRONMENTAL STATEMENT FURTHER INFORMATION DOCUMENT

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| ACC | Air Cooled Condenser |
| AGI | Above Ground Installation |
| AOD | Above Ordnance Datum |
| BSSSC | British Sugar Sports and Social Club |
| CCGT | Combined Cycle Gas Turbine |
| CCR | Carbon Capture Readiness |
| CEMP | Construction Environmental Management Plan |
| CHP | Combined Heat and Power |
| CTMP | Construction Transport Management Plan |
| DECC | Department of Energy and Climate Change |
| EIA | Environmental Impact Assessment |
| ERP | Emergency Response Plan |
| ES | Environmental Statement |
| ES FID | Environmental Statement Further Information Document |
| HRSG | Heat Recovery Steam Generator |
| IED | Industrial Emissions Directive |
| LHV | Lower Heating Value |
| LNR | Local Nature Reserve |
| MW | megawatts |
| OCGT | Open Cycle Gas Turbine |
| SAC | Special Area of Conservation |
| SEE | Spalding Energy Expansion |
| SEEL | Spalding Energy Expansion Limited |
| SNCI | Site of Nature Conservation Importance |
| SPA | Special Protection Area |
| SSSI | Site of Special Scientific Interest |
| SUDS | Sustainable Urban Drainage System |

# 1 INTRODUCTION

## 1.1 Overview

1.1.1 In March 2009, Spalding Energy Expansion Limited (SEEL) submitted an application for Consent under Section 36 of the Electricity Act 1989 (the Original Consent Application) to the Secretary of State for Energy and Climate Change (the Secretary of State) via the Department of Energy and Climate Change (DECC) to construct a 900 megawatt (MW) Combined Cycle Gas Turbine (CCGT) generating station to be known as Spalding Energy Expansion (SEE). In addition, a direction that planning permission be deemed to be granted under Section 90 of the Town and Country Planning Act 1990 was also sought.

1.1.2 In terms of environmental documentation / studies, the Original Consent Application was accompanied by an Environmental Statement (the March 2009 ES).

1.1.3 In July 2009, additional information on flood risk was provided to the Environment Agency.

1.1.4 On 11 November 2010, the Original Consent was granted for SEE.

## 1.2 Purpose of this Document

1.2.1 SEEL is submitting an application to the Secretary of State for the Original Consent to be varied (the Variation Application). If the Original Consent is varied as per the Variation Application, SEE will provide up to 945 MW of power generation capacity. In providing up to 945 MW of power generation capacity, the Proposed Development will either comprise:

- Scenario 1: Up to 945 MW of CCGT units; or
- Scenario 2: Up to 645 MW of CCGT units and less than 300 MW of Open Cycle Gas Turbine (OCGT) units.

1.2.2 In addition, if the Original Consent is varied as per the Variation Application, the commencement deadline for the Consent will be 5 years from the date of granting the variation. Similarly, the commencement deadline for the deemed planning permission will be 5 years from the date of granting the variation.

1.2.3 To accompany the Variation Application, SEEL is providing the following information to DECC:

- A Variation Application Environmental Statement Further Information Document (ES FID), which includes (amongst other items):
  - The rationale for proposing that the Original Consent is varied;
  - Updated environmental baseline information;
  - An assessment of whether the likely significant effects on the environment of the Proposed Development[1] differ from those described in the March 2009 ES; and,
    - Where there is potential for the likely significant effects to differ, an updated impact assessment.
    - Where there is no potential for the likely significant effects to differ, an explanation and / or supporting information.
- A Revised Carbon Capture Readiness (CCR) Feasibility Study;
- A Revised Combined Heat and Power (CHP) Assessment; and,
- A Supplementary Flood Risk Assessment.

[1] Being the generating station which SEEL would be authorised to construct under the Original Consent if this is varied as requested in the Variation Application.

1.2.4 Used in combination, the information in the March 2009 ES and the Variation Application ES FID provide the results of a comprehensive and independent assessment of the likely significant effects on the environment, as described in Schedule 4 of the Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000 (the Environmental Impact Assessment (EIA) Regulations) as modified by the Electricity Generating Stations (Variation of Consents) (England and Wales) Regulations 2013 (the Variation Regulations), of the Proposed Development.

1.2.5 This document is a Non-Technical Summary of the Variation Application ES FID.

# 2 THE PROPOSED DEVELOPMENT

## 2.1 Introduction

2.1.1 The following Section provides an overview of the Proposed Development for both Scenario 1 and Scenario 2.

2.1.2 The Original Consent currently allows for the development of a CCGT generating station with a generation capacity of about 900 MW with a tolerance of up to 5 per cent. This would give a total permitted generation capacity of up to 945 MW.

2.1.3 Accordingly, if the Original Consent is varied as per the Variation Application, SEE will provide up to 945 MW of power generation capacity. SEE will be capable of operating continuously for up to 35 years.

2.1.4 In providing up to 945 MW of power generation capacity, the Proposed Development will either comprise:

- Scenario 1: Up to 945 MW of CCGT units; or,
- Scenario 2: Up to 645 MW of CCGT units and less than 300 MW of OCGT units.

2.1.5 In addition, if the Original Consent is varied as per the Variation Application, the commencement deadline for the Consent will be 5 years from the date of granting the variation Similarly, the commencement deadline for the deemed planning permission will be 5 years from the date of granting the variation.

***Process Description***

CCGT Unit(s)

2.1.6 Under Scenario 1, there will be two CCGT units with a total rated electrical output of up to 945 MW. Under Scenario 2, there will be one CCGT unit with a rated electrical output of up to 645 MW.

2.1.7 Each CCGT unit will include a gas turbine, a HRSG, a steam turbine and associated equipment. The natural gas will be burnt in the combustion chamber of the gas turbine from which hot gases will expand through the turbine section to generate electricity. The hot exhaust gases still contain recoverable energy and will therefore be used in a HRSG to generate steam, which in turn is used to generate electricity via steam turbine equipment.

2.1.8 The steam exhausting the steam turbine equipment will pass to an Air Cooled Condenser (ACC) where it will be condensed. The resultant condensate will be returned to the HRSGs to continue the steam cycle. The use of ACCs has the potential to reduce environmental impacts associated with other cooling systems, and is considered to have the following benefits:

- No visible cooling tower plumes;
- Significantly lower water consumption; and
- No surface water abstraction or discharge of heated cooling water to watercourses.

2.1.9 The flue gases will be discharged via a dedicated stack.

2.1.10 The use of a combined gas and steam cycle increases the overall fuel efficiency of the generating station. As such, the CCGT unit(s) will be capable of generation in combined cycle mode with an overall electrical generation efficiency between approximately 55 to 60 per cent based on the Lower Heating Value (LHV) of the fuel.

OCGT Units

2.1.11 Under Scenario 2, the OCGT unit(s) will have a total rated electrical output of less than 300 MW.

2.1.12 In essence, an OCGT unit comprises the prime driver of a CCGT unit, which is the gas turbine. As with a CCGT unit, the natural gas will be burnt in the combustion chamber of the gas turbine from where the hot gases will expand through the gas turbine to generate electricity.

2.1.13 As there is no steam cycle, there is no condensing of steam which has an associated cooling requirement. Furthermore, whilst auxiliary cooling is still required, this requirement is significantly lower than for that for a CCGT unit.

2.1.14 The hot exhaust gases are routed directly to a dedicated stack. The stack normally contains a silencer to reduce noise emissions. Due to the higher stack exit temperature, the stacks of OCGT units are generally shorter than those of CCGT units.

2.1.15 The OCGT units will have an electrical generation efficiency between approximately 33 to 43 per cent based on the LHV of the fuel.

