

Scoping report

Wrexham Energy Centre
and Connections

November 2012

Contents

1. Introduction	7
The promoter	7
The proposed development	7
The need for the development	8
EIA and EIA scoping	9
The structure of this report	9
Consultation	10
Consenting approach	10
2. Planning and legislative context	13
National policy statements	13
Welsh planning policy	14
Local planning policy	15
Other material considerations	17
3. The proposed development	19
Introduction	19
Site location and surroundings	19
Proposed plant	20
Design	22
Access	23
Electricity connection	23
Gas connection	25
Combined heat and power	26
Carbon capture readiness	27
Construction	28

4. Alternatives and scheme evolution	33
Introduction	33
Approach	33
Electricity generating options	34
The selection of CCGT technology	34
Site selection	35
Power station design options	37
Gas connection	39
Electricity grid connection	40
Carbon capture and storage	40
Conclusions	40
5. Summary and proposed structure of the ES	41
Summary	41
Proposed structure of the ES	42
6. Scope of the environmental impact assessment	45
Consultation	45
Air quality	45
Ground conditions	57
The water environment	73
Ecology	80
Landscape and visual	96
Noise and vibration	105
Transport and traffic	110
Socio-economic effects	115
Cultural heritage	121
Health, safety and security	128
Waste	130
Agriculture	134

Tables

Table 1: National and European air quality criteria	47
Table 2: DEFRA 2010 annual mean background concentrations, µg/m ³	50
Table 3: Designated ecological sites	51
Table 4: Preliminary conceptual site model	65
Table 5: Risk estimation - classification of probability	68
Table 6: Risk estimation - classification of consequence	68
Table 7: Estimation of the level of risk by comparison of consequence and probability	70
Table 8: Significance criteria – contaminated land risk and part 2A status	71
Table 9: Importance of the environmental attributes of the water feature or resource	77
Table 10: Magnitude of potential effects	78
Table 11: Criteria for assessing the significance of potential effect	78
Table 12: Existing reports for the Wrexham Energy Centre site study area	81
Table 13: Study areas for the Wrexham Energy Centre site	82
Table 14: Great crested newt survey results (2010)	87
Table 15: Landscape and visual effects - issues for EIA	103
Table 16: Heritage Sites within a 5 km Radius of the WEC Site	122
Table 17: Heritage Sites within a 1 km of the Connection Route Corridors	123
Table 18: Criteria for identifying the value of an asset	126
Table 19: Criteria for the scale of beneficial and adverse changes	126
Table 20: Waste management significance assessment criteria	133
Table 21: Significance of effect on agricultural land quality	137
Table 22: Significance of effect on local agricultural businesses	138

Appendices

Appendix 1: Table of consultees
Appendix 2: Site location plan and environmental constraints
Appendix 3: WEC: Stage one feedback report
Appendix 4: Phase 1 habitat plan
Appendix 5: LVIA provisional viewpoints

Glossary

Full text	Acronym	Notes
Agricultural Land Classification	ALC	
Air Quality Management Area	AQMA	
Air Quality Strategy	AQS	
Ancient Woodland Inventory	AWI	
Annual Average Daily Traffic	AADT	
Best Available Technique	BAT	
Birds of Conservation Concern	BoCC	
Calculation of Road Traffic Noise	CRTN	
Carbon Capture Ready	CCR	
Combined Cycle Gas Turbine	CCGT	
Combined Heat and Power	CHP	
Construction Environmental Management Plan	CEMP	
Construction Industry Research and Information Association	CIRIA	
Countryside Council for Wales	CCW	
Department of Energy and Climate Change	DECC	
Design Manual for Roads and Bridges	DMRB	
Development Consent Order	DCO	
Electromagnetic Fields	EMF	
Environment Agency	EA	
Environment Protection Act	EPA	
Environmental Assessment Levels	EAL	
Environmental Impact Assessment	EIA	
Environmental Permitting	EP	
Environmental Statement	ES	
Environmental Statement – non-technical summary	ES-NTS	
Guidelines for Landscape and Visual Impact Assessment	GLVIA	
Health and Safety Executive	HSE	
Health Protection Agency	HPA	
Heat Recovery Steam Generator	HRSG	
Heavy Duty Vehicle	HDV	
Habitat Suitability Index	HSI	
Infrastructure Planning Commission	IPC	Abolished through the Localism Act 2011. However, several documents and regulations still refer to the

Full text	Acronym	Notes
		IPC. In such circumstances the term “IPC” should be read as “PINS”
Landscape and Visual Impact Assessment	LVIA	
Landscape Institute	LI	
Local Development Plan	LDP	
Local Nature Reserve	LNR	
Local Wildlife Site	LWS	
Megawatts	MW	
Multi Agency Geographical Information for the Countryside	MAGIC	
National Nature Reserve	NNR	
National Planning Policy Framework	NPPF	
National Transmission System	NTS	The strategic natural gas pipeline network serving the UK
Nationally Significant Infrastructure Project	NSIP	
Non-Ionizing Radiation Protection	ICNIRP	
Open Cycle Gas Turbine	OCGT	
Planning Inspectorate	PINS	
Planning Policy Statements	PPS	
Pollution Prevention Control	PPC	
Preliminary Environmental Information	PEI	
Site of Special Scientific Interest	SSSI	
Soil Handling and Management Strategy	SHMS	
Source Protection Zone	SPZ	
Special Area of Conservation	SAC	
Special Protection Area	SPA	
Statement of Community Consultation	SOCC	
Sustainable Urban Drainage System	SUDS	
Technical Advice Note	TAN	
Department for Transport	DfT	
Institute of Environmental Management	IEMA	
Transport Analysis Guidance	TAG	
Unitary Development Plan	UDP	
United Nations Economic Commission for Europe	UNECE	
Visual Envelope	VE	
Wales Spatial Plan	WSP	

Full text	Acronym	Notes
Waste Management Licensing	WML	
Welsh Air Quality Network Forum	WAQF	
World Health Organisation	WHO	
Wrexham County Borough Council	WCBC	
Wrexham Energy Centre	WEC	Refers specifically to the CCGT site
Wrexham Energy Centre and Connections	WECC	Refers to the CCGT site, electricity connection and gas connection collectively
Wrexham Industrial Estate	WIE	
Wrexham Power Limited	WPL	

1. Introduction

The promoter

- 1.1 On behalf Wrexham Power Limited (WPL) Savills and Atkins have been instructed to carry out an environmental impact assessment (EIA) and produce an environmental statement (ES) to identify the likely significant environmental effects of the proposed combined cycle gas turbine (CCGT) power station, overhead power line, gas pipeline and other infrastructure works.
- 1.2 WPL is a joint venture between St. Modwen and Glenfinnan Properties, established with the intention of promoting a new power station development at Wrexham. Both companies have extensive experience in the development and economic regeneration of sites throughout the UK, including experience in the energy sector.
- 1.3 WPL has employed a project team comprising:
 - Atkins - engineering design and environmental consultants
 - Savills - town planning and property consultants
 - Local Dialogue - community and stakeholder relations;
 - Pinsent Masons - legal advisers
- 1.4 The team is tasked with developing the power station proposals in dialogue with Wrexham County Borough Council (WCBC), landowners, the local community and other interested parties in order to secure a Development Consent Order for the proposed Wrexham Energy Centre.

The proposed development

- 1.5 WPL is promoting the development of the Wrexham Energy Centre and Connections (WECC) which will comprise a new CCGT power station at Wrexham Industrial Estate in North Wales which will have an electrical generation capacity of up to 1,200 megawatts (MW). It will require a connection from the national gas transmission network and a connection to the electricity grid. The proposal constitutes a Nationally Significant Infrastructure Project (NSIP) under the terms of the Planning Act 2008 and therefore an application for a development consent order (DCO) is to be made to the Planning Inspectorate (PINS), who will examine the DCO application on behalf of the Secretary of State.
- 1.6 The CCGT is likely to comprise two separate turbine houses each containing a gas and steam turbine driving a common generator. The power station would require a cooling system to condense the exhaust steam from the steam turbine. It would also include an electricity sub-station on-site for the export of electricity to the grid. In addition there would be smaller buildings including for the station control room, offices, stores and water treatment plant.

