

# **Environmental Statement: Volume III**

## **Appendix 9G: Botanical Survey**

## **VPI Immingham OCGT Project**

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### **The Immingham Open Cycle Gas Turbine Order**

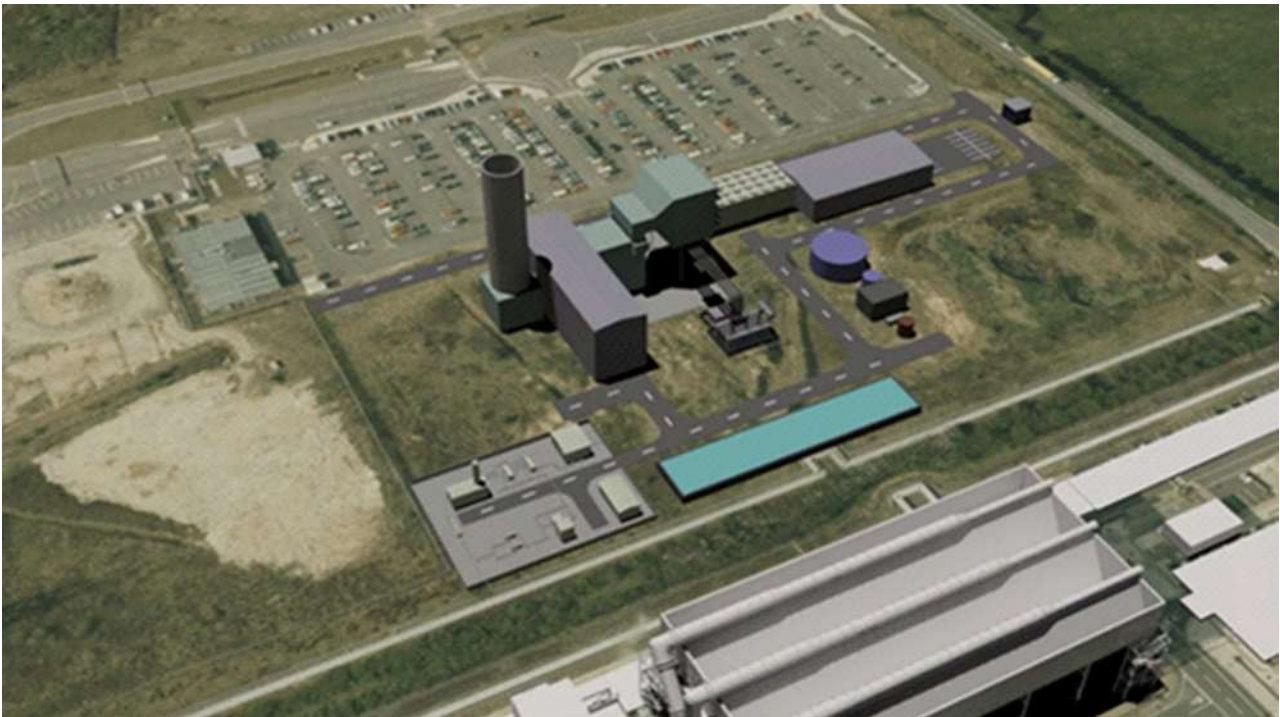
**Land to the north of and in the vicinity of the VPI Immingham Power Station, Rosper Road, South Killingholme, Lincolnshire, DN40 3DZ**

### **Environmental Statement Volume III Appendix 9G: Botanical Survey**

**The Planning Act 2008**

**The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(q)**

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**Applicant: VPI Immingham B Ltd**

**Date: April 2019**

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## DOCUMENT HISTORY

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## GLOSSARY

<b>Abbreviation</b>	<b>Description</b>
BAP	Biodiversity Action Plan
CHP	Combined Heat and Power
ES	Environmental Statement
GLNP	Greater Lincolnshire Nature Partnership
ha	Hectare
JNCC	Joint Nature Conservation Committee
LWS	Local Wildlife Site
NERC	Natural Environment and Rural Communities
OCGT	Open Cycle Gas Turbine
OMH	Open Mosaic Habitat
PEA	Preliminary Ecological Appraisal
PINS	The Planning Inspectorate
TLOR	Total Lindsey Oil Refinery

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## 1.0 INTRODUCTION

### 1.1 Introduction

1.1.1 This Appendix to the Environmental Statement (ES) presents the results of a botanical survey undertaken for the Proposed Development. The terms of reference used in this report are consistent with those defined within the main chapters of the ES (Volume I, Application Document Ref.6.2). This Appendix is intended to be read in conjunction with Chapter 9: Ecology of ES Volume I and the Preliminary Ecological Assessment (PEA, Appendix 9A, ES Volume III).