Comparison of CCGT and OCGT Units

2.1.16 A high-level comparison of a number of the key differences between CCGT and OCGT units is provided in Table 2.1.

**TABLE 2.1: COMPARISON BETWEEN CCGT AND OCGT UNITS**

| ***Parameter*** | ***CCGT*** | ***OCGT*** |
|---|---|---|
| Efficiency | Between approximately 55 to 60 per cent | Between approximately 33 to 43 per cent |
| Start Up Time | Between 30 to 180 minutes | Between 20 to 30 minutes |
| Cooling | Required for steam condensing and auxiliaries (larger requirement) | Required for auxiliaries only (smaller requirement) |
| Stack Height | Typically larger, on the proposed SEE will be up to 85 m | Typically smaller, between 30 to 35 m |

***Layouts / Dimensions***

2.1.17 The Proposed Development will be located wholly within the SEE site (see FIGURE 63114-PBP-120-1-3 associated with the Original Consent).

2.1.18 Within the March 2009 ES it was stated (at paragraphs 4.6 to 4.8) that: *"the final detailed design of the proposed SEE will not be completed until a Construction Contractor(s) is in place and, therefore the final configuration of the plant cannot be confirmed until then. Thus, a degree of flexibility, within the confines of the parameter plan, with regard to the positioning and scale of the components* […]*, is required to allow for minor changes to the layout as the project progresses. As such, a 'Parameter Block Model Layout' has been developed to establish the maximum extent of the physical development of the proposed SEE*.

*The 'Parameter Block Model Layout' consists of a block model of the proposed SEE, demonstrating the maximum deviations that may occur within a series of three dimensional envelopes.* [The 'Parameter Block Model Layout'] *comprises five distinct envelopes of varying heights based on the maximum heights of structures or buildings that may occur within each area of the proposed SEE site.* […]

[…] *The EIA is based on the parameter plan to ensure that the environmental effects of the possible layout variants and plant types have been considered. This approach allows for assessment of the 'worst-case scenario' in terms of the potential impacts. Through the detailed design process the proposals for the proposed SEE will be refined and it is likely that the eventual effects will be lower than those predicted, particularly with regard to the Landscape and Visual* [Impact] *Assessment".*

2.1.19 The Parameter Block Model Layout is shown in Insert 2.1. Whilst there may be some re-location of items of plant / equipment, under both Scenario 1 and Scenario 2, the Proposed Development will be located wholly within the limits of the Parameter Block

Model. As noted previously, the Construction Contractor who will complete the final design of SEE (including final layout) will not be appointed until after the Section 36 Consent has been varied. At this time the final design / layout of SEE will be agreed with South Holland District Council prior to the commencement of construction. The requirement to agree the final design of SEE is provided by Condition 5(7) of the Original Consent.

2.1.20 Table 2.2 identifies the main plant / equipment expected to be located within the various areas of the parameter block model.

A Note on Site Levels[2]

2.1.21 Site levels have been carefully developed to mitigate flood risk and ensure accessibility standards are met. Under both Scenario 1 and Scenario 2, the design flood level for the Proposed Development (taking account of climate change and freeboard) is 6.5 m AOD.

2.1.22 The whole site will be regarded to this level, except where the Proposed Development must tie in with the adjacent land along the boundary of the proposed SEE site. In particular, the substation will be raised to approximately 5.3 m AOD to facilitate interconnection with the existing Spalding CCGT generating station substation which is approximately 4.8 m AOD. However, it should be noted that the substation has been modelled at 6.5 m AOD in the parameter block model layout to allow for a worst case scenario in terms of landscape and visual impacts.

[2] Further information is provided in the Supplementary Flood Risk Assessment.

## INSERT 2.1: PARAMETER BLOCK MODEL LAYOUT




Limits of deviation for the above ground elements of the proposed SEE have been modelled using several coloured 'parameter blocks' related to the function and potential height of each part of the plant. The blocks are modelled at the maximum height of the structures or buildings that may occur within each area. Areas with taller stacks have been modelled as cylinders rising out of the development blocks in order to illustrate the proposed position and maximum dimensions of the stacks. Overall, this has allowed for a worst case scenario in terms of the impact, and has been used as the basis for the visual modelling. Colours are used to illustrate the different development envelopes and are not indicative of the colour of the structures / buildings. The actual colours of the proposed structures / buildings will be agreed with South Holland District Council to help minimise the visual impact of SEE.

**TABLE 2.2: MAIN PLANT / EQUIPMENT EXPECTED TO BE LOCATED WITHIN THE PARAMETER BLOCK MODEL**

| ***Block*** | ***Main Elements*** | ***Changes from the March 2009 ES*** | ***Maximum Height (m)*** | ***Area ($m^2$)*** |
|---|---|---|---|---|
| Blue | For Scenario 1:<br>• Substation; and,<br>• Gas Receiving Facility.<br>For Scenario 2:<br>• Substation. | This area previously contained a pylon. However, as no new overhead line will be required for the export of electricity from the Proposed Development, no new pylon will be required. | 14<br>(with parameter allowance for pylon structure of 65 m) | 27,000 |
| Green | For Scenario 1:<br>• Water Treatment Plant and Water Storage Tanks.<br>For Scenario 2:<br>• Gas Receiving Facility. | Changes to the elements contained within. | 23 | 5,000 |
| Purple | For Scenario 1:<br>• Warehouse / Maintenance / Admin / Control Building.<br>• Landscaping<br>For Scenario 2:<br>• Water Treatment Plant and Water Storage Tanks; and,<br>• Landscaping. | Changes to the elements contained within. | 17 | 8,750 |
| Yellow | ***Main Plant / Equipment***<br>For Scenario 1:<br>• 2 CCGT units and associated equipment; and,<br>• Car parking.<br>For Scenario 2:<br>• 1 CCGT unit and associated equipment;<br>• OCGT unit(s), stack(s) of the OCGT unit(s) and associated equipment;<br>• Warehouse / Maintenance / Admin / Control Building; and,<br>• Car parking. | This area was previously the main plant / equipment area. | 39.5 | 36,400 |
| Blue Hatch | Main Stack(s) for CCGT unit(s) | This area was previously the zone of deviation for the main stack(s) of the CCGT unit(s). | 82<br>(the hatching shows the zone of deviation) | 5,250 |

2.1.23 Similar to the March 2009 ES, the main plant / equipment is expected to be located in the central part of the proposed SEE site.

2.1.24 For Scenario 1, Table 2.3 presents the expected main plant / equipment dimensions. The requirement to adhere to these main plant / equipment dimensions is provided by Condition 5(9) of the Original Consent.

**TABLE 2.3: SCENARIO 1 – EXPECTED MAIN PLANT / EQUIPMENT DIMENSIONS**

| ***Plant / Equipment*** | ***Height (m)*** | ***Area ($m^2$)*** |
|---|---|---|
| CCGT Unit | | |
| Turbine Hall Area (Gas Turbines and Steam Turbine(s)) | 37 | 5,400 |
| HRSGs | 40 | 1,600 (800 per HRSG) |
| Stacks | 85 | 12 m diameter |
| ACC | 36 | 6,400 |
| Other Plant / Equipment | | |
| Warehouse / Maintenance / Admin / Control Building | 20 | 3,100 |
| Water Tanks | 21 | 24 m diameter |
| Substation | 12 | 23,000 |

2.1.25 For Scenario 2, Table 2.4 presents the expected main plant / equipment dimensions.

**TABLE 2.4: SCENARIO 2 – EXPECTED MAIN PLANT / EQUIPMENT DIMENSIONS**

| ***Plant / Equipment*** | ***Height (m)*** | ***Area ($m^2$)*** |
|---|---|---|
| CCGT Unit | | |
| Turbine Hall Area (Gas Turbine and Steam Turbine) | 37 | 3,700 |
| HRSG | 39.3 | 940 |
| Stack | 85 | 12 m diameter |
| ACC | 32 | 4,600 |
| OCGT Unit(s) | | |
| Gas Turbine Area | 6 | 600 |
| Stack(s) | 39.5[3] | Up to 8.5 m diameter |
| Other Plant / Equipment | | |
| Warehouse / Maintenance / Admin / Control Building | 20 | 3,100 |
| Water Tanks | 21 | 24 m diameter |
| Substation | 12 | 22,500 |

2.1.26 The design of equipment / buildings / enclosures will also minimise regular and long-term maintenance requirements. Materials and finishes will be selected to meet this objective and to ensure that the appearance of the Proposed Development does not deteriorate materially over its operating lifetime (approximately 35 years). Materials and finishes will be similar to those used on existing CCGT power plants, and will be selected to be sympathetic the appearance of the surrounding land uses. The requirement to agree the final design of SEE is provided by Condition 5(7) of the Original Consent.