The need for the development

- 1.7 National policy in relation to NSIPs, such as that proposed, is set out in the National Policy Statements (NPSs). Under the Planning Act 2008 the NPSs form the basis for decisions on NSIP applications, which must also take into account other matters set out in the Planning Act 2008, including any material considerations.
- 1.8 The Overarching National Policy Statement for Energy (EN-1)¹, designated in 2011, sets out the need for new electricity generating stations. It should be noted that the NPSs refer to the Infrastructure Planning Commission (IPC) as the examining body for NSIPs. However, the IPC was abolished through the Localism Act 2011 with (broadly) its decision-making responsibilities transferred to the Secretary of State and its examining responsibilities transferred to PINS. References in this scoping report to the IPC are therefore to be read as referring to PINS / the Secretary of State as appropriate.
- 1.9 NPS EN-1 states at paragraph 3.3.7 that 'at least 22 GW of existing electricity generating capacity will need to be replaced in the coming years, particularly to 2020. This is as a result of tightening environmental regulation and ageing power stations.'
- 1.10 It continues at paragraph 3.3.15 that 'In order to secure energy supplies that enable us to meet our obligations for 2050, there is an urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible, and certainly in the next 10 to 15 years, given the crucial role of electricity as the UK decarbonises its energy sector.'
- 1.11 It is in this context that paragraphs 3.1.1 – 3.1.3 state:
- '3.1.1 The UK needs all the types of energy infrastructure covered by this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions.*
- 3.1.2 It is for industry to propose new energy infrastructure projects within the strategic framework set by Government. The Government does not consider it appropriate for planning policy to set targets for or limits on different technologies.*
- 3.1.3 The IPC should therefore assess all applications for development consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need is as described for each of them in this Part.'*
- 1.12 The need for the proposed development is therefore confirmed in national policy.

¹ Overarching National Policy Statement for Energy (EN-1), Department of Energy and Climate Change, July 2011

EIA and EIA scoping

- 1.13 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (IP (EIA) Regulations 2009), as amended by The Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2012 impose requirements in relation to the carrying out of EIA on certain NSIP proposals, including the proposed WECC.
- 1.14 Scoping is an early stage in the EIA process and is designed to ensure that the environmental studies consider all the relevant factors and provide all relevant information required to assess the potential significant effects of the proposed development.
- 1.15 In accordance with paragraph 8 (1) of the IP (EIA) Regulations 2009 this scoping report is being submitted alongside a formal scoping opinion request, with the intention that it should inform the scoping opinion from the Secretary of State (although this function is in practice delegated to and carried out by PINS). The IP (EIA) Regulations require that a request made under paragraph 8 (1) must include:
- a plan sufficient to identify the land
 - a brief description of the nature and purpose of the development and of its possible effects on the environment
 - such other information or representations as the person making the request may wish to provide or make
- 1.16 Before adopting a scoping opinion PINS must take account of the following, which are detailed in this Scoping Report:
- the specific characteristics of the particular development
 - the specific characteristics of development of the type concerned
 - the environmental features likely to be affected by the development
- 1.17 PINS is required under the IP (EIA) Regulations to consult with the person who made the request and the 'consultation bodies' (as defined in the Regulations). There is a statutory requirement for a scoping opinion to be issued within 42 days following the date of receipt of the request. If a consultation body does not respond within 28 days of being consulted, PINS is entitled to assume that the consultation body in question does not have any comments on the information to be provided in the ES (Regulation 8(11) of the IP (EIA) Regulations 2009).

The structure of this report

- 1.18 Chapter two of this report summarises the planning and legislative context for the proposed development.
- 1.19 Chapter three gives a broad and provisional description of the proposed development– this is at an early stage in the design process, but the information is considered to be sufficient to enable a scoping opinion to be issued.
- 1.20 Chapter four outlines the proposed approach to and methodology in appraising alternatives and options as the design of the project evolves.

- 1.21 Chapter six describes the principal environmental topics that will need to be assessed in the ES. An overview of each environmental issue is then provided. The proposed structure of the ES is set out in chapter five of this report.

Consultation

- 1.22 The Planning Act 2008 and the associated secondary legislation set out comprehensive provisions for consultation with relevant parties prior to submission of a DCO application. One element of this is a requirement for a Statement of Community Consultation (SOCC), which will be discussed with WCBC prior to publication. The SOCC will set out how WPL intends to consult with the local community, including residents in the vicinity of the land it wants to develop. It will also set out how the local community can access the Preliminary Environmental Information (PEI) which will be prepared by WPL in due course.
- 1.23 In addition, WPL will consult with relevant local authorities, other 'statutory consultees' and persons with an interest in land that is affected by the proposed development.
- 1.24 The 'statutory consultees' are set out in the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended). WPL may also consult with other 'non-prescribed' bodies as appropriate. The statutory consultees who will be consulted are detailed at appendix 1 of this Scoping Report.
- 1.25 Throughout the pre-application stage, consultees and members of the public will have the opportunity to submit representations on the proposed development, which will be taken into account by WPL as the proposals evolve and are refined.
- 1.26 WPL has begun preliminary informal (i.e. non-statutory) consultation including public consultation events, presentations and meetings with the local community, local authority, business community and certain prescribed consultees. The feedback received during this informal consultation is summarised in a Stage One Consultation Report at Appendix 3.
- 1.27 The output from formal (i.e. statutory) consultation that WPL will undertake under Sections 42 and 47 of the Planning Act 2008 will be summarised in a consultation report, which will be submitted with the DCO application.

Consenting approach

- 1.28 The Planning Act 2008 classifies electricity generating stations with a capacity of over 50 MWe as NSIPs. The Act requires that the promoter of a NSIP applies for a DCO for the development.
- 1.29 As noted above, the proposed DCO application will be examined by PINS, which will subsequently report to the Secretary of State for Energy and Climate Change, who will make the final decision on the application.
- 1.30 The consenting approach for the WECC follows the requirements of the Planning Act 2008, as amended by the Localism Act 2011, and policy / guidance documents published by central government and PINS.
- 1.31 WPL proposes to apply for one DCO incorporating two NSIPs. One NSIP is the Wrexham Energy Centre (WEC) and the integral gas pipeline between the WEC

and former Maelor gas works at Talwrn, the second NSIP is the 400kV overhead power line connection connecting the CCGT power station to the existing National Grid Legacy substation to the south west of Wrexham.

- 1.32 The provisions of the Planning Act 2008 allow '*associated development*' to be included as part of a DCO application. However, the Act only permits a limited range of activities which can be categorised as '*associated development*' in Wales. These restrictions on associated development therefore apply to the proposed WEC.
- 1.33 Under the Planning Act 2008, the DCO application process comprises five main stages:
- Pre-application
 - Submission and acceptance of application
 - Pre-examination
 - Examination
 - Decision
- 1.34 WPL intends to submit a DCO application in the second half of 2013 - this permits adequate time for the completion of the EIA studies and ES and for consultation with interested parties. The application will be examined within a six month period, after which PINS has three months to issue its report to the Secretary of State, who then has a further three months to issue a decision.

2. Planning and legislative context

National policy statements

- 2.1 National Policy Statements have been designated to guide the examination and determination of DCO applications. The NPSs relevant in the context of the proposed WECC are:
- EN1 - Overarching National Policy Statement for Energy
 - EN2 - National Policy Statement for Fossil Fuel Electricity Generating Infrastructure
 - EN4 - National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines
 - EN5 - National Policy Statement for Electricity Networks Infrastructure
- 2.2 The NPSs are briefly outlined below and will be considered fully through the EIA process, and compliance with them reported in the ES.

EN-1 - Overarching National Policy Statement for Energy

- 2.3 NPS EN-1 sets out overall national policy for energy infrastructure, which is then considered in more detail in the technology-specific NPSs.
- 2.4 Much of EN-1 is concerned with the assessment principles and generic effects of new electricity generation capacity. These are reflected in the matters covered in this report and are not considered here further.

EN-2 - National Policy Statement for Fossil Fuel Electricity Generation Infrastructure

- 2.5 EN-2 supplements the generic guidance of EN-1. Paragraph 2.3 sets out the government's policy criteria for fossil fuel generating stations, including the need to demonstrate that opportunities for CHP have been fully explored, that new generation capacity of over 300 MWe can demonstrate carbon capture readiness, and that projects embrace good design, particularly in respect of landscape and visual amenity and the mitigation of effects such as noise and vibration, transport effects and air emissions (Para 2.3.16).

EN-4 - National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines

- 2.6 Much of EN-4 is concerned with the new gas import and storage infrastructure that is required now that the UK has become a net gas importer, and which is not directly relevant to the proposed WEC. However, paragraph 2.19 addresses gas and oil pipelines and identifies factors that should influence site selection by project promoters. These include noise and vibration, biodiversity, landscape and visual effects, soil and geology, and the effects on water quality and resources.

EN-5 - National Policy Statement for Electricity Networks Infrastructure

- 2.7 EN-5 serves a similar function to EN-4 with respect to new grid and transformer infrastructure. Once again, it sets out the factors that should influence site selection and the need to consider good design. In addition to the environmental considerations identified in EN-4, EN-5 also draws attention for the need to take into account electric and magnetic fields.