### 1.2 Survey Scope

1.2.1 A botanical survey was undertaken to establish whether the habitats supported any rare or notable species, and to determine whether the habitats met or exceeded Local Wildlife Site (LWS) selection criteria for 'Open Mosaic Habitats (OMH) on previously developed land' as set out in the Greater Lincolnshire Nature Partnership (GLNP) guidelines. Habitats within the main Open Cycle Gas Turbine (OCGT) power station area were identified as being of potential botanical interest during the field work associated with the PEA. The botanical survey area is shown on Figure 9H.1. This area is herein referred to as the 'Survey Area'.

1.2.2 No habitats of potentially high value were identified within the Existing VPI CHP Plant Site Access Site or Temporary Construction and Laydown Site. These areas were therefore not included within the botanical survey.

### 1.3 Survey Objectives

1.3.1 The purpose of the survey and the associated evaluation made in this report was to:

- Collect data on the botanical diversity and the relative abundances of plant species present in association with the previously identified habitats, which are components of the OMH resource;
- Collect data on the botanical diversity and the relative abundances of plant species present in association with the semi-improved neutral grassland; and
- Collect the above data in a manner that allows the results to be used to support an evaluation of relative nature conservation value, including review against GLNP's LWS selection criteria.

## **2.0 METHODS**

### **2.1 Botanical Survey**

2.1.1 The botanical survey was undertaken on 15<sup>th</sup> June 2018.

2.1.2 The survey involved a walkover inspection by an expert botanist. A detailed species list was compiled for all plant species observed in each of the following main OMH habitat types: ephemeral/short perennial habitat, tall ruderal, swamp, scattered scrub and bare ground with sparse/scattered ephemerals. A detailed species list was also compiled for all species observed in the stand of semi-improved neutral grassland.

2.1.3 For the purposes of this evaluation, shrub species (scattered scrub habitat) were listed within the underlying vegetation community in which they were growing.

### **2.2 Limitations**

2.2.1 There were no limitations to the completion of the botanical survey. The survey was undertaken in appropriate favourable weather conditions and in the appropriate season for the habitats being assessed.

## 3.0 SURVEY RESULTS

### 3.1 Summary of Botanical Interest

- 3.1.1 All flora recorded from the Survey Area are detailed in Annex 9H.1. The data is broken down by habitat. Photographs taken during survey are presented in Annex 9H.2.
- 3.1.2 The Survey Area as a whole supported a fairly diverse flora; ninety-five plant species were recorded all of which are native in origin, with the exception of sycamore (*Acer pseudoplatanus*).
- 3.1.3 No plant species were recorded that receive specific legal protection via Schedule 8 of the Wildlife and Countryside Act 1981 (as amended), or that are listed on Section 41 of the Natural Environment and Rural Communities (NERC) Act as being of 'principal importance' for nature conservation in England.
- 3.1.4 No plant species were recorded that are considered to be notable in terms of their national threat status and distribution as detailed in Joint Nature Conservation Committee (JNCC) (2018) and Stroh et al. (2014). No plant species were recorded which are considered to be notable in terms of their regional threat status and distribution as detailed in Kirby (2017).

### 3.2 OMH Interest

- 3.2.1 The broad characteristics of the OMH were defined in the preceding PEA report (Appendix 9A, Volume III), and this has not been revisited in this report. However, the detailed botanical survey undertaken in June has reinforced previous conclusions relating to the recognition of OMH in terms of the requirements detailed in Maddock (2011).
  - 1.1.1 The OMH is approximately 2.62 ha in area, so exceeds the minimum size requirements of 0.25 ha. The botanical list provided for the OMH in Annex 9H.1 covers the ephemeral/short perennial, tall ruderal, swamp vegetation, scattered scrub, and bare ground communities. The semi-improved neutral grassland component of the "brownfield" habitat is assessed separately as, while complementing the OMH, it is not considered to contribute to the combined resource of OMH.
  - 1.1.2 An approach for further assessment of the structural value of OMH is given in GLNP (2013). The relevant criterion (BM1, under the Brownfield mosaic section) is detailed below to inform presentation of the relevant data to allow the criterion to be applied in this report. Criterion BM1 requires a '*brownfield mosaic at least 0.25 ha in extent with loose substrate or bare ground and at least two of the early successional communities in Table 15 and a minimum brownfield features index score of four using Table 16. At least one early successional community should be flower-rich.*' The tables referenced are given in GLNP (2013), but the associated communities and features are summarised below in Tables 9H.1 and 9H.2, along with summary information on the presence of these in the Survey Area.
  - 1.1.3 The survey area did not fully meet GLNP (2013) criteria for the identification of notable areas of OMH. On this basis, the OMH associated with the Survey Area is not of LWS quality.