[3] Whilst the stack(s) for the OCGT unit(s) are noted to be up to a maximum height of 39.5 m, see Section 8 (Air Quality) which notes that the most likely stack height will be 30 m.

### *Landscaping*

2.1.27 A landscaping strategy has been developed which aims to enhance the ecological resource of the proposed SEE site, and maintain connectivity to ecological resources in the wider area.

2.1.28 Under the landscaping strategy:

- The landscaping proposals will incorporate native species and include the following (or similar):
  - Planting of hedgerow and hedgerow trees along the boundary with West Marsh Road to provide screening of the perimeter security fence and low level elements of the Proposed Development. Poplar species may be suitable as they are fast growing, provide excellent screening and are in keeping with the surrounding landscape (poplars are present immediately across Vernatt's Drain);
  - Planting of woodland, trees and shrubs to create screening and enhance Vernatt's Drain habitat corridor. Native oak species would be appropriate;
  - Shrub planting in various locations around the proposed SEE site (e.g. car parking areas), incorporating berried species to encourage birds into the site. Native berry-bearing species could include: rowan; holly; whitebeam; spindle; dog rose; guelder rose; elder; hawthorn; honeysuckle; or, ivy. Non-native berry-bearing species could include: cotoneaster; pyracantha; and, berberis; and,
  - Mixed species grassland in the land to the south east which is to be set aside for the purposes of CCR.
- The Proposed Development will include a new SUDS water feature(s). This feature(s) will be planted with a fringe of emergent and marginal vegetation such as: common reed; rushes; reed sweet grass; marsh marigold; yellow iris; water mint; and, other wetland species. The new feature(s) will provide similar wildlife habitat to that used by birds and invertebrates along Vernatt's Drain and the River Welland, as well as treating and detaining water on the site as required.
- It is noted that all planting is proposed at a distance of greater than 9 m from Vernatt's Drain, as required by the Welland and Deepings Internal Drainage Board.

2.1.29 The requirement to agree and implement the landscaping strategy is provided by Condition 5(39), Condition 5(40) and Condition 5(41) of the Original Consent.

## 2.2 The Proposed SEE Site and its Surroundings

### *Site History*

2.2.1 Historical Ordnance Survey (OS) Maps of the area indicate that both the existing Spalding CCGT generating station site and the proposed SEE site were undeveloped and used as agricultural farm land until the establishment of the sugar factory (owned by British Sugar PLC) in 1926.

2.2.2 Indeed, the 1888 / 1889 Edition OS Map shows that a network of drains covered both the existing Spalding CCGT generating station site and the proposed SEE site. The 1932 Edition OS Map shows the 'Anglo-Scottish Sugar Beet Factory' and associated infrastructure (including rail lines) in the centre of the existing Spalding CCGT generating station site, north of the proposed SEE site. The sugar beet process utilised significant volumes of water to rinse soil from the beet crop during processing. This water was discharged to settlement lagoons where water was lost through natural processes (i.e. evaporation and, possibly, percolation). The settlement lagoons were initially created by the movement of naturally occurring soils into embankments which were then heightened by the continuous deposition of settled soils over a number of years. These settlement lagoons were shown to be located over the majority of the proposed SEE site. At the time of closure of the 'Anglo-Scottish Sugar Beet Factory', the area covered by the

settlement lagoons was higher than the surrounding area by between 4 and 5 metres. In addition, also a sewage works and rail lines were shown to be present on the northern part and western boundary of the proposed SEE site respectively.

2.2.3 Indeed, the 1951 Edition OS Map shows that the settlement lagoons had expanded and occupied approximately 40 per cent of the proposed SEE site, and the drainage network in the southern half of the site was no longer shown.

2.2.4 The 1968 Edition OS Map shows that the 'Anglo-Scottish Sugar Beet Factory' comprised eleven circular structures resembling tanks, with two further tanks (which appear to be waste water treatment tanks) to the south. Sludge beds associated with the sewage works were also shown, and a playing field is shown to be located to the north east of the existing Spalding CCGT generating station site.

2.2.5 By 1988, the sludge beds associated with the sewage works had been replaced by settling ponds. Furthermore, two electrical sub-stations were shown to be present adjacent to the 'Anglo-Scottish Sugar Beet Factory'. The rail lines were no longer depicted.

2.2.6 The 'Anglo-Scottish Sugar Beet Factory' closed in 1994, and was demolished in 1996. Indeed, the 2000 Edition OS Map shows that the 'Anglo-Scottish Sugar Beet Factory', tanks, settlement lagoons, sewage works and settling ponds were no longer present.

2.2.7 The existing Spalding CCGT generating station was constructed between 2001 and 2004 and became operational on 1 October 2004. The electrical and gas supply infrastructure connections were established in November 2003 and January 2004 respectively. The existing Spalding CCGT generating stations produces up to 880 MW of electricity for export to the National Grid.

### *The Existing Spalding CCGT Generating Station Site*

2.2.8 The proposed SEE is an expansion of the existing Spalding CCGT generating station, and it is intended that there will be a number of shared elements. Therefore, a description of the existing Spalding CCGT generating station, and its associated site, is required in order to understand the proposals for SEE.

2.2.9 The existing Spalding CCGT generating station site comprises a developed area which is accessed from the north via security controlled 'Site Entrance A' on West Marsh Road. There are two further secure accesses ('Site Entrance B' and 'Site Entrance C') which are accessed via West Marsh Road on the eastern side of the facility. As with the proposed SEE site, the existing Spalding CCGT generating station site is bounded to the east by West Marsh Road and to the west by Vernatt's Drain.

2.2.10 The majority of the existing Spalding CCGT generating station site is hard-standing, although gravelled areas are utilised in external areas around buildings and operational plant / equipment. There is a single surface water pond located in the northern corner of the existing Spalding CCGT generating station site, adjacent to the car park and security gatehouse.

2.2.11 The main buildings and plant / equipment are laid out from north to south as follows:

- The ACC is located just beyond the entrance to the existing Spalding CCGT generating station site, with an administration office, workshop and warehouse situated to the west;
- The two HRSGs and associated stacks (78 m high) are located to the south of the warehouse, across an internal road;
- The turbine hall is located adjacent to the south of the HRSGs, and houses two gas turbines and one steam turbine;
- The control room is attached to the turbine hall; and,
- The three main transformers are located to the south of the turbine hall.

2.2.12 In addition, the existing National Grid Spalding 400 kV substation is located at the southern extent of the existing Spalding CCGT generating station site. The proposed SEE site is located immediately to the south of this existing National Grid Spalding 400 kV substation on brownfield land.

### *The Proposed SEE Site*

2.2.13 The proposed SEE site lies approximately 2 km to the north east of Spalding town centre. The Ordnance Survey (OS) Grid Reference of the centre of the SEE site is approximately 525950, 324950.