Welsh planning policy

Planning Policy Wales – Edition 5, November 2012

- 2.8 Planning Policy Wales (PPW) sets out the Welsh Government's land use planning policies.
- 2.9 Part 12.8 of PPW relates to policies governing sustainable energy. It focuses primarily on renewable energy technologies but also aims to facilitate delivery of the Welsh Government's Energy Policy Statement.
- 2.10 PPW confirms the Welsh Government's commitment to optimising low carbon energy generation at paragraph 12.8.8, and facilitating CHP where feasible.
- 2.11 The provisions of PPW will be considered fully in the EIA process and reported in the ES.

Planning Policy Statements and Guidance

- 2.12 The Welsh Government has published a series of Technical Advice Notes (TANs) which, in conjunction with Planning Policy Wales, set out the Government's land use planning policies. Due regard will therefore be given to the following TANs during the EIA process:
- **Technical Advice Note 5:** Nature Conservation and Planning (2009)
provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation.
 - **Technical Advice Note 11:** Noise (1997)
advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development
 - **Technical Advice Note 12:** Design (2009)
provides advice on good design
 - **Technical Advice Note 15:** Development and Flood Risk (2004)
provides technical guidance (which supplements the policy set out in PPW) in relation to development and flooding
 - **Technical Advice Note 18:** Transport (2007)
describes how to integrate land use and transport planning. Explains how transport effects should be assessed and mitigated

- **Technical Advice Note 22:** Sustainable Buildings (2010)
guidance to help developers to implement the national planning policy on sustainable buildings

Local planning policy

Wrexham Unitary Development Plan, adopted February 2005

- 2.13 The Unitary Development Plan (UDP) was adopted by WCBC on the 14 February 2005, and will remain as the statutory development plan for the area until replaced by a new Local Development Plan (LDP).
- 2.14 Part 1 of the UDP sets out the strategic policies applicable to the whole plan area. Policy PS1 directs new development to within existing settlement and employment areas, whilst Policy PS2 aims to ensure that new development does not detrimentally affect the countryside, landscape/townscape character, or the quality of the natural environment. Policy PS3 sets out the WCBC's preference for new development to be on brownfield sites, stating that where greenfield sites are to be developed, sites of ecological, landscape or amenity value and good quality agricultural land should be avoided.
- 2.15 The UDP Proposals map, as illustrated in the extract at Figure 1, overleaf, shows that the site is allocated under Policy E3 which states:
- 'Land is allocated at Owens Corning Fibreglass, Wrexham Industrial Estate for a major single user employment project that requires a site of over 30 hectares for an employment development that cannot be accommodated on allocated employment land or employment land with planning permission.'*
- 2.16 Policy E3 requires that any new development on the site will be required to incorporate extensive high quality landscaping to mitigate the visual impact of the development on the neighbouring countryside and local landscape.

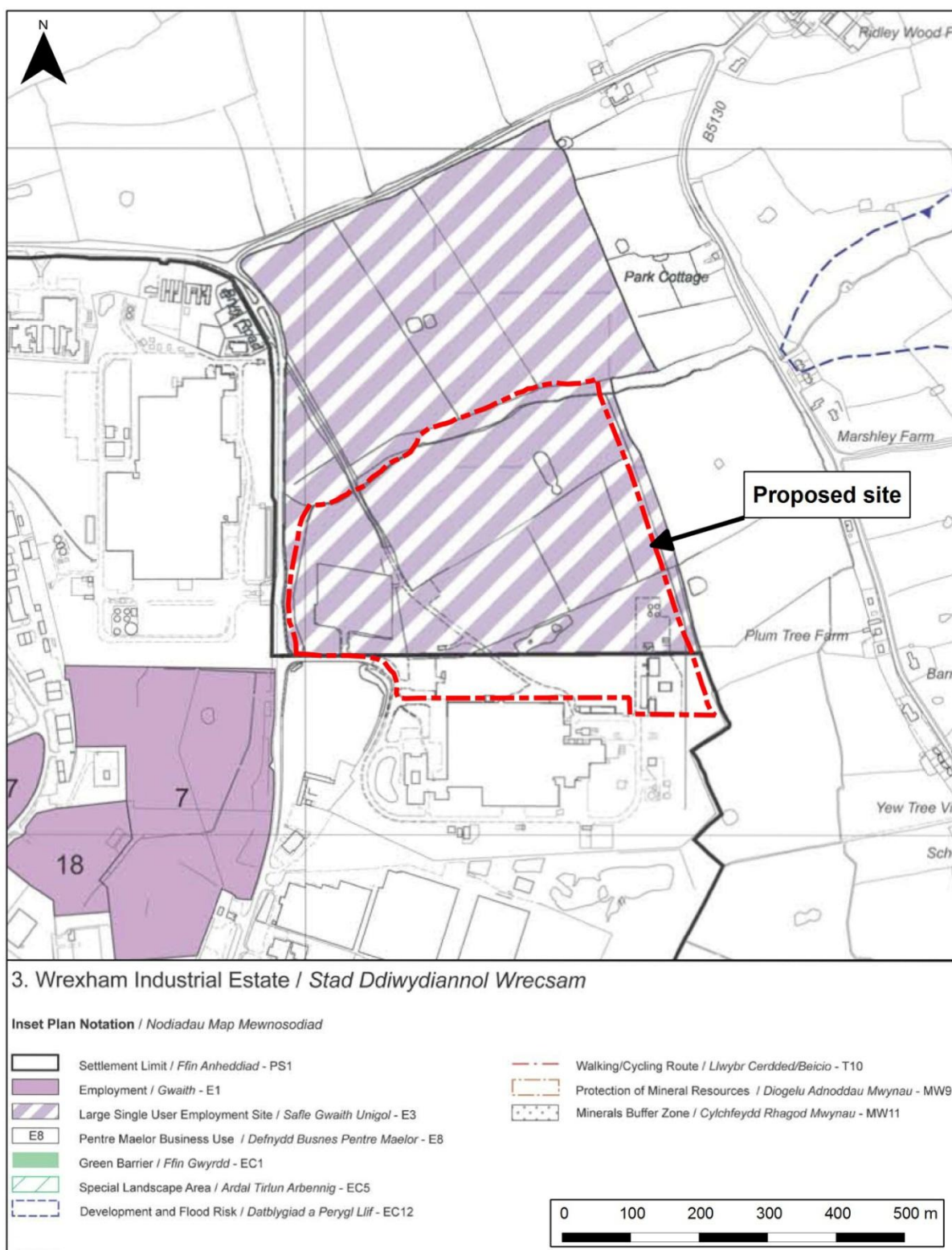


Figure 1: UDP Proposals Map extract with proposed WEC site overlain

Other material considerations

Planning history

- 2.17 In May 2010 planning permission was granted for the development of 45,390 square metres of B8 development and 2,144 square metres B1 development on the site. The appeal decision recognised the site as the only site on the Wrexham Industrial Estate available for large scale development of the type proposed. Figure 2 illustrates the approved development red line boundary on the WEC site.



Figure 2: Approved B2/B8 development layout

People, Places, Futures: The Wales Spatial Plan – 2008 Update, July 2008

- 2.18 The Wales Spatial Plan (WSP) is not part of the formal development plan, although it is a statutory document to which Local Planning Authorities must have regard when developing their LDPs. The WSP separates Wales into regions, with Wrexham located in the North East Wales – Border and Coast region. The plan also identifies a 'hub', encompassing Wrexham, Mold, Broughton, Connah's Quay, Deeside and Chester, in which there is an aim to focus investment in employment, housing, retail, leisure and services. The WSP places a strong emphasis on developing sustainable communities and prioritising the development of brownfield sites in preference to greenfield land.

- 2.19 The dependence of the north-east Wales economy on the manufacturing sector is highlighted in the WSP, as is the vulnerability of this sector to changes in the global economy. Nevertheless, the WSP places significant emphasis on how the north-east Wales economy can continue to build on its significant strengths. This is to be achieved by improving the quality and value of existing sectors and developing them further. The WSP also advises at paragraph 16.23 that the establishment of new / incoming businesses should be encouraged.
- 2.20 The WSP emphasises the Welsh Government's aim to promote sustainable development and to support the economy. The Welsh Government's objectives for economic growth are to:
- enhance the economic success of both urban areas and the countryside, helping businesses to maximise their competitiveness
 - support initiative and avoid placing unnecessary burdens on enterprise
 - respect and encourage diversity in the local economy
 - promote the exploitation of new technologies which can provide new opportunities
 - ensure that development for enterprise and employment uses is in line with sustainability principles and respects the environment in its location, scale and design, especially so as to address climate change
- 2.21 The spatial plan requires local authorities to ensure that land is available for enterprise and employment uses to meet both identified and unidentified need.

3. The proposed development

Introduction

- 3.1 As explained in the opening chapter, WPL is promoting the development of a new CCGT power station in North Wales. The proposed power station will have an electrical generation capacity of up to 1,200 MW. It will require a connection from the national gas transmission network and a connection to the electricity grid. These connections are integral to the project as a whole in terms of both EIA and the subsequent operation of the completed development.