**Table 9G.1: Presence/ Absence of Early Successional Vegetation Communities Used to Identify Notable OMH (based on Table 15 of GLNP, 2013)**

Brownfield early successional community	Definition	Present in Survey Area	Supporting comments
Relatively open bryophyte communities on the ground	A fine-grained mosaic. These should not form dense carpets that restrict other species.	x	Bryophytes are not a prominent feature of the survey area and do not form fine-grained mosaics.
Diverse or abundant lichen communities on the ground	To include foliose (leaf-like), crustose (crust) and/or fruticose (shrubby and branched) growth forms.	x	No foliose and/or fruticose lichen communities are present within the survey area. Crustose lichens associated with the artificial substrates are rare.
Inundation	Comprises plant species suited to periodic flooding, usually interspersed with bare areas of mud, e.g. marsh foxtail ( <i>Alopecurus geniculatus</i> ), toad rush ( <i>Juncus bufonius</i> ), lesser spearwort ( <i>Ranunculus flammula</i> ).	x	There is locally extensive bare mud in the OMH associated with the archaeological field trenches. These are seasonally inundated during the winter, drying out during the spring. Aquatic macrophytes and plant species suited to periodic flooding are absent.
Sparse, short-sward grassland	Comprises mainly perennial stress-tolerant species amongst grass species and patches of bare ground, e.g. sheep's-fescue ( <i>Festuca ovina</i> ), cat's-ear ( <i>Hypochaeris radicata</i> ), mouse-ear hawkweed ( <i>Hieracium pilosella</i> ), sheep's sorrel ( <i>Rumex acetosella</i> ).	x	The perennial species that grow amongst grass species and bare ground are competitive ruderal species rather than stress tolerant species i.e. great willowherb ( <i>Epilobium hirsutum</i> ), rosebay willowherb ( <i>Chamerion angustifolium</i> ) and creeping thistle ( <i>Cirsium arvense</i> ). There is a paucity of stress-tolerant perennial species such as cat's-ear, mouse-ear hawkweed and sheep's sorrel within the OMH.
Annual colonisers (flower-rich)	Short sward. Comprises mainly stress-tolerant species suited to low nutrient availability and shallow soils, e.g. thyme-leaved sandwort ( <i>Arenaria sepyllifolia</i> ), common centaury ( <i>Centaureum erythraea</i> ), fairy flax ( <i>Linum catharticum</i> ), hare's-foot clover ( <i>Trifolium arvense</i> ).	x	A fairly diverse ephemeral flora is present. Stress tolerant species present include common centaury, scarlet pimpernel ( <i>Anagallis arvensis</i> ) and yellow-wort ( <i>Blackstonia perfoliata</i> ), however these species are rare or occasional. Therefore, based on the respective DAFOR scores for the annual colonisers recorded and the restricted diversity of annual colonisers, this early successional community is not considered to be flower-rich.  Also, the areas where annual colonisers are a prominent feature of the vegetation are localised and this vegetation is not widespread or abundant throughout the extent of the OMH.



Brownfield early successional community	Definition	Present in Survey Area	Supporting comments
Ruderal colonisers (flower-rich)	Comprises species that are usually the first to colonise disturbed ground; generally more typical of more nutrient-rich areas than the annual community described above, e.g. wild carrot ( <i>Daucus carota</i> ), common toadflax ( <i>Linaria vulgaris</i> ), weld ( <i>Reseda luteola</i> ), common mallow ( <i>Malva sylvestris</i> ), teasel ( <i>Dipsacus fullonum</i> ), evening-primrose ( <i>Oenothera</i> agg).	✓	The OMH includes a ruderal element. Common fleabane ( <i>Pulicaria dysenterica</i> ) is abundant and there is frequent common ragwort ( <i>Senecio jacobaea</i> ), willowherbs, bristly ox-tongue ( <i>Picris echioides</i> ) and teasel. There is rare blue fleabane and weld. The species diversity for the ruderal colonisers is fairly diverse and there are opportunities for invertebrates in terms of the availability of pollen/nectar sources throughout the extent of the late spring, summer and autumn seasons.
Grassland (flower-rich)	Comprises a more mature, closed grassland sward with a high proportion of robust flowering herbs, e.g. common knapweed ( <i>Centaurea nigra</i> ), common bird's-foot-trefoil ( <i>Lotus corniculatus</i> ), meadow buttercup ( <i>Ranunculus acris</i> ), red clover ( <i>Trifolium pretense</i> ).	x	The semi-improved neutral grassland, which comprises a continuous block of a more mature sward, is assessed separately in this report as it is not part of the matrix of habitats forming the OMH (see paragraph 3.2). Also the species diversity in terms of flowering herbs is fairly restricted at the interface boundary between the OMH and semi-improved neutral grassland. Therefore the community is not considered to be flower-rich in terms of providing a diversity of flower-rich habitat for invertebrates throughout the extent of the spring, summer and autumn seasons.
Heathland (flower-rich)	Comprises generally a more open structure and less plant litter than typical heath; may be interspersed with lichens, lower plants and grasses, e.g. heather, wavy hair-grass, mat-grass, sheep's-fescue.	x	Not present
Number of criteria required		2 of 8 (including 1 of 4 flower-rich types)	
<b>Number of LWS selection criteria met</b>		<b>1 of 8 (including 1 of 4 flower-rich types)</b>	