2.2.14 The proposed SEE site is bounded by West Marsh Road to the east and by Vernatt's Drain to the west. The River Welland lies approximately 30 m to the east.

2.2.15 The proposed SEE site occupies a total area of approximately 14 ha, within which approximately 4.3 ha of land in the south of the proposed SEE site has been set aside by SEEL for the purposes of CCR.

2.2.16 The northern boundary of the proposed SEE site comprises made ground in the form of a large flat-topped mound (the Mound) up to 4 m above ground level. The Mound is formed from washings from the former sugar beet settlement lagoons that were relocated from the site of the existing Spalding CCGT generating station site at the time of its construction.

2.2.17 Other than the Mound, the proposed SEE site is predominately open and grassy in nature, with the exception of a group of buildings (formerly used by the British Sugar Sports and Social Club (BSSSC)), a disused administration building located in the north east corner of the site and four storage tents located in the north west corner of the site. It will be necessary to demolish these facilities as part of the development of the proposed SEE.

### *The Proposed SEE Site Surroundings*

2.2.18 The immediately surrounding land use is predominantly industrial, with some residential properties located further afield. In brief, the surrounding land uses comprise:

- To the north, the existing National Grid Spalding 400 kV substation and the existing Spalding CCGT generating station site, beyond which is a sewage treatment works operated by Anglian Water.
- To the north east, across West Marsh Road, the Gas Receiving Facility for the existing Spalding CCGT generating station, and some local authority offices.
- To the east, West Marsh Road and the River Welland which has associated flood defences. Further to the east, across the River Welland, is agricultural land with occasional housing.
- To the south east, Springfields Shopping Centre and the Festival Gardens.
- To the south, undeveloped industrial land, with industrial buildings located beyond comprising a mixture of commercial buildings and vehicle parking.
- To the west, Vernatt's Drain which is a man-made drainage channel designed as a flood prevention measure (Vernatt's Drain also has associated flood defences). A public footpath runs along the eastern side of Vernatt's Drain, adjacent to the proposed SEE site. Further to the west, vacant grassland and the Benner Road Industrial Estate comprising a mixture of industrial premises, including some associated with food storage, processing and distribution.
- To the north west, over Wardentree Lane, a factory, various warehouses and business space.

2.2.19 The wider area is predominantly rural. Indeed, agriculture, horticulture and food processing industries represent the main land uses in the wider area.

2.2.20 There are two statutory designated sites of ecological interest within a 5 km radius of the proposed SEE site. These are:

- Vernatt's Local Nature Reserve (LNR) located approximately 700 m to the south west; and,
- Surfleet Lows Site of Special Scientific Interest (SSSI) located approximately 3.5 km to the north.

2.2.21 There are also three non-statutory designated sites of ecological interest within a 2 km radius of the proposed SEE site. These are:

- Spalding Cemetery Site of Nature Conservation Importance (SNCI) located approximately 600 m to the south west;
- Vernatt's SNCI located approximately 700 m to the south west (similar to Vernatt's LNR above); and,
- Pinchbeck Marsh SNCI located approximately 1 km to the north.

2.2.22 Further afield, designated sites include:

- Cowbit Wash (Geological) SSSI located approximately 5 km to the south;
- Baston Fen Special Area of Conservation (SAC) / SSSI located approximately 15 km to the south west;
- Cross Drain SSSI also located approximately 15 km to the south west; and,
- The Wash and North Norfolk SAC / The Wash Special Protection Area (SPA) and Ramsar Site located approximately 15 km to the east (collectively termed The Wash).

# 3 RELATIONSHIP BETWEEN THE MARCH 2009 ES AND THE VARIATION APPLICATION ES FID

## 3.1 Overview

3.1.1 Table 3.1 identifies the information provided in the Variation Application ES FID and its relationship with the information provided in the March 2009 ES.

**TABLE 3.1: RELATIONSHIP BETWEEN THE MARCH 2009 ES AND THE VARIATION APPLICATION ES FID**

| *This Variation Application ES FID* | *The March 2009 ES* | *Comments* |
|---|---|---|
| Section 1 – Introduction | Supplements Section 1 (Introduction) of the March 2009 ES. | This Section provides a consenting history of SEE, and the underground gas pipeline and associated Above Ground Installation (AGI). The relevant environmental information is also described. |
| Section 2 – Rationale for Development | No corresponding Section. | This Section has been provided to note current national policy on the need for new energy infrastructure included in the National Policy Statements approved by Parliament in July 2011. |
| Section 3 – Policy Context | No corresponding Section. | This Section has been provided to note the changes in energy and planning policy between March 2009 and the Variation Application. |
| Section 4 – EIA Methodology and ES Content | Supplements Section 2 (EIA Process and Methodology) of the March 2009 ES. | This Section has been updated to provide details on the EIA methodology and ES content for this Variation Application ES FID based on the requirements of the Electricity Works (Environmental Impact Assessment) Regulations 2000 (the EIA Regulations) as modified by the Electricity Generating Stations (Variation of Consents) (England and Wales) Regulations 2013 (the Variation Regulations). |
| Section 5 – Stakeholder Consultation | Supplements Section 2 (EIA Process and Methodology) of the March 2009 ES. | This Section has been provided to note the stakeholder consultation which has been undertaken for the Variation Application. |
| Section 6 – Proposed Development and Alternatives | Supplements Section 4 (Development Description) of the March 2009 ES. | This Section has been updated to provide details on the Proposed Development, and the two proposed Scenarios to be included in the Variation Application.<br>This Section also provides a summary description of the alternatives considered by SEEL. |
| Section 7 – Construction / Operation / Decommissioning | Supplements Section 5 (Construction) of the March 2009 ES. | The construction, operation and decommissioning methods for the Proposed Development are considered to be largely the same as those described in the March 2009 ES. This Section provides a summary description. |

| *This Variation Application ES FID* | *The March 2009 ES* | *Comments* |
|---|---|---|
| Section 8 – Air Quality | Supplements Section 10 (Air Quality) of the March 2009 ES. | This Section has considered the potential effects of the Proposed Development on air quality.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not release any additional pollutants or substances to air to those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For Scenario 1, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not release any additional pollutants or substances to air to those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>o For Scenario 2, as the use of different technologies in the Proposed Development would alter the release of pollutants / substances to air to those reported in the March 2009 ES, an updated impact assessment has been provided. |
| Section 9 – Noise and Vibration | Supplements Section 9 (Noise and Vibration) of the March 2009 ES. | This Section has considered the potential noise and vibration effects of the Proposed Development.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not cause any additional noise and vibration to that reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For Scenario 1, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not cause any additional noise and vibration to that reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>o For Scenario 2, as the use of different technologies in the Proposed Development would alter the release of noise and vibration to that reported in the March 2009 ES, an updated impact assessment has been provided. |

| *This Variation Application ES FID* | *The March 2009 ES* | *Comments* |
|---|---|---|
| Section 10 – Landscape and Visual | Supplements Section 7 (Landscape and Visual) of the March 2009 ES. | This Section has considered the potential landscape and visual effects of the Proposed Development.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the structures / processes associated with the Proposed Development do not significantly differ from those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the structures associated with the Proposed Development will be located wholly within the limits of the Parameter Block Model developed for and assessed within the March 2009 ES, it is considered that no additional assessment is necessary. |