Site location and surroundings

- 3.2 As illustrated in Figure 3, the site is located approximately 3.5 km east of Wrexham within the boundary of WCBC. The site, known as the Kingmoor Park South, is situated within the eastern boundary of the large Wrexham Industrial Estate, including an area of land formerly occupied by the Owens Corning Fibreglass factory. A more detailed location plan can be found at appendix 2. Also provided at appendix 2, drawing 5105324-WRX-ENV-002-RevB shows the locations of some of the environmental constraints that have been considered in the development of the proposals.

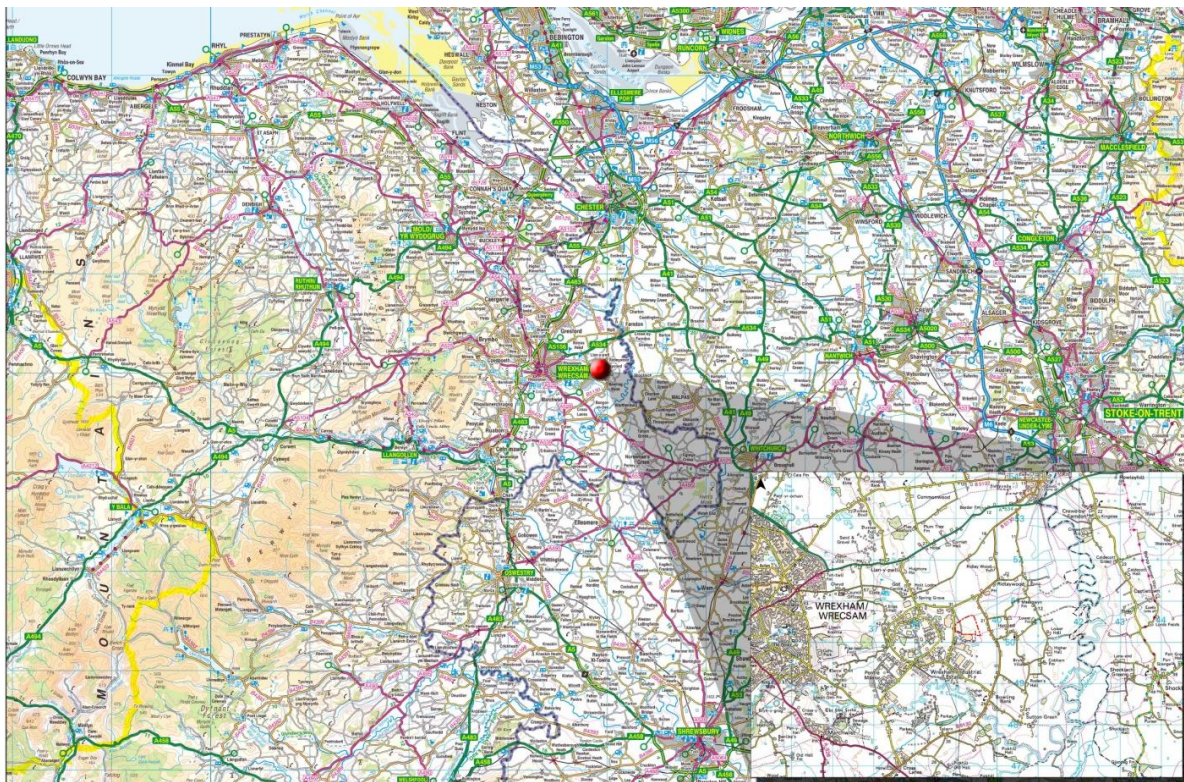


Figure 3: Site location – not to scale (© Crown copyright, license number 100024244 Savills (L&P) Limited)

- 3.3 To the south of the site there is a large logistics warehouse and distribution centre operated by Norbert Dentressangle. Immediately west of the site is a Kellogg's food processing complex. This includes a range of tall industrial structures, including chimneys.
- 3.4 The proposed WEC site comprises a parcel of mixed brownfield and greenfield land, with a broadly level terrain. The southern third of the site comprises brownfield land. This includes a level area of hardstanding and the footings of a demolished fibre-glass factory in the south-eastern corner of the site, and the associated staff car park in the south-western corner, adjacent to the main site entrance off Bryn Lane. In between the former factory and car park are areas of land that appear to have been raised by deposition of demolition spoil and landscaped ponds set amongst areas of scrub. What might broadly be described as the northern part of the site comprises farmland with well-defined field boundaries featuring mature hedgerows and trees.
- 3.5 The site is bound along its eastern and northern boundaries by mature trees and hedges. The tree belt along the northern site boundary, running on an east to west alignment, contains a number of trees subject to a Tree Preservation Order. In combination with the tree belts and hedgerows within the site, these boundary features provide a reasonable degree of visual containment at ground level.
- 3.6 The indicative grid references of the project are:
- **Wrexham Energy Centre site:** centred on 339268, 350396
 - **electrical connection** endpoints: begins 339586, 350172, terminates 329473, 348454
 - **gas connection** endpoints: begins 339507, 350432, terminates 338535, 347945

Proposed plant

- 3.7 A CCGT power station utilises an efficient combination of gas and steam turbines to generate electricity. In the gas turbine, air is compressed and passed into a combustion chamber where it is burnt with natural gas fuel to produce hot combustion gases at high pressure. This thermal and pressure energy is converted to mechanical energy by expanding the combustion gas through the gas turbine which drives a power turbine and air compressor. The power turbine is connected to a generator which produces electrical power. The hot exhaust gases from the gas turbine are passed to an unfired boiler (usually referred to as a heat recovery steam generator or HRSG) to produce steam. This steam is in turn passed through a steam turbine to drive another generator to produce more electrical power. Figure 4 shows a typical schematic of a CCGT station.