**Table 9G.2: Presence/ Absence of Brownfield Features Used to Identify Notable OMH (based on Table 16 of GLNP, 2013)**

Brownfield feature	Definition	Present in Survey Area	Supporting comments
Variation in topography and substrate	Includes humps, hollows and depressions; piles/mounds of rubble, gravel, sand and ash; and significantly broken-up concrete and tarmac. These provide natural and artificial habitat variation at ground level.	✓	The whole survey area, including OMH areas, shows variation in topography. Substrates include sandy and gravelly clay with localised chalk/brick and sandstone. There are localised areas of broken-up concrete.
South-facing slopes, banks and cliffs	Provide important basking and burrowing habitat for reptiles and invertebrates, receiving direct sunlight for a large proportion of the day.	x	There are a number of slopes, banks and cliffs associated with the OMH, however these are rarely south facing. The most extensive banks and cliffs are north facing.
Variation in sward height and structure; including tussocks of grass, rush or sedge	Areas of short sward, taller herb species and tussocks, providing structural diversity within the vegetation.	x	Although there is an interface at the boundary of the OMH and the closed semi-improved neutral grassland, there is not an intimate mosaic in terms of variations in sward height/structure throughout the extent of the OMH. Therefore the OMH is not a good-fit to this brownfield feature.
Unmanaged areas of dead and dying plant matter	Includes stems, leaves, flower heads, seed heads, standing and fallen dead trees. These habitats are important for over-wintering and nesting insects.	✓	The OMH is unmanaged so dead vegetation is left standing (for example wild teasel). This is supplemented by interfaces with the semi-improved neutral grassland.
Areas of scrub	These should cover no more than 2.5% of the site and should not threaten detrimental encroachment into other habitats within the mosaic. Scrub should be structurally and/or botanically diverse.	x	There are localised areas of scattered scrub within the OMH, however there is little structural and botanical diversity; semi-mature sallow ( <i>Salix</i> spp.) is the dominant shrub species. The scrub is therefore not a good fit to this brownfield feature.
Ephemeral wet/damp areas	Includes naturally occurring or artificially created damp areas that are at or close to the water table, marginal habitat surrounding standing water, and the seasonal accumulation of water on the ground.	✓	There is one linear area of temporary standing water associated with a former archaeological field trench. This dries out during the summer months.
Permanent ponds/pools/wetlands	Provide (and should include) shallow margins, wide drawdown zones, a variety of water depths and emergent vegetation; all of which are important habitats	✓	There are two ponds in the north-eastern part of the OMH. Although these dried out in the summer months, the central sections held water throughout the summer and they are

Brownfield feature	Definition	Present in Survey Area	Supporting comments
	for invertebrates.		considered 'permanent' for the purposes of this screening. The margins of the ponds grade into seasonally inundated bare areas These supported stands of emergent abundant bulrush ( <i>Typha latifolia</i> ) and common spike-rush ( <i>Eleocharis palustris</i> ), with rare grey club-rush ( <i>Schoenoplectus tabernaemontani</i> ).
Activities that will maintain the bare substrate	Includes rabbit activity, or acceptable levels of human activity such as dirt-biking or quarrying. These should not be so intensive that irreparable damage is incurred.	✓	The bare substrate is subject to low levels of human activity associated with Total Lindsey Oil Refinery activities.
Number of criteria required		4 (of 8)	
<b>Number of criteria met</b>		<b>5 (of 8)</b>	

### 3.3 Semi-Improved Neutral Grassland Interest

3.3.1 An approach for the assessment of the value of the semi-improved neutral grassland is given in GLNP (2013). The relevant criterion (NG1, under Grassland [neutral and calcareous], Section 3.3 of the Local Wildlife Site Guidelines for Greater Lincolnshire) is reviewed below to inform subsequent assessment of the nature conservation value of the grassland in Section 4 of this report.

3.3.2 Criterion NG1 requires a 'neutral grassland of at least 0.1 ha in extent, or linear areas at least 50m long, with a minimum species index score of eight using Table 7'. Table 9H.3 below identifies the presence in the grassland of plant species considered in GLNP (2013) to be indicators of good quality neutral grassland. The grassland is 0.68 ha in area so exceeds the minimum size criterion (0.1 ha). However, the Survey Area does not meet the required criterion for the minimum number of scoring species. On this basis the neutral grassland associated with the survey area is not of LWS quality.

**Table 9G.3: Summary of the Presence of Plant Species Considered Indicative of Good Quality Neutral Grassland (based on GLNP, 2013)**

Common name	Latin name
Wild angelica	<i>Angelica sylvestris</i>
Glaucous sedge	<i>Carex flacca</i>
Common spotted-orchid	<i>Dactylorhiza fuchsia</i>
Cat's-ear	<i>Hypochaeris radicata</i>
Meadow vetchling	<i>Lathyrus pratensis</i>

Common name	Latin name
Number of scoring species required to meet GNLPS (2013) criteria for LWS quality	8
<b>Number of Scoring Species within Survey Area</b>	<b>5</b>

## 4.0 CONCLUSIONS AND EVALUATION

4.1.1 This section provides an assessment of the botanical features present to determine their nature conservation value using the assessment methods detailed in the ES (Volume 1). There is no reasonable likelihood of the botanical features present being of international or national nature conservation importance, so this can be discounted.