| *This Variation Application ES FID* | *The March 2009 ES* | *Comments* |
|---|---|---|
| Section 11 - Ecology | Supplements Section 13 (Ecology) of the March 2009 ES. | This Section has considered the potential effects of the Proposed Development on ecology.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, with the exception of bats, the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not release any additional pollutants or substances to air, land or water to those reported in the March 2009 ES. Therefore, it is considered that no additional assessment is necessary.<br>o In terms of bats, there is a need to update the bat emergence surveys to determine whether bats are now present on the proposed SEE site. Therefore, for construction / decommissioning, an updated impact assessment will be required if bats are now present on the proposed SEE site.<br>• During operation:<br>o For Scenario 1, the Proposed Development will not release any additional pollutants / substances to air, land or water to those reported in the March 2009 ES. Therefore, it is considered that no additional assessment is necessary.<br>o For Scenario 2, the use of different technologies in the Proposed Development would alter the release of pollutants or substances to air and the release of noise and vibration to that reported in the March 2009 ES, an updated air quality impact assessment and an updated noise and vibration impact assessment have been provided. These updated impact assessments are presented in Section 8 (Air Quality) and Section 9 (Noise and Vibration) respectively. |

| *This Variation Application ES FID* | *The March 2009 ES* | *Comments* |
|---|---|---|
| Section 12 – Ground Conditions (Geology and Land Contamination) | Supplements Section 11 (Ground Conditions) of the March 2009 ES. | This Section has considered the potential effects of the Proposed Development on ground conditions.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not release any additional pollutants or substances to land to those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not release any additional pollutants or substances to land to those reported in the March 2009 ES, it is considered that no additional assessment is necessary. |
| Section 13 – Water Resources and Flood Risk | Supplements Section 12 (Water Resources and Flood Risk) of the March 2009 ES. | This Section has considered the potential effects of the Proposed Development on water resources.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not release any additional pollutants or substances to water to those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not release any additional pollutants or substances to water to those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>As required by the Environment Agency, a Supplementary Flood Risk Assessment has also been provided. |

| *This Variation Application ES FID* | *The March 2009 ES* | *Comments* |
|---|---|---|
| Section 14 – Transport and Access | Supplements Section 8 (Transport and Access) of the March 2009 ES. | This Section has considered the potential effects of the Proposed Development on transport and access.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not generate any additional traffic movements to those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not generate any additional traffic movements to those reported in the March 2009 ES, it is considered that no additional assessment is necessary. |
| Section 15 – Archaeology and Cultural Heritage | No corresponding Section. | This Section has considered the potential effects of the Proposed Development on archaeology and cultural heritage.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the structures / processes associated with the Proposed Development will not significantly differ from those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the structures / processes associated with the Proposed Development will not significantly differ from those reported in the March 2009 ES, it is considered that no additional assessment is necessary. |

| *This Variation Application ES FID* | *The March 2009 ES* | *Comments* |
|---|---|---|
| Section 16 – Socio-Economics | Supplements Section 14 (Socio-Economics) of the March 2009 ES. | This Section has considered the potential socio-economic effects of the Proposed Development.<br>The baseline conditions are considered to be the same as those described in the March 2009 ES.<br>• During construction / decommissioning:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not result in social changes which differ to those reported in the March 2009 ES, it is considered that no additional assessment is necessary.<br>• During operation:<br>o For both Scenario 1 and Scenario 2, as the baseline conditions are considered to be the same as those described in the March 2009 ES and the Proposed Development will not result in social changes which differ to those reported in the March 2009 ES, it is considered that no additional assessment is necessary. |
| Section 17 – Cumulative Impacts | Supplements Section 15 (Indirect / Secondary and Cumulative Effects) of the March 2009 ES. | This Section has considered the potential cumulative effects of Proposed Development with other ancillary development / other planned developments and project. |
| Section 18 – Environmental Management | Supplements Section 6 (Environmental Management) of the March 2009 ES. | This Section has provided a Consolidated Summary of Mitigation and Monitoring, including reference (wherever relevant) to the Conditions associated within the Original Consent. |

# 4 SUMMARY OF POTENTIAL IMPACTS AND ENVIRONMENTAL MANAGEMENT

## 4.1 Overview

4.1.1 This Section summarises the potential impacts of SEE, and the environmental management measures (i.e. mitigation and monitoring measures) which have been proposed as part of the way in which SEE is constructed / operated / decommissioned.

## 4.2 Construction

4.2.1 The summary of the potential impacts and environmental management measures for construction are provided in Table 4.1.

***Environmental Management during Construction***

Construction Environmental Management Plan

4.2.2 The Construction Contractor will be required to prepare and implement a Construction Environmental Management Plan (CEMP). The purpose of the CEMP is to:

- Ensure that best practices are adopted, where appropriate, and maintained throughout construction;
- Provide a mechanism for ensuring that measures to prevent, reduce and, where possible, offset potentially adverse environmental impacts are implemented;
- Provide a framework for mitigating unexpected impacts during construction;
- Provide assurance to third parties that their requirements with respect to environmental conditions and performance will be met;
- Provide a mechanism for ensuring compliance with environmental legislation and statutory consents; and,
- Provide a framework against which to monitor and audit environmental performance.

4.2.3 Accordingly, the CEMP to be prepared and implemented for the Proposed Development will ensure construction work is completed in accordance with:

- The Conditions of the consent for SEE;
- SEEL's contractual requirements;
- Any environmental or other codes of conduct required by SEEL;
- Relevant specific mitigation measures; and,
- Current best practice.

4.2.4 The requirement to prepare, agree and implement a CEMP is provided by Condition 5(14) of the Original Consent.

Construction Hours

4.2.5 Initially and until the buildings are closed and capable of providing an 'indoor working environment', the normal site working hours will be: 0700 to 1900 hrs Monday to Friday; and, 0700 to 1700 hrs Saturday. No work on any Sunday or Bank Holidays is proposed to be undertaken, unless such work is associated with an emergency or does not cause existing ambient background noise levels to be exceeded.

4.2.6 Should a need arise, due to technical constraints or similar, with regard to carrying out certain construction work outside the above construction hours, prior written approval from South Holland District Council will be sought.

4.2.7 The requirement to adhere to these working hours is provided by Condition 5(17) of the Original Consent.

### 4.3 Operation

4.3.1 The summary of the potential impacts and environmental management measures for operation are provided in Table 4.2.

### 4.4 Decommissioning

4.4.1 As the likely impacts of decommissioning are expected to be similar (and of an equal or lower significance) as the likely impacts of construction, the potential impacts and environmental management measures for decommissioning are expected to be similar as those provided in Table 4.1 for construction.

**TABLE 4.1: SUMMARY OF POTENTIAL IMPACTS AND ENVIRONMENTAL MANAGEMENT MEASURES DURING CONSTRUCTION[4]**

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| Air Quality | Potential impacts include:<br>• Dust emissions which could arise from:<br>o Earth moving operations / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow; and,<br>o Construction plant / vehicle emissions; and,<br>o Vehicle movements.<br>• Unplanned emissions / releases / spills. | For earth moving / site levelling / construction of access roads / demolition of existing structures / foundations / concreting / back filling / site reinstatement / wind blow, a Dust Suppression Plan will be included in the CEMP. This will include the following measures:<br>• Appropriate siting of temporary laydown / storage areas (e.g. away from public / residential areas where reasonably and practically possible);<br>• Active management of temporary laydown / storage areas with fine, dry material will be stored within a central storage area;<br>• Damping down of any storage areas that are not enclosed;<br>• Avoidance of prolonged storage of debris;<br>• Planting / turfing of landscape areas as soon as practically possible so as to reduce levels of erosion through wind; and,<br>• Regular visual inspections to monitor for dry / dusty conditions will be carried out. | The requirement to prepare, agree and implement a CEMP is provided by Condition 5(14) of the Original Consent. |
| | | For construction plant / vehicle emissions, the CEMP will include the following measures:<br>• Construction plant / equipment will be kept in good order and maintained in accordance with the manufacturers specifications;<br>• Construction plant / equipment will not be left running when not in use;<br>• Construction plant / equipment with dust arrestment equipment will be used where practicable; and,<br>• Cleaner fuels will be employed for construction plant / equipment where practicable. | The requirement to prepare, agree and implement a CEMP is provided by Condition 5(14) of the Original Consent. |

[4] As the likely impacts of decommissioning are expected to be similar (and of an equal or lower significance), the environmental management measures for decommissioning are expected to be similar.