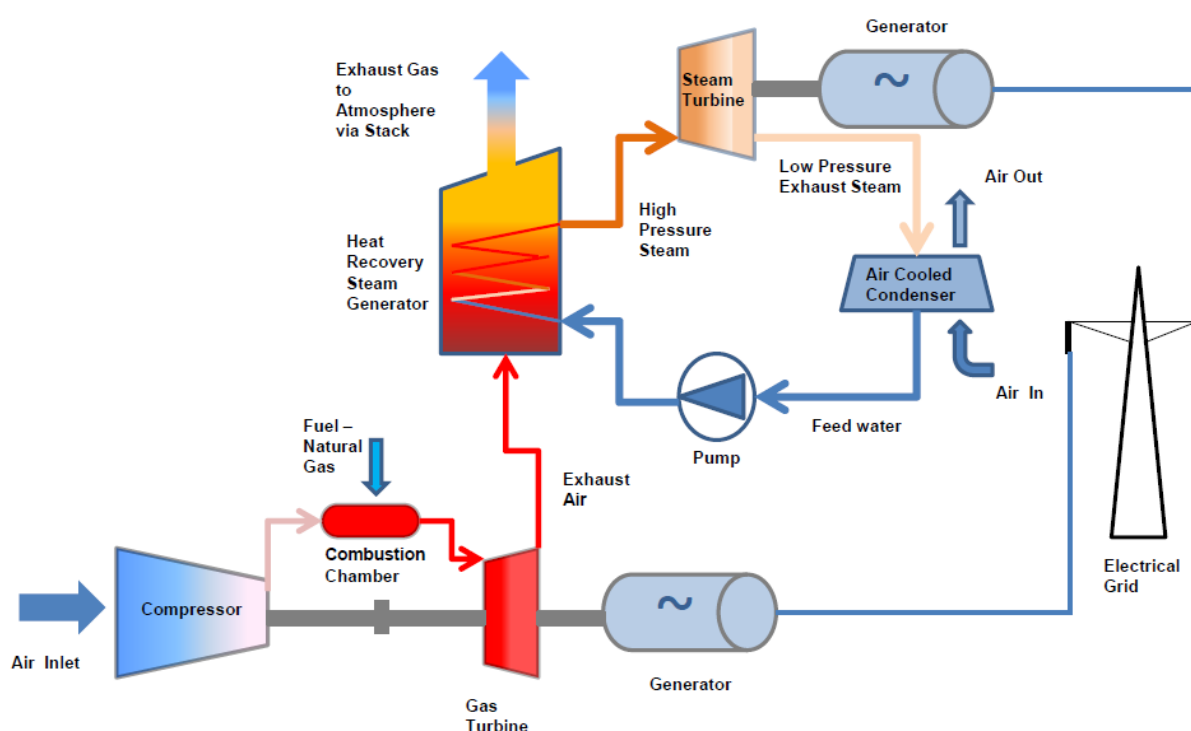


Figure 4: A typical schematic diagram of the generating plant proposed

- 3.8 The thermal efficiency of new CCGT plant, i.e. the proportion of the energy which is converted to electricity, is about 60%, based on the net calorific value of the gas fuel; this is higher than the efficiencies achieved by both existing and new coal-fired power stations. Natural gas has a higher hydrogen/carbon ratio than coal and the efficiency of the process means that carbon emissions in grams of CO₂ per kilowatt hour will be approximately 385 for the new plant, compared with approximately 900 for a conventional coal plant. Natural gas contains only negligible levels of sulphur and there are therefore negligible emissions of sulphur dioxide (SO₂) when burning gas.
- 3.9 A CCGT of nominally 1,200 MWe capacity would have a typical configuration of 2 separate turbine houses each containing a gas and steam turbine driving a common generator. The power station would require a cooling system to condense the exhaust steam from the steam turbine. It would also include an electricity sub-station on-site for the export of electricity to the grid. The sub-station could be one of two types – an air or a gas insulated sub-station (AIS or GIS). AIS switchgear occupies a larger footprint than GIS switchgear. In addition there would be smaller buildings for the station control room, offices, stores and water treatment plant. In total, the typical area occupied by a CCGT power station would be approximately 10 - 15 hectares.
- 3.10 The key building elements could be as follows:
- **turbine buildings** – typically 35 m wide, 65 m long, 25 to 30 m high
 - **HRSG buildings** – typically 25 m wide, 60 m long, 35 to 45 m high
 - **cooling system** – approximately 55 m square, 25 to 30 m high
 - **chimney stacks** – approximately 8 m in diameter and in the region of 60 to 90 m high

- **overhead power line** – upto approximately 47 m high, standard base footprint of between 7 m x 7 m and 16 m x 16 m, with a typical distance between towers of 360 – 450 m
 - **gas pipeline** – approximately 400 – 600 mm diameter, operating at a pressure to be determined during design development but not to exceed 85 bar pressure at a minimum depth of 1.1 m below ground level
- 3.11 The CCGT power station will require a cooling system to condense the exhaust steam from the steam turbine and the choice of technology will have to meet the 'BAT' (Best Available Technique) criteria required by the Pollution Prevention and Control (PPC) Regulations, under which the WEC will require a permit to operate. PPC is administered by the Environment Agency (EA) with whom WPL will enter into early discussions regarding the choice of technology for the site.
- 3.12 A number of cooling options have been considered including:
- **once-through cooling** – cooling water is abstracted continuously from a water source such as a river, passed through the steam condenser and discharged back to the water source at a higher temperature via an outfall pipe
 - **hybrid evaporative cooling** – cooling water is abstracted continuously from a water source as for once-through cooling, but is cooled and re-circulated rather than being continuously discharged
 - **air-cooling** – air cooled condensers are widely used for new-build CCGT plant. They avoid the need for large volumes of water abstraction and discharge
- 3.13 Initial studies indicate that air cooling is the most appropriate solution for the WEC. This will be confirmed with further study during the development of the design.

Design

- 3.14 The requirement to consider design is enshrined in the relevant legislation, with section 10(3)(b) of the Planning Act 2008 requiring the Secretary of State to have regard to the desirability of '*achieving good design*' in carrying out the functions of designating or reviewing NPS.
- 3.15 NPS EN-1 sets out criteria for good design for energy infrastructure, including at paragraphs 4.5.1 – 4.4.6 where it recognises that functional design is equally important to aesthetic design. Paragraph 4.5.1 states:
- Applying "good design" to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible. It is acknowledged, however that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area.*
- 3.16 In this context, and taking account of regulatory and other constraints, PINS will have to be satisfied that the proposed development is sufficiently sustainable with regard to:
- durability and adaptability (particularly with regard to flooding and climate change)

- functionality
 - aesthetics
 - siting relative to existing landscape character, landform and vegetation
 - sensitive use of materials
- 3.17 Applicants are required to demonstrate in their submission how the design process was conducted and how the proposed design has evolved.
- 3.18 Whilst the design of the proposed CCGT power station will evolve through the pre-application process, NPS EN-2 recognises at paragraph 2.6.5 that *'It is not possible to eliminate the visual effects associated with a fossil fuel generating station. Mitigation is therefore to reduce the visual intrusion of the buildings in the landscape and minimise impact on visual amenity as far as reasonably practicable'*.
- 3.19 NPS EN-2 continues to note that *'the precise architectural treatment will need to be site specific'* indicating that reduction of visual impact could involve:
- enclosing buildings at low level
 - earth bunds and mounds
 - tree planting
- 3.20 The design of the WEC will continue to evolve through the pre-application process to take account of all consultees' responses to the proposal.

Access

- 3.21 The WEC site is reached from Bryn Lane at the Wrexham Industrial Estate. The estate is well served by highways connections, including the recently opened Wrexham Industrial Estate Northern Access Road that connects Bryn Lane to the A534 and improvements to the southern access to the industrial estate.
- 3.22 The access arrangements for the construction, operation and maintenance of the gas and electrical connections will be identified as part of further technical study of the design and routing.

Electricity connection

- 3.23 The proposed power station will need to connect to National Grid's electricity network. The consideration of potential grid connections has taken account of the power output from the new station and the maximum capacity that can be exported from the site considering the capacity of the current or planned future National Grid infrastructure. Preliminary discussions have been held with National Grid to gather information on their current and planned investments into the electricity infrastructure in this region. Therefore the general options for the electricity grid connection have been considered in the first instance in order to broadly identify the connection route corridors.
- 3.24 The nearest National Grid connection point with sufficient capacity for the power station is at the Legacy substation at Talwrn, approximately 11 km to the west of Wrexham, on the B5605 between Rhosllanerchrugog and Rhostyllen.

- 3.25 Between the CCGT site and the Legacy substation, passing to the south of Wrexham, are the existing overhead lines for the 132 kV local distribution network. A connection to the Legacy substation therefore presents two potential options, as illustrated in Figure 5:
- connection to the Legacy substation via approximately 13 km of new 400 kV overhead lines. This "*northern corridor*" would take a more direct route to the substation; or
 - connection to the Legacy substation following the general alignment of the existing overhead power lines located in the "*southern corridor*"
- 3.26 Each of the route options would have common sections at the beginning and end of the route. From the power station site options to route the corridor through the industrial estate are being considered in addition to routing the initial section of power line to the east of the industrial estate.

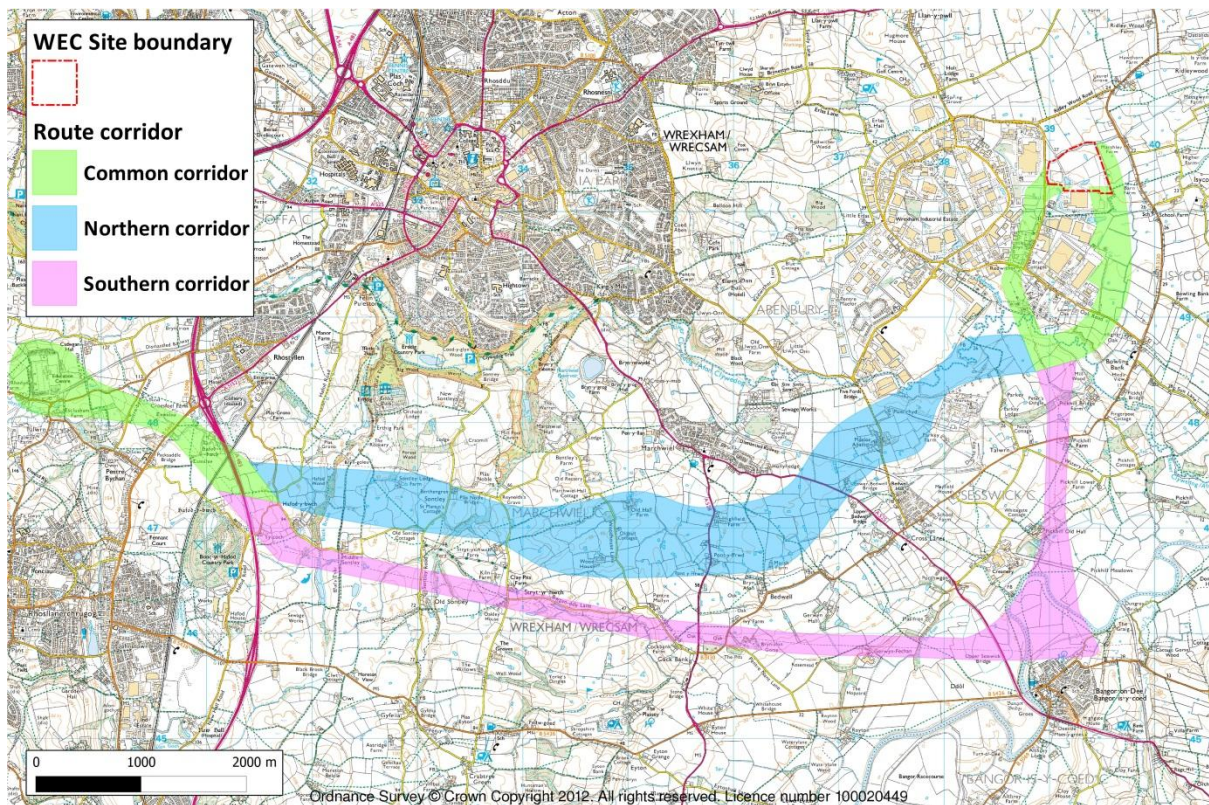


Figure 5: Indicative electrical connection route corridors – not to scale (© Crown copyright, license number 100024244 Savills (L&P) Limited)

- 3.27 Informal initial public consultation on the potential electrical connection route has been undertaken, as summarised in the WEC: Stage One Feedback Report. The responses to this consultation exercise suggest that the southern route option is generally preferred.
- 3.28 At this stage, the exact location of the grid connection has not been determined as this must take account of more detailed technical and environmental studies. These route corridors are indicative at this stage and do not allow for any additional land that may be required temporarily for construction. All land required for the delivery of the development proposals will be identified prior to undertaking the full EIA.