### 4.2 Overall Botanical Diversity

4.2.1 No plant species were recorded that were considered to be notable in terms of their national or regional threat status and distribution. All plant species recorded in the Survey Area are generally widespread and common in Lincolnshire and are not of nature conservation concern. Therefore the nature conservation value assigned to all plant species, when assessed on their individual merits, is no more than Local value.

### 4.3 Open Mosaic Habitat

4.3.1 The OMH within the Survey Area is considered to represent an example of the NERC Act Section 41 'OMH habitat', but it does not meet GLNP LWS selection criteria relating to brownfield features. Given this, the OMH is not evaluated to be of County value. District value is considered justified as the brownfield habitat within the Survey Area meets the criteria for NERC Act S41 open mosaic priority habitat, and some of the LWS selection criteria for brownfield habitat.

### 4.4 Semi-improved Neutral Grassland

4.4.1 The semi-improved neutral grassland has developed on artificial boulder clay substrate and this heavily modified habitat is therefore considered to be a poor-fit to the "Lowland Meadow" Habitat Action Plan that is included in the Lincolnshire BAP (Lincolnshire Biodiversity Partnership, 2011) and also the "Lowland Meadow" Priority Habitat as detailed in Maddock (2011).

4.4.2 Although the habitat is not of LWS quality (equivalent to county value) it does support a reasonably high proportion (approx. 63 %) of the required indicator species for neutral grassland. On this basis, district value seems appropriate given herb-rich grassland is becoming increasingly uncommon in Lincolnshire due to intensification of agricultural techniques, and replacement of stock farming with arable and horticultural enterprises (Lincolnshire Biodiversity Partnership, 2011).

## 5.0 REFERENCES

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## Annex 9G.1 Botanical Species List

Common name	Latin name	Ephemeral habitat	Tall ruderal	Swamp	Bare ground	Semi-improved neutral grassland
Sycamore	<i>Acer pseudoplatanus</i>					✓(R)
Creeping bent	<i>Agrostis stolonifera</i>	✓(O)				✓(O)
Scarlet pimpernel	<i>Anagallis arvensis</i>	✓(O)				
Wild angelica	<i>Angelica sylvestris</i>					✓(R)
Cow parsley	<i>Anthriscus sylvestris</i>					✓(O)
False oat-grass	<i>Arrhenatherum elatius</i>		✓(F)			✓(LF)
Common orache	<i>Atriplex patula</i>	✓(R)				
Winter-cress	<i>Barbarea vulgaris</i>		✓(R)			
Daisy	<i>Bellis perennis</i>	✓(R)				✓(R)
Yellow-wort	<i>Blackstonia perfoliata</i>	✓(R)				
Sea club-rush	<i>Bolboschoenus maritimus</i>			✓(O)		✓(LO)
Black mustard	<i>Brassica nigra</i>		✓(R)			
Glaucous sedge	<i>Carex flacca</i>					✓(O)
False fox-sedge	<i>Carex otrubae</i>					✓(LF)
Fern grass	<i>Catapodium rigidum</i>	✓(R)				
Common knapweed	<i>Centaurea nigra</i>	✓(R)				✓(O)
Common centaury	<i>Centaureum erythraea</i>	✓(R)				
Common mouse-ear	<i>Cerastium fontanum</i>	✓(O)				✓(R)
Rough chervil	<i>Chaerophyllum temulum</i>					✓(R)

Common name	Latin name	Ephemeral habitat	Tall ruderal	Swamp	Bare ground	Semi-improved neutral grassland
Rosebay willowherb	<i>Chamerion angustifolium</i>	✓ (F)				✓ (R)
Fat-hen	<i>Chenopodium album</i>		✓ (O)			
Creeping thistle	<i>Cirsium arvense</i>	✓ (O)	✓ (A)			✓ (O)
Marsh thistle	<i>Cirsium palustre</i>					✓ (O)
Spear thistle	<i>Cirsium vulgare</i>	✓ (O)	✓ (O)			✓ (O)
Hemlock	<i>Conium maculatum</i>		✓ (A)			
Field bindweed	<i>Convolvulus arvensis</i>	✓ (R)				✓ (R)
Hawthorn	<i>Crataegus monogyna</i>					✓ (R)
Cock's-foot	<i>Dactylis glomerata</i>	✓ (R)				✓ (F)
Common spotted-orchid	<i>Dactylorhiza fuchsii</i>					✓ (O)
Wild carrot	<i>Daucus carota</i>	✓ (O)				✓ (O)
Tufted hair-grass	<i>Deschampsia cespitosa</i>	✓ (F)	✓ (O)			✓ (A)
Wild teasel	<i>Dipsacus fullonum</i>	✓ (F)	✓ (F)			✓ (LF)
Common spike-rush	<i>Eleocharis palustris</i>			✓ (LA)		✓ (LO)
Great willowherb	<i>Epilobium hirsutum</i>	✓ (LF)	✓ (F)			
Hoary willowherb	<i>Epilobium parviflorum</i>	✓ (R)			✓ (O)	
Square-stalked willowherb	<i>Epilobium tetragonum</i>	✓ (F)			✓ (O)	
Field horsetail	<i>Equisetum arvense</i>	✓ (F)				✓ (O)
Blue fleabane	<i>Erigeron acris</i>	✓ (R)				
Common cottongrass	<i>Eriophorum angustifolium</i>					✓ (LR)