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| | | For vehicle movements, the CEMP will include the following measures:<br>• Damping down of haul roads during prolonged dry periods or as directed by the site manager;<br>• Restriction of speeds across the site;<br>• Minimisation of drop heights;<br>• Sheeting of vehicles carrying dusty materials into or out of the site to prevent any escape of materials;<br>• Provision of wheel wash facilities to minimise mud and debris on the local road network; and<br>• If any mud or debris is carried onto the local road network, employment of road sweeping vehicles to sweep / clear this away as soon and as safely as practicable. | The requirement to prepare, agree and implement a CEMP is provided by Condition 5(14) of the Original Consent.<br>The requirement to provide wheel wash facilities is provided by Condition 5(4) and Condition 5(5) of the Original Consent. |
| | | In terms of unplanned emissions / releases / spills, a Safety and Emergency Response Plan (ERP) will be prepared for SEE. | Prepare, agree and implement an ERP. |
| Noise and Vibration | Potential impacts include:<br>• Noise and vibration emissions from construction plant / equipment / vehicles. | All construction to be carried out in accordance with the recommendations in BS 5228 (2009) + A1 (2014): Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 (Noise) and Part 2 (Vibration). | This requirement is enforced by Condition 5(15) of the Original Consent. |
| | | Initially and until the buildings are closed and capable of providing an 'indoor working environment', the normal site working hours will be: 0700 to 1900 hrs Monday to Friday; and, 0700 to 1700 hrs Saturday.<br>No work on any Sunday or Bank Holidays will be undertaken, unless such work is associated with an emergency or does not cause existing ambient background noise levels to be exceeded.<br>Should a need arise, due to technical constraints or similar, with regard to carrying out certain construction work outside the above construction hours, prior written approval from South Holland District Council will be sought. | The requirement to adhere to these working hours is provided by Condition 5(17) and Condition 5(20) of the Original Consent. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| | | In addition, for any impact piling which may be required the site working hours will be: 0900 to 1800 hrs Monday to Friday; and, 0900 to 1300 hrs Saturday.<br>No work on any Sunday of Bank Holiday will be undertaken unless such work is associated with an emergency.<br>Should a need arise, due to technical constraints or similar, with regard to carrying out work outside the above hours, prior written approval from South Holland District Council will be sought. | The requirement to adhere to these working hours is provided by Condition 5(18) and Condition 5(20) of the Original Consent. |
| | | The CEMP will include the following measures:<br>• Use of 'silenced' construction plant / equipment, where appropriate;<br>• Maintenance of construction plant / equipment in accordance with the manufacturers specifications;<br>• 'Switching off' of construction plant / equipment when not in use;<br>• Use of acoustic screening / enclosures to suppress noisy equipment, where appropriate / practicable;<br>• Selection of electrically driven equipment in preference to internal combustion powered, where appropriate;<br>• Selection of hydraulic powered equipment in preference to pneumatic powered equipment, where appropriate; and,<br>• Selection of wheeled equipment in preference to tracked equipment. | The requirement to prepare, agree and implement a CEMP is provided by Condition 5(14) of the Original Consent. |
| | | Provision of a point of contact for adjacent properties / residents for any queries or complaints. | This requirement is enforced by Condition 5(26) of the Original Consent. |
| Landscape and Visual | Potential impacts include:<br>• Landscape impacts on landscape character and landscape features; and,<br>• Visual impacts due to the presence of construction plant / equipment / vehicles. | The CEMP will include the following measures:<br>• Appropriate siting of temporary laydown / storage areas;<br>• Careful design of the temporary laydown / storage area; and,<br>• Use of temporary 'task-orientated' and directional construction lighting only when required. | The requirement to prepare, agree and implement a CEMP is provided by Condition 5(14) of the Original Consent. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| Ecology | Potential impacts include:<br>• Habitat loss, fragmentation, degradation, damage and / or disturbance; and,<br>• Species mortality, injury and / or disturbance. | The implementation of the following measures:<br>• Demolition of existing structures (i.e. BSSSC and the disused administration building) following confirmation that bat species are absent and outside the bat activity season;<br>• Site clearance outside the breeding bird season;<br>• Use of temporary 'task-orientated' and directional construction lighting only when required; and,<br>• Provision of offsite biodiversity enhancements including:<br>o Removal of invasive plant species (e.g. Japanese Knotweed);<br>o Enhancement of reedbeds;<br>o Annual cutting of reeds on rotation;<br>o Bat boxes;<br>o Bird boxes / nest banks;<br>o Provision of artificial otter holt;<br>o Litter removal; and,<br>o Provision of interpretive signage.<br>The offsite biodiversity enhancements will be agreed with Natural England and South Holland District Council. | This requirement is enforced by Condition 5(42) of the Original Consent.<br>Furthermore, commitments are made through Schedule H (Biodiversity Enhancement Works) of the Section 106 Agreement. |