- 3.29 The land use in the route corridors is generally farmland with mature hedgerows and woodland. There appears to be the potential to align connections in such a way as to generally achieve a reasonable separation from residential properties. There are numerous small ponds and other potential habitats for notable and protected species. There is a potential for buried archaeology within the route corridors and many areas that would be sensitive to visual effects.
- 3.30 Some of the existing overhead infrastructure in the area crosses Wat's Dyke and Offa's Dyke, and passes to the south of Erddig Park, a National Trust property. There are also Scheduled Ancient Monuments and listed buildings in the route corridors.

Gas connection

- 3.31 The proposed power station will need to connect to National Grid's high pressure gas network, the National Transmission System (NTS). The consideration of gas connection has taken account of the demand of the new power station and maximum capacity and pressure available in the network in the Wrexham area. Preliminary discussions have been held with National Grid to gather information and discussions will be ongoing as design of the project evolves. The routing of the gas pipeline requires further consideration of various technical, environmental, socio-economic and cost factors.
- 3.32 The nearest NTS connection point is near Talwrn 3 km to the south of the site (not to be confused with Talwrn next to the Legacy sub-station). National Grid will provide a tapping for interconnection of the power station to the high pressure gas network and a Pressure Reducing Station for the supply and metering of gas to the gas turbines will be provided within the site.
- 3.33 There will be no storage of natural gas on the WEC site other than the relatively small volume of gas in the incoming pipeline and the pipe-work feeding gas to the gas turbines.
- 3.34 At present there are no plans for the provision of a backup fuel (normally light fuel oil) and therefore no large quantities of fuel oil will be stored in tanks at the site. This removes the risk of site ground contamination from fuel oil leaks during fuel transfer from transport vehicles or from fuel pipe-line or tank leaks.
- 3.35 The exact location of the gas pipeline connection has not been determined as this would need to be informed by more detailed technical and environmental studies as well as both the initial feedback received from the recent public consultation exercise and the further pre-application consultation that will be carried out.
- 3.36 Two potential route corridors have been identified within which the connection is likely to fall, as shown in Figure 6. The gas pipeline would pass south from the site and on the eastern side of the industrial estate, cross Oak Road and the River Clywedog to the B5130 in the south west. As with the grid connections, these route corridors are indicative at this stage and do not include land that would be required temporarily for construction. All land required for the delivery of the development proposals will be identified prior to undertaking the full EIA.

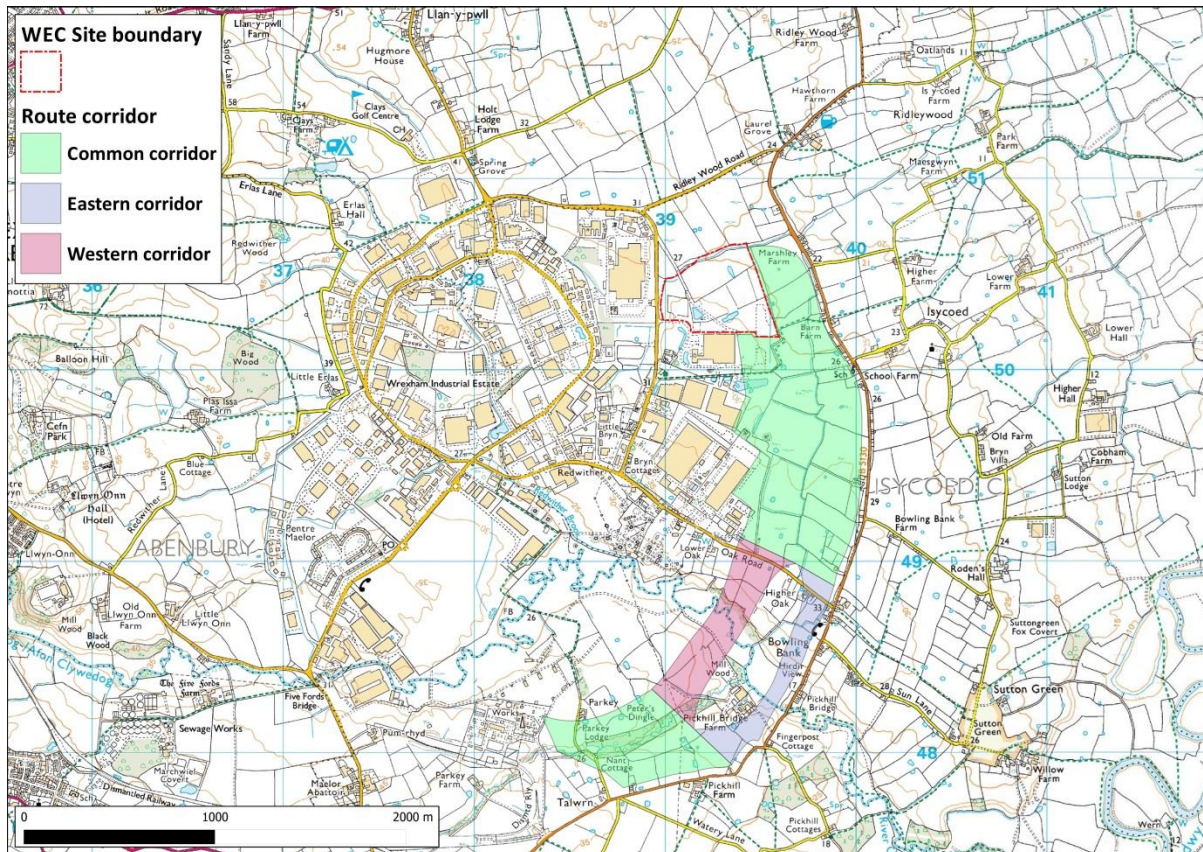


Figure 6: Indicative gas connection corridors – not to scale (© Crown copyright, license number 100024244 Savills (L&P) Limited)

- 3.37 The topography of the route corridor is generally flat and level and there are no significant engineering challenges such as major highway or rail crossings. The land use is generally farmland with mature hedgerows and woodland. It appears that it should be possible to locate a route that would minimise the loss of trees. There are numerous small ponds and other potential habitats for notable and protected species, and the construction of the pipeline will need to be carefully planned and managed to ensure that the potential effects on farms and ecology are minimised and adequately mitigated.

Combined heat and power

- 3.38 The Government's policy is that - from a fuel efficiency and climate change perspective - waste heat from large power stations should be utilised, where possible, for community heating and industrial uses. Guidance has been issued for developers to enable an assessment of such combined heat and power (CHP) opportunities. This guidance will be utilised for the proposed WECC development to ascertain whether CHP is viable.
- 3.39 An initial assessment of the potential to employ CHP at this site has been made with reference to the UK CHP Development Map, produced by the Department of Energy and Climate Change (DECC). The map shows that Wrexham Industrial Estate (WIE) has a sizable heat load, with the usage sector being predominantly small industrial facilities.

- 3.40 The infrastructure of the estate would also indicate that the installation of a district heating ring main to serve users might be feasible. An Energy Questionnaire has been prepared and circulated to occupiers on the WIE to determine how they use energy, and whether there are users which could benefit from waste heat from the power station.
- 3.41 Early indications on the feasibility of employing CHP at this site are therefore favourable but further study is required to confirm its technical and economic potential.
- 3.42 For the purposes of the EIA, it is assumed that the CCGT power plant will be CHP ready. The required infrastructure to allow for the future offtake of waste heat will be incorporated into the power station, but it is unlikely that district wide infrastructure outwith the power station site itself would be developed at the same time as the WEC. The EIA will therefore assess the potential effects of CHP insofar as they are relevant to the power station site and immediate surroundings.