Common name	Latin name	Ephemeral habitat	Tall ruderal	Swamp	Bare ground	Semi-improved neutral grassland
Red fescue	<i>Festuca rubra</i> agg.	✓ (O)				✓ (F)
Common cudweed	<i>Filago vulgaris</i>	✓ (R)				
Cut-leaved crane's-bill	<i>Geranium dissectum</i>	✓ (O)				
Bristly oxtongue	<i>Helminthotheca echioides</i>	✓ (F)				
Hogweed	<i>Heracleum sphondylium</i>					✓ (O)
Yorkshire-fog	<i>Holcus lanatus</i>	✓ (R)	✓ (R)			✓ (F)
Cat's-ear	<i>Hypochaeris radicata</i>					✓ (O)
Jointed rush	<i>Juncus articulatus</i>	✓ (O)				
Soft rush	<i>Juncus effusus</i>	✓ (R)				✓ (R)
Hard rush	<i>Juncus inflexus</i>	✓ (R)				✓ (O)
Great lettuce	<i>Lactuca virosa</i>		✓ (R)			
Prickly lettuce	<i>Lactuca serriola</i>	✓ (O)	✓ (O)			
Meadow vetchling	<i>Lathyrus pratensis</i>					✓ (O)
Common bird's-foot-trefoil	<i>Lotus corniculatus</i>	✓ (O)				
Scented mayweed	<i>Matricaria chamomilla</i>	✓ (R)				
Black medick	<i>Medicago lupulina</i>	✓ (O)				✓ (O)
Melilot species	<i>Melilotus sp.</i>					✓ (R)
Field forget-me-not	<i>Myosotis arvensis</i>	✓ (R)				✓ (O)
Early forget-me-not	<i>Myosotis ramosissima</i>	✓ (O)				
Bee orchid	<i>Ophrys apifera</i>					✓ (R)
Ribwort plantain	<i>Plantago lanceolata</i>	✓ (F)				✓ (F)
Annual meadow-grass	<i>Poa annua</i>	✓ (R)				✓ (R)

Common name	Latin name	Ephemeral habitat	Tall ruderal	Swamp	Bare ground	Semi-improved neutral grassland
Rough meadow-grass	<i>Poa trivialis</i>	✓ (O)	✓ (F)			✓ (F)
Creeping cinquefoil	<i>Potentilla reptans</i>	✓ (F)				✓ (F)
Cowslip	<i>Primula veris</i>	✓ (R)				
Selfheal	<i>Prunella vulgaris</i>	✓ (O)				✓ (O)
Common fleabane	<i>Pulicaria dysenterica</i>	✓ (LA)				✓ (A)
Meadow buttercup	<i>Ranunculus acris</i>	✓ (R)				✓ (O)
Water-crowfoot sp.	<i>Ranunculus</i> subgenus <i>batrachium</i>			✓ (R)		
Creeping buttercup	<i>Ranunculus repens</i>	✓ (O)				✓ (O)
Weld	<i>Reseda luteola</i>	✓ (R)				
Dog rose	<i>Rosa canina</i> agg.					✓ (R)
Bramble spp.	<i>Rubus fruticosus</i> agg.	✓ (F)				✓ (O)
Curled dock	<i>Rumex crispus</i>	✓ (O)	✓ (O)			✓ (O)
Procumbent pearlwort	<i>Sagina procumbens</i>	✓ (R)				
Goat willow	<i>Salix caprea</i>	✓ (F)				✓ (O)
Grey willow	<i>Salix cinerea</i>	✓ (O)				✓ (O)
Tall fescue	<i>Schedonorus arundinaceus</i>					✓ (LF)
Grey club-rush	<i>Schoenoplectus tabernaemontani</i>			✓ (LO)		
Hoary ragwort	<i>Senecio erucifolius</i>					✓ (O)
Common ragwort	<i>Senecio jacobaea</i>	✓ (F)				✓ (R)
Bittersweet	<i>Solanum dulcamara</i>					✓ (R)
Hedge woundwort	<i>Stachys sylvatica</i>					✓ (R)
Dandelion	<i>Taraxacum</i> agg.	✓ (R)				✓ (R)