| ***Section*** | ***Potential Effect on the Environment*** | ***Mitigation and Monitoring Measure*** | ***Implementation*** |
|---|---|---|---|
| Ground Conditions (Geology and Land Contamination) | Potential impacts include:<br>• Release of contaminants due to removal of The Mound;<br>• Release of contaminants (e.g. ground gas) due to construction activities across the proposed SEE site;<br>• Discharges / emissions of pollutants to land; and,<br>• Unplanned emissions / releases / spills. | The implementation of the following measures:<br>• Ground investigation studies will be undertaken to identify the requirements for further specific risk assessments (e.g. those due to contamination of the soil and ground gas). These ground investigation studies will include testing for hydrocarbons and other contaminants, together with leachability testing. Any groundwater encountered during the ground investigation studies shall also be tested.<br>• Should any remediation / monitoring be required, this will take place in accordance with specific strategies / plans agreed with the Environment Agency and South Holland District Council.<br>• Asbestos surveys and environmental / demolition audits will be undertaken to identifying any specific requirements for the existing buildings occupying the proposed SEE site.<br>• Suitable material / demolition debris may be re-used on site where appropriate, or disposed of off site by an approved and licensed contractor in accordance with applicable regulations for treatment and disposal at an appropriate facility. | Requirements relating to the removal of the Mound are provided by Condition 5(6) of the Original Consent.<br>Requirements relating to ground investigation studies and remediation / monitoring are provided by Condition 5(33), Condition 5(34), Condition 5(35), Condition 5(36), Condition 5(37) and Condition 5(38) of the Original Consent. |
| | | In terms of unplanned emissions / releases / spills, a Safety and Emergency Response Plan (ERP) will be prepared for SEE.<br>This will note that storage of hydrocarbons / process chemicals / similar liquids must be on impervious bases and surrounded by impervious bund walls. The size of the bund shall be at least 110 per cent of the largest storage tank. Furthermore, this will note that all filling points / vents / sight glasses must be located within the bunded area, and there must be no drains through the bund floor or walls. All bunded areas containing acids / alkalis / sulphides shall also have an appropriate protective lining applied to the inner wall of the bunds. | These measures will be included in the tender specifications for SEE. Storage requirements are provided by Condition 5(30), Condition 5(31) and Condition 5(32) of the Original Consent. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| Water Resources and Flood Risk | Potential impacts include:<br>• Discharges / emissions of sediments or pollutants to watercourses / drains; and,<br>• Unplanned emissions / releases / spills. | A Drainage Strategy will be developed. This will include the following measures:<br>• Provisions to ensure that all existing drainage systems continue to operate so that owners upstream and downstream are not adversely affected;<br>• Provision to ensure that there is no discharge of water from the proposed SEE site until such a time as the permanent surface water drainage system is operational;<br>• Provisions to contain any run-off from the working area (e.g. a containment bund will be constructed around the perimeter of the site which will include an extension to the existing bund along Vernatt's Drain);<br>• Provisions to ensure that no leachate or surface water containing contaminants is allowed to enter, either directly or indirectly, into any water course;<br>• Provisions to ensure that any surface water run-off from areas where hydrocarbons are used is passed through oil / grit interceptors prior to discharge; and,<br>• Provision to ensure that all foul sewage drains to an approved foul sewerage and / or sewage disposal system.<br>The Drainage Strategy will clearly distinguish between temporary and permanent works / measures, and will note the proposed phasing of the works. | Drainage Strategy requirements are provided by Condition 5(27), Condition 5(28) and Condition 5(29) of the Original Consent. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| | | In terms of unplanned emissions / releases / spills, a Safety and Emergency Response Plan (ERP) will be prepared for SEE.<br>This will note that storage of hydrocarbons / process chemicals / similar liquids must be on impervious bases and surrounded by impervious bund walls. The size of the bund shall be at least 110 per cent of the largest storage tank. Furthermore, this will note that all filling points / vents / sight glasses must be located within the bunded area, and there must be no drains through the bund floor or walls. All bunded areas containing acids / alkalis / sulphides shall also have an appropriate protective lining applied to the inner wall of the bunds. | Prepare, agree and implement an ERP.<br>Storage requirements are provided by Condition 5(30), Condition 5(31) and Condition 5(32) of the Original Consent. |
| Transport and Access | Potential impacts include:<br>• Additional traffic in the form of HGVs / low loaders / construction personnel vehicles. | A Construction Transport Management Plan (CTMP) will be developed. The overall objective of the CTMP will be to actively manage potential issues relating to additional vehicle movements associated with the construction of SEE.<br>The CTMP will include details of the approved routes to and from the SEE site.<br>A framework for the CTMP is provided in Section 5 of the Transport Statement (Appendix 8.1 of the March 2009 ES). | The requirement to prepare, agree and implement a CTMP is provided by Condition 5(21) and Condition 5(22) of the Original Consent. |
| | | A Green Travel Plan will be developed to encourage the use of sustainable transport methods.<br>Provision will be made on the SEE site for secure cycle parking for ten bicycles (consisting of 5 Sheffield stands) situated convenient to the admin building. | This requirement is enforced by Condition 5(13) and Condition 5(12) of the Original Consent. |
| | | In addition, all HGV movements will be restricted to: 0700 to 1900 hrs Monday to Friday; and, 0800 to 1600 hrs Saturday.<br>There will be no HGV movements on any Sunday of Bank Holiday will be undertaken unless such work is associated with an emergency.<br>Should a need arise, due to technical constraints or similar, with regard to HGV movements outside the above hours, prior written approval from South Holland District Council will be sought. | The requirement to adhere to these hours is provided by Condition 5(19) and Condition 5(20) of the Original Consent. |
| | | In the interests of safety, reversing alarms will be fitted to all mobile plant on the site. | This requirement is enforced by Condition 5(16) of the Original Consent. |

| ***Section*** | ***Potential Effect on the Environment*** | ***Mitigation and Monitoring Measure*** | ***Implementation*** |
|---|---|---|---|
| Archaeology and Cultural Heritage | No impacts are predicted. | No mitigation / monitoring is considered necessary. | N / A |
| Socio-Economics | Short term employment opportunities, and increase in the use of local services and businesses. | No specific mitigation / monitoring is considered necessary. However, through the Principal Construction Contractor, SEEL is expecting a number of employment opportunities to be created for local people.<br>Furthermore, SEEL has committed to providing:<br>• An Employment Fund: Prior to commencement of operation, SEEL will contribute to a fund to "*enable the Council to promote employment by overcoming development constraints in Spalding, and to address the displacement of employment land resulting from the development of SEE*".<br>• An Education Fund: SEEL will contribute to a fund to promote apprenticeship schemes and maximise local employment opportunities and establish links with local agencies / colleges.<br>• Three Apprenticeships (or an Apprenticeship Fund) for a minimum of three years for persons residing in South Holland District. In the event that the apprenticeship positions are not filled, SEEL will contribute to a fund to "*provide engineering related educational bursaries and engineering apprenticeship schemes*".<br>• A Community, Sports, Leisure, Recreation and / or Open Space Fund: SEEL will contribute to a fund for "*new or additional facilities for community, sports, leisure, recreation uses and / or open space*". | These commitments are made through Schedule C (Employment), Schedule F (Education), Schedule E (Apprenticeships) and Schedule D (Community, Sports, Leisure, Recreation and / or Open Space) of the Section 106 Agreement. |