Carbon capture readiness

- 3.43 The burning of fossil fuels such as coal and gas releases carbon dioxide, a greenhouse gas, into the atmosphere. The UK government is committed to encouraging the development of carbon capture and storage technology and is funding research and development projects in the UK. The Department of Energy and Climate Change (DECC) has published a guidance note that requires applications for new power stations of greater than 300 MWe output to demonstrate that they are CCR – this policy is repeated in NPS EN-1 at paragraph 4.7. At present the technology required to capture CO₂ at a large scale has not been developed to such a point that it can practically be deployed at new fossil fuelled power station. However, in anticipation of the maturing technology coming forward and in accordance with policy requirements, an area of land suitable for the location of carbon capture plant will be reserved adjacent to the proposed power station to enable the retrofit of this technology at a future date. The WEC site includes up to 4 hectares of land that could be needed for future carbon capture plant and equipment.
- 3.44 The policy also requires applicants to demonstrate that a suitable deep geological storage exists offshore and that it is technically and economically feasible to retrofit and operate the equipment in the future as well as to transport the captured carbon dioxide to the proposed storage area.
- 3.45 The guidance requires that power station applications show the potential route corridors of the carbon pipelines and advises that the corridors considered should be 1 km wide for the first 10 km and then 10 km wide thereafter.
- 3.46 Three potential carbon pipeline routes from the WEC site have been provisionally identified at this early stage in the development of the proposals. These would pass in a north westerly direction towards the Irish Sea. Further details would be included within the DCO application.

Construction

Wrexham Energy Centre construction programme

- 3.47 The proposed power station would have a construction programme of approximately 3 to 4 years, including a preliminary design and site establishment stage of about 6 to 12 months. The site programme would typically comprise preliminary works, civil works, and erection, commissioning and handover phases.
- 3.48 The area of land required by the contractor for construction of the CCGT power station would, where practicable, be made available entirely from within the WEC site, or on land surrounding the power station site. Within the route corridors for the gas and electricity grid connections, the land required for construction has not been identified at this stage - this will be determined prior to submission of the DCO application and will take account of relevant environmental issues such as noise nuisance, the potential for buried archaeology and sensitive ecological aspects, visual effects, traffic etc.
- 3.49 The preliminary works stage would include the clearance and preparation of contractors' areas and the installation of services including access roads within the site, utilities supplies and drainage. The duration of this phase would be approximately six months and would include the early ecological mitigation measures, followed by removal of redundant below ground structures/services associated with the site's previous use and the implementation of a contaminated land remediation strategy required before the main construction work commences.
- 3.50 The piling and main foundation construction would take approximately 12 months to complete. Erection of above ground structures and installation of the power plant would then commence. The earliest date that the first unit of the new power station could be in commercial operation would be approximately 30 to 36 months following the award of the main construction contract, although this date would depend on the specific CCGT technology chosen.
- 3.51 With 2 CCGT units to be constructed, the construction and commissioning of successive units would be phased to make the best use of construction labour and equipment.

Wrexham Energy Centre construction materials and design

- 3.52 The quantities of construction materials will be estimated because the plant will not be fully specified and designed until after consent has been received. However, the various materials can be robustly assessed so that they can be included in the transport assessment and in an assessment of resource consumption. The main construction components are -
- concrete
 - structural steel
 - mechanical and electrical plant
 - other construction materials
 - bulk fill

- 3.53 A range of other materials would be required, including kerbstones, brickwork, block-work, sheet cladding, gullies and drainage pipe work, paint, doors and windows. The technical design of the power station layout and the architectural design of the buildings will take account of environmental aspects such as the layout of the site so as to minimise potential effects on ecological receptors on site, the need for noise insulation within the main CCGT plant buildings and the layout, form and colour of buildings to address potential landscape and visual effects.

Wrexham Energy Centre construction plant and laydown

- 3.54 The area of land required by the contractor for construction of the CCGT power station would, where practicable, be made available entirely from within the WEC site, or on land surrounding the power station site. For the gas and electricity routes suitable laydown areas will be identified following detailed route assessment with these areas included in the assessment of environmental effects.
- Some earthmoving is anticipated, and therefore earth shifting plant would be required.
 - There would also be excavation works and therefore excavators and dump trucks would be required.
 - There would be some new road construction within the site requiring bulldozers, scrapers, pavers, etc.
 - It is anticipated that concrete mixing would not be carried out on site.
 - Structural steel erection would call for a number of cranes, as would a wide variety of other activities.
 - There would be a need for a large amount of miscellaneous attendant plant.
 - Should piled foundations be required, piling rigs would be needed.
 - At this stage it is not known whether cast-in place piles or driven piles would be used. Larger excavations would need to be supported by sheet piles, which would need to be driven.

Gas connection construction and maintenance

- 3.55 The gas pipeline that will connect the power station to the NTS from an offtake at Talwrn will be an underground pipeline. The pipeline will be designed and installed in accordance with the Pipelines Safety Regulations 1996, the HSE's guidance '*A guide to the Pipelines Safety Regulations 1996*' and the HSC's '*Approved Code of Practice and Guidance Design, construction and installation of gas service pipes*'.
- 3.56 The depth and route of the pipeline will be determined by topography, physical constraints such as roads, railways, water courses and property as well as key environmental constraints, but will be to a minimum depth of 1.1 m. The Institution of Gas Engineers and Managers (IGEM) have published a series of guidance documents (the IGE/TD series) which includes guidance on the depth of gas pipelines for safeguarding against the risk of third party damage.
- 3.57 No significant engineering problems have been identified at this stage, with the River Clywedog probably being traversed using directional drilling techniques. Crossing of the B5130 and Oak Road are minor road crossings in pipeline construction terms. There is good road access to the likely offtake site.

- 3.58 The working width for construction is typically 30 to 40 m, though this may increase where there are physical constraints. Preparation for construction will entail soil stripping, land drainage works and securing of the working areas, including any environmental mitigation and management works associated with these activities. Construction of the gas pipeline will then entail the following activities and equipment:
- excavation and backfill plant
 - pipeline installation plant
 - welding and non-destructive testing
 - supply and installation of a cathodic protection system
 - horizontal directional drilling under roads, rail and waterways
 - reinstatement of land drainage
 - reinstatement of land at open cuts
 - import of sand or other backfill materials
 - construction of offtake and pressure reduction station
 - hydrostatic testing
 - commissioning
 - telemetry and control system installation and commissioning
- 3.59 Operation and maintenance of the gas connection will be in accordance with the legal requirements of the Pipeline Safety Regulations and the guidance published by the HSE and IGEM. This will entail a combination of visual inspection, internal inspection of the pipeline by pigging and cathodic protection monitoring.

Electrical connection construction and maintenance

- 3.60 The connection of the WEC to the National Grid substation at Legacy and the potential for the provision of a supply to the local substation at the Wrexham Industrial Estate will be via an overhead line, though at this stage undergrounding of the electrical connection at key constraints has not been ruled out and will be considered as part of the ongoing routing studies.
- 3.61 There are three main types of lattice steel tower pylon that will be constructed. These are:
- suspension towers which support the conductors on straight stretches of line
 - deviation towers at points where the route changes direction
 - terminal towers where lines terminate at substations or are connected to underground cables.
- 3.62 Construction commences with preparation of the working area for the pylon bases. This may require some minor works to public highways for improved access or the construction of new temporary accesses. This will also require temporary trackways across agricultural land that would require reinstatement on completion of construction. These details will be developed through the design process and pre-application consultations, including with land owners or occupiers.

- 3.63 As with the gas pipeline, preparation for construction of the pylon bases will entail soil stripping, land drainage works and securing of the working areas, including any environmental mitigation and management works associated with these activities.
- 3.64 The final size and depth of the pylon bases will be determined by the ground engineering conditions at the specific sites. The pylon bases will be formed of concrete imported to the construction site along with the steelwork to form the pylon structure. The pylon will be assembled and erected using a mobile crane. The overhead lines are installed by using pilot wire passing from a pulling site at one end and a tensioning site at the other.
- 3.65 Maintenance of the overhead lines is by visual inspection. Typical maintenance entails protective coating of the steelwork and clearance works to ensure the pylons and overhead lines are free from obstruction. The pylons typically have a lifetime of 80 years and the lines will require repair and refurbishment during this lifetime. Repair and refurbishment work will usually involve the use of temporary access, scaffolding and plant/equipment with reinstatement of any disturbance to the ground on completion.