Common name	Latin name	Ephemeral habitat	Tall ruderal	Swamp	Bare ground	Semi-improved neutral grassland
Goat's-beard	<i>Tragopogon pratensis</i>					✓(R)
Lesser trefoil	<i>Trifolium dubium</i>	✓(R)				✓(O)
Red clover	<i>Trifolium pratense</i>					✓(O)
Scentless mayweed	<i>Tripleurospermum inodorum</i>	✓(R)				
Colt's-foot	<i>Tussilago farfara</i>	✓(F)	✓(O)			✓(O)
Bulrush	<i>Typha latifolia</i>				✓(A)	
Gorse	<i>Ulex europaeus</i>					✓(LR)
Common nettle	<i>Urtica dioica</i>		✓(O)			✓(R)
Tufted vetch	<i>Vicia cracca</i>					✓(R)
Narrow-leaved vetch	<i>Vicia sativa ssp. nigra</i>					✓(R)
Smooth tare	<i>Vicia tetrasperma</i>					✓(R)
Squirreltail fescue	<i>Vulpia bromoides</i>	✓(O)			✓(R)	

**Footnote:** The relative abundance of each species using the DAFOR scale: D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare. The prefix L is used where species are Local (patchy) in distribution.

## Annex 9G.2 Photographs



**Photo 1:** Raised mound in the background supporting tall ruderal community with north-facing bare banks and cliffs. The area in the foreground is a flat area of ephemeral vegetation.



**Photo 2:** A pile of broken concrete and artificial cobbles/gravel supporting ruderal colonisers (eg. weld and rosebay willowherb). This brownfield habitat type is a localised feature of the Survey Area, particularly in the south-eastern part of the Survey Area near the car park



**Photo 3:** The boundary between the open ephemeral (on the left) and the more closed community of the neutral grassland adjacent to Rosper Road (on the right). Note the fly-tipping of garden peat in the foreground



**Photo 4:** Neutral grassland on the southern boundary of the Survey Area at the base on a mound supporting tall ruderal vegetation. Common fleabane is a conspicuous component of the herb community. Abundant tufted hair-grass and occasional rushes are indicative of impeded drainage resulting from the underlying boulder clay substrate.



**Photo 5:** Localised pond in the north-eastern part of the Survey Area supporting abundant bulrush. The open ephemeral habitat is apparent in the background.



**Photo 6:** Bee orchid growing in the neutral grassland next to the Total Lindsey Oil Refinery car park. This species was rarely recorded on the northern boundary of the neutral grassland.



**Photo 7:** Fairly flat area of ephemeral habitat with bare areas between the raised mounds. There is scattered and occasional tufted hair-grass which is indicative of impeded drainage.



**Photo 8:** Neutral grassland on the southern periphery of the Survey Area. There are small localised patches of either sea club-rush, false fox-sedge or common spike rush indicating impeded drainage.



**Photo 9:** Showing the varied topography at the Survey Area and scattered sallow scrub. The transition between the ephemeral habitat component of the OMH and the more closed characteristic of the neutral grassland is evident.



**Photo 10:** Neutral grassland on the southern boundary of the Survey Area, with localised patches of abundant false fox-sedge. The continuous hawthorn dominated scrub to the right of the pipeline screens the VPI Immingham Power Station when viewing from the north-west.



**Photo 11:** The ephemeral habitat in the north-eastern part of the Survey Area. The trackway supports an open community of annual colonisers and is indicative of the human disturbance that occurs at the Survey Area.



**Photo 12:** Permanent pond in the north-eastern part of the Survey Area supporting abundant bulrush and underlying abundant common spike-rush.



**Photo 13:** Abundant common spike-rush associated with the swamp habitat.

**Photo 14:** Grey club-rush and common spike-rush in the swamp habitat.



**Photo 16 (15<sup>th</sup> June):** The small stand of common cotton-grass growing in the neutral grassland and boulder clay substrate. In the lowlands this species is more typical of bogs/fens and peat substrate.

**Photo 17 (15<sup>th</sup> June):** Neutral grassland habitat, showing a stand of glaucous sedge and abundant common fleabane in the background. This habitat forms a continuous block of a more closed community rather than a 'fine grained' open mosaic of grassland and bare ground.



**Photo 18:** False-fox sedge is a locally frequent component of the neutral grassland

**Photo 19:** Patch of sea club-rush within the neutral grassland.



**Photo 21:** Tufted hair-grass, common fleabane and scattered scrub are features of the neutral grassland. The habitat is subject to low levels of human disturbance (eg. movement by vehicles), however there is a general paucity of unvegetated bare areas within the sward.

**Photo 22:** Bulrush and rushes indicating the presence of a permanent pond.





**Photo 23:** North-facing bare banks associated with open ephemeral vegetation provides suitable habitat for burrowing bees and wasps. Ruderal colonisers (for example wild teasel) provide pollen/nectar sources for invertebrates.