**TABLE 4.2: SUMMARY OF POTENTIAL IMPACTS AND ENVIRONMENTAL MANGEMENT MEASURES DURING OPERATION**

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| Air Quality | Potential impacts include:<br>• $NO_x$ emissions. | Activities on the proposed SEE site will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2010. | SEEL already holds an Environmental Permit for SEE (EPR/AP3732KC) which was issued in December 2010. An application to vary this Environmental Permit will be made in due course. |
| | | The following measures will be included in the design of the Proposed Development:<br>• The use of Dry Low $NO_x$ combustion technology to ensure $NO_x$ levels are in accordance with the requirements of Directive 20/75/EU on industrial emissions (the Industrial Emissions Directive (IED));<br>• The use of a fuel inherently low in sulphur; and,<br>• The use of stack(s) of a sufficient height and flue gases of a sufficient temperature and velocity to ensure good / adequate dispersion. | These measures will be included in the tender specifications for SEE. |
| | | SEEL will contribute to a fund for the acquisition of air quality monitoring equipment for South Holland District Council. | This commitment is made through Schedule B (Air Quality Monitoring) of the Section 106 Agreement. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| Noise and Vibration | Potential impacts include:<br>• Noise and vibration emissions from plant / equipment. | The following measures will be included in the design of the Proposed Development:<br>• Provision of high performance acoustic insulation to the gas turbine inlet ductwork;<br>• Provision of high performance splitter silencer to the gas turbine inlet to provide attenuation at high frequencies and abate compressor whine;<br>• Provision of acoustic enclosure for the gas turbine within the turbine building;<br>• Provision of acoustic panelling on the turbine building walls;<br>• Provision of high performance close fitting / spaced-off acoustic cladding on walls of the HRSG;<br>• Provision of high performance silencer to the outlet of the HRSG to provide attenuation at low frequencies;<br>• Provision of silencers to ventilation systems serving the turbine building, admin / control building and equipment enclosures to provide attenuation for ventilation fan noise and internal machinery noise;<br>• Provision of low-noise / low-speed fan ACCs; and<br>• Provision of diffuser/absorptive silencers to attenuate intermittent noise sources (such as start-up and emergency steam vents). | These measures will be included in the tender specifications for SEE. |
| | | Following commissioning, the requirements for On going Noise Monitoring for noise generated by commercial operation of the Proposed Development will be agreed with South Holland District Council. | This requirement is enforced by Condition 5(23) and Condition 5(24) of the Original Consent. |
| | | In the interests of maintaining neighbourly relations and residential amenity, SEEL will give a reasonable period of notice to residents and South Holland District Council prior to any planned non-normal operational events that would lead to an increase in noise levels.<br>Wherever possible, these planned events will be carried out between 0900 to 1800 hrs Monday to Friday. | This requirement is enforced by Condition 5(25) of the Original Consent. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| | | Provision of a point of contact for adjacent properties / residents for any queries or complaints.<br>In the event of a compliant by a local resident relating to noise levels during operation, an investigation will be carried out to determine the likely cause of the compliant and, if necessary, any available remedial measures.<br>Where it is deemed necessary by South Holland District Council, a written report detailing the remedial measures and their effectiveness will be provided. | This requirement is enforced by Condition 5(26) of the Original Consent. |
| Landscape and Visual | Potential impacts include:<br>• Landscape impacts on landscape character and landscape features; and,<br>• Visual impacts due to the presence of plant / equipment. | The Proposed Development will be located wholly within the SEE site. | The requirement for the Proposed Development to be located wholly within the SEE site is provided by Condition 5(2) of the Original Consent. |
| | | The design of equipment / buildings / enclosures will minimise regular and long-term maintenance requirements. Materials and finishes will be selected to meet this objective and to ensure that the appearance of the Proposed Development does not deteriorate materially over its operating lifetime (approximately 35 years). Materials and finishes will be similar to those used on existing CCGT power plants, and will be selected to be sympathetic the appearance of the surrounding land uses. | This requirement is enforced by Condition 5(7), Condition 5(8), Condition 5(9), Condition 5(10) and Condition 5(11) of the Original Consent. |
| | | A landscaping strategy has been developed which aims to enhance the ecological resource of the proposed SEE site, and maintain connectivity to ecological resources in the wider area.<br>Under the landscaping strategy:<br>• The landscaping proposals will incorporate native species; and,<br>• The Proposed Development will include a new SUDS water feature(s) to be planted with a fringe of emergent and marginal vegetation. The new feature(s) will provide similar wildlife habitat to that used by birds and invertebrates along Vernatt's Drain and the River Welland. | This requirement is enforced by Condition 5(39), Condition 5(40) and Condition 5(41) of the Original Consent. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
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| Ecology | Potential impacts relate to those arising under the headings of 'Air Quality' and 'Noise and Vibration'. | No specific mitigation / monitoring is considered necessary. However, SEEL has committed to the implementation of the following measures:<br>• Provision of offsite biodiversity enhancements including:<br>o Enhancement of reedbeds;<br>o Annual cutting of reeds on rotation;<br>o Bat boxes;<br>o Bird boxes / nest banks;<br>o Provision of artificial otter holt;<br>o Litter removal; and,<br>o Provision of interpretive signage.<br>The offsite biodiversity enhancements will be agreed with Natural England and South Holland District Council. | This requirement is enforced by Condition 5(42) of the Original Consent.<br>Furthermore, commitments are made through Schedule H (Biodiversity Enhancement Works) of the Section 106 Agreement. |
| Ground Conditions (Geology and Land Contamination) | Potential impacts include:<br>• Unplanned emissions / releases / spills. | The following measures will be included in the design of the Proposed Development:<br>• All foundations will be appropriately specified to resist chemical attack from soils or groundwater; and,<br>• All foundations will be designed so as not to present a preferential pathway for contamination migration. | These measures will be included in the tender specifications for SEE. |
| | | There will be appropriate drains within the various bunded areas, and all valves / couplings will be within the bunded area. In the event of oil leak / spill from any oil storage tank, any oil will be contained within the bunded area surrounding the storage tank. Any oil found in a bunded area will be removed by an approved and licensed contractor in accordance with applicable regulations for treatment and disposal at an appropriate facility.<br>An oil spill or chemical spill is recognised as being the principal environmental emergency that could arise at the SEE site. As such, a Safety and Emergency Response Plan will be produced for SEE which will include: emergency procedures for leaks / spills from chemical tanks; and, emergency procedures for leaks / spills of lubricating oil. | These measures will be included in the tender specifications for SEE.<br>Prepare, agree and implement an ERP. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| Water Resources and Flood Risk | Potential impacts include:<br>• Unplanned emissions / releases / spills; and,<br>• Flood Risk. | A Drainage Strategy will be developed. This will include the following measures:<br>• Provisions to ensure that no leachate or surface water containing contaminants is allowed to enter, either directly or indirectly, into any water course; and,<br>• Provision to ensure that all foul sewage drains to an approved foul sewerage and / or sewage disposal system.<br>The Drainage Strategy will clearly distinguish between temporary and permanent works / measures, and will note the proposed phasing of the works. | Drainage Strategy requirements are provided by Condition 5(27) and Condition 5(28) of the Original Consent. |
| | | There will be appropriate drains within the various bunded areas, and all valves / couplings will be within the bunded area. In the event of oil leak / spill from any oil storage tank, any oil will be contained within the bunded area surrounding the storage tank. Any oil found in a bunded area will be removed by an approved and licensed contractor in accordance with applicable regulations for treatment and disposal at an appropriate facility.<br>An oil spill or chemical spill is recognised as being the principal environmental emergency that could arise at the SEE site. As such, a Safety and Emergency Response Plan will be produced for SEE which will include: emergency procedures for leaks / spills from chemical tanks; and, emergency procedures for leaks / spills of lubricating oil. | These measures will be included in the tender specifications for SEE.<br>Prepare, agree and implement an ERP. |
| | | Re-grading and levelling will be undertaken to raise the majority of the proposed SEE site to 6.5 m AOD. This is the design flood level agreed with the Environment Agency. The substation will be raised to approximately 5.3 m AOD to facilitate interconnection with the existing Spalding CCGT generating station substation which is approximately 4.8 m AOD. | This requirement is enforced by Condition 5(43) of the Original Consent. |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| | | The Proposed Development will include a new SUDS water feature(s). The SUDS features will be provided by the use of a balancing pond(s) supplemented by the use of additional SUDS techniques including: permeable paving with a porous sub-base; filter drains; and, non-infiltration swales. | This requirement is enforced by Condition 5(44) of the Original Consent. |
| Transport and Access | Potential impacts include:<br>• Additional traffic during normal operation; and,<br>• Additional traffic during major outage periods. | A Green Travel Plan will be developed to encourage the use of sustainable transport methods.<br>Provision will be made on the SEE site for secure cycle parking for ten bicycles (consisting of 5 Sheffield stands) situated convenient to the admin building. | This requirement is enforced by Condition 5(13) and Condition 5(12) of the Original Consent. |
| | | SEEL will contribute to a fund for the provision, improvement and / or upgrading of cycleways and footpaths within South Holland District. | This commitment is made through Schedule A (Cycleways and Footpaths) of the Section 106 Agreement. |
| | | In the interests of safety, reversing alarms will be fitted to all mobile plant on the site. | This requirement is enforced by Condition 5(16) of the Original Consent. |
| Archaeology and Cultural Heritage | No impacts are predicted. | No mitigation / monitoring is considered necessary. | N / A |

| *Section* | *Potential Effect on the Environment* | *Mitigation and Monitoring Measure* | *Implementation* |
|---|---|---|---|
| Socio-Economics | Long terms employment opportunities, and increases in the use of local services and businesses. | No specific mitigation / monitoring is considered necessary. However, SEEL has committed to providing:<br>• An Employment Fund: Prior to commencement of operation, SEEL will contribute to a fund to *"enable the Council to promote employment by overcoming development constraints in Spalding, and to address the displacement of employment land resulting from the development of SEE".*<br>• An Education Fund: SEEL will contribute to a fund to promote apprenticeship schemes and maximise local employment opportunities and establish links with local agencies / colleges.<br>• Three Apprenticeships (or an Apprenticeship Fund) for a minimum of three years for persons residing in South Holland District. In the event that the apprenticeship positions are not filled, SEEL will contribute to a fund to *"provide engineering related educational bursaries and engineering apprenticeship schemes".*<br>• A Community, Sports, Leisure, Recreation and / or Open Space Fund: SEEL will contribute to a fund for *"new or additional facilities for community, sports, leisure, recreation uses and / or open space".* | These commitments are made through Schedule C (Employment), Schedule F (Education), Schedule E (Apprenticeships) and Schedule D (Community, Sports, Leisure, Recreation and / or Open Space) of the Section 106 Agreement. |