**Photo 24:** Raised mounds support tall ruderal vegetation (note hemlock and creeping thistle in the foreground). Permanent pond area with abundant bulrush below the mound in the background



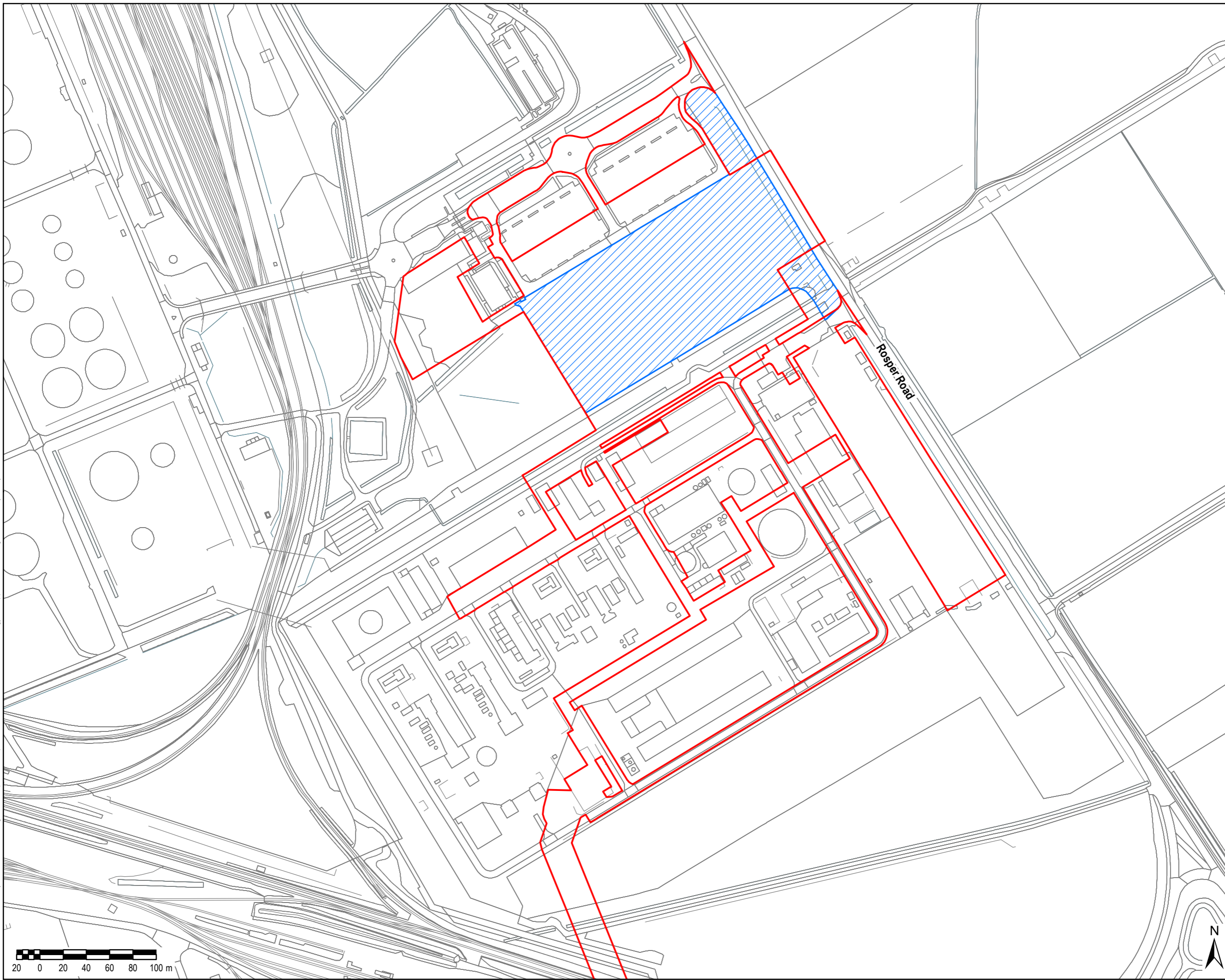
**Photo 25:** Tall ruderal vegetation with umbellifers, false oat-grass and common ragwort.



**Photo 26:** Tall ruderal vegetation with hemlock and great willowherb.

## Figure 9G.1 Botanical Survey

File Name: K:\5004 - Information Systems\60547702\Immingham Gas Pipeline\02\_Maps\Power Plant Site\OCGT Full ES 2019\Ecology\PEA Appendix to the ES\Figure 9H.1 Botany Survey Locations.mxd



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**LEGEND**

- Proposed Development
- Botany Survey Area

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Purpose of Issue  
**ENVIRONMENTAL STATEMENT**

Client  
**VPI IMMINGHAM B LTD**

Project Title  
**PROPOSED 299MW OCGT POWER STATION**

Drawing Title  
**BOTANY SURVEY LOCATIONS  
FIGURE 9G.1**

Drawn JW	Checked BB	Approved MS	Date 15/03/2019
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