Construction transport

- 3.66 The detailed scope of the construction transportation assessment will be agreed with the relevant local authority highway departments and is likely to include:
- a description of the local highway network and its current capacity
 - a review of the existing transport assessment, which has taken into account the operation of the consented B2/B8 development on the WEC site, and its applicability to the project
 - a baseline assessment of the construction access route, its capacity and existing traffic flows (including site specific traffic counts)
 - an abnormal load route report and management plan. It is proposed that all abnormal loads and HGVs will be routed to avoid villages
 - an investigation of and allowance (as appropriate) for other consented developments
 - an evaluation of the transportation effects and in particular, construction traffic and abnormal loads
 - proposals for traffic management plans for both construction HGV traffic and construction workers traffic (investigating a “*park and ride*” scheme for construction workers if required)
 - consideration of cumulative effects associated with other developments
 - consideration of traffic related air quality issues
 - consideration of traffic related noise and vibration issues

Utilities

- 3.67 During the construction of both the WEC and its grid connections there is the potential for disruption to existing local utilities, such as water and electricity supply. Locations of the utilities will be identified and an assessment of the potential effects undertaken.

Decommissioning and demolition

- 3.68 A CCGT power station typically has a design life of 35 years. Elements of the plant and its gas and electricity grid connection infrastructure may need to be replaced as a part of ongoing maintenance to ensure it works at its optimum capacity, and this can also serve to extend the lifetime of the plant. At the end of its life, the CCGT plant and infrastructure will be decommissioned with all structures on the site demolished with the slab foundations removed to a depth of 2 m.
- 3.69 It will be a requirement of the Environmental Permit that the land quality condition at the end of the power station's life is no worse than at commencement of operation, and the site would therefore be made suitable for a future commercial / industrial land-use from a land quality perspective.
- 3.70 Decommissioning and demolition will require many of the same aspects as seen during construction, such as the establishment of works compounds on site and the use of demolition plant and equipment. The activity will entail the recovery of scrap metal, the breaking-out excavation and crushing of concrete for re-use, the safe treatment and/or disposal of liquid effluents and the transportation of materials from site.

4. Alternatives and scheme evolution

Introduction

- 4.1 This section provides an overview of the strategic options that have been considered, and those that will be considered further, in the development of the proposals for a CCGT generation station at the WEC site. It includes an outline of the process undertaken to develop options for the configuration of the power station, the site location and layout, and the route corridors for the gas and electricity connections. These initial options were developed to inform the informal consultation on the proposals and will be developed further through the EIA process.

Approach

- 4.2 A project promoter is required to include information in its ES about the alternatives to the development that it has considered. Options appraisal is used to compare project options and to assess the positive and negative effects they may have across a range of criteria including environmental, technical, socio-economic and cost factors.
- 4.3 A review of development options is of value as it assists a developer to identify appropriate technical options and to select a site or sites appropriate for its needs. From an EIA perspective, consideration of alternatives helps the decision-maker to determine whether a proposed site is acceptable, or whether less harmful alternatives are available. In planning terms there can be specific requirements to consider the availability of alternatives where, for example, protected landscapes are affected by a development proposal.
- 4.4 At both a strategic and local level WPL has considered a number of criteria and options, including:
- the role of gas as part of the national electricity generation mix, the technology options for gas fired power stations and the selection of CCGT as the preferred technology
 - the basic elements of a CCGT power station, the gas and electricity grid connection requirements and the extent of land needed for the development
 - the national and local search for sites, the consideration of sites in the Wrexham locality and the selection of a site at the Wrexham Industrial Estate
 - the location of the power station within the land, the planning and environmental considerations and the options for the technical and spatial configuration of the CCGT
 - the route corridor options for the gas connection
 - the route corridor options for the electricity connection
 - consideration of the carbon capture and storage requirements

Electricity generating options

- 4.5 Electricity can be generated from a range of sources – gas, coal, oil, nuclear and various renewable energy sources including wind, solar and hydro power. The policy position with regard to the important contribution made by gas fired generation is explained in paras. 3.6.1 to 3.6.2 of NPS EN-1, as follows.

3.6.1 Fossil fuel power stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix. They will continue to play an important role in our energy mix as the UK makes the transition to a low carbon economy, and Government policy is that they must be constructed, and operate, in line with increasingly demanding climate change goals.

3.6.2 Fossil fuel generating stations contribute to security of energy supply by using fuel from a variety of suppliers and operating flexibly. Gas will continue to play an important role in the electricity sector – providing vital flexibility to support an increasing amount of low-carbon generation and to maintain security of supply.

The selection of CCGT technology

- 4.6 Modern gas-fired power stations can be based on a number of gas turbine technologies. Technology selection takes account of a range of factors:
- technical/engineering issues
 - materials in and out
 - environmental impact
 - best available technology (BAT) for emissions clean-up
 - overall performance characteristics
 - planning issues
 - layout area
 - build programme
 - economics
- 4.7 Open cycle gas turbine (OCGT) technology has a single gas turbine and offers moderate electrical efficiency. CCGT technology incorporates both a gas and a steam turbine, creating additional electrical power and, with the advances in CCGT technology in recent years, their electrical efficiency is increased.
- 4.8 A CCGT power station utilises an efficient combination of gas and steam turbines to generate electricity and heat.

Operational considerations

- 4.9 In selecting a suitable site for a new CCGT power station, the following factors must be considered:
- sufficient space is needed to install, access, operate and maintain the facility in a safe and economic manner
 - a suitable source of gas is required that can be delivered to the site economically
 - either a local consumer for the electricity generated, and / or the ability to economically export the electricity to the National Grid
 - a suitable medium (air and / or water) to provide cooling to the steam turbine exhaust steam condenser and for all other auxiliary cooling requirements
 - a suitable source of water for the boilers and for all other auxiliary requirements
 - surface water run-off can be discharged to a local watercourse or to sewer
 - all other liquid effluents can be discharged to a suitable sewer or treated on-site
 - the ground conditions are suitable for the installation of the civil structures and major plant items
 - the effects of the construction and operation of the facility on humans and the environment from emissions to air, land and water including nuisance can be adequately mitigated
 - all necessary permits and licences are in place or can be obtained

Site selection

Strategic site location

- 4.10 WPL has undertaken a strategic search for potential power station sites in the UK, using a phased methodology. Search criteria included the availability of connections to the NTS for gas supply, and connections to the National Grid for the export of electricity. The future availability of options for the export and storage of carbon dioxide is a further locational consideration.
- 4.11 There are relatively few places in the UK where these three over-arching requirements – gas supply, electricity export and potential future carbon export – coincide. One of those places is the Wrexham area.
- 4.12 The next stage of the site selection process involved finding a suitable site which is available and which has the potential to achieve the physical links to the identified connection points on the gas and electricity networks. To do this, it was necessary to define a basic site requirement. This is summarised as:
- a broadly level and contiguous site of c. 20 hectares, with
 - undeveloped corridors of land leading to the gas and electricity grid connection points, and
 - road access suitable for construction and operational traffic

- avoiding areas of designated landscape, natural or heritage interest and land in flood risk areas, and with the potential to supply surplus heat to land uses neighbouring the site
 - in locations suitably separated from housing and other sensitive land uses such as schools
 - ideally on previously developed or '*brownfield*' land, and/or land allocated for industrial use
 - owned by a landowner prepared to lease or sell to WPL on commercial terms
- 4.13 WPL has undertaken a broad search for sites in the Wrexham area that meet these criteria. In summary, the outcome of this search thus far has been that:
- no suitable sites are available within the urban area of Wrexham itself
 - areas to the west, south and north of Wrexham are constrained by the undulating terrain and a landscape characterised by well-defined small fields with wooded boundaries
 - areas to the north of Wrexham are similarly constrained, and are considered to be too remote from the gas and electricity grid connection points
 - several site options meeting many of the criteria listed above have been considered at the Wrexham Industrial Estate, a large industrial complex on the eastern side of Wrexham

Wrexham Energy Centre site selection

- 4.14 WPL proceeded to consider three sites for further evaluation. These are:
- the former Firestone factory site at Pentre Maelor on the southern side of the WIE
 - Kingmoor Park South – including the former Owens Corning fibre-glass factory site on the north-eastern side of the WIE and open land immediately to the north
 - Kingmoor Park North - land to the north of the Owens Corning site off Bryn Lane (*'the north site'*), which is being promoted by the owner for industrial development
- 4.15 Each of these sites is considered to be capable, physically, of accommodating a power station and the associated area that needs to be reserved for potential future carbon capture. Each has suitable road access and open corridors of land to the preferred gas and electricity grid connection points. They were all therefore taken forward for consideration during the preliminary informal consultation, with WPL's preferred site being Kingmoor Park South.
- 4.16 Following assessment and preliminary informal consultation, WPL has decided to promote the Kingmoor Park South site for the proposed CCGT development. With respect to the site selection criteria identified above, the site:
- is within the WIE boundary, is allocated for development and has an extant planning permission for major industrial development;
 - is a broadly level site with sufficient room for all operational requirements and for a generous boundary landscape treatment;
 - it has undeveloped corridors of land leading to the gas and electricity grid connection points;

- road access is suitable for construction and operational traffic, and has been improved through the construction of the new Wrexham Industrial Estate Access Roads;
 - the site avoids areas of designated landscape, natural or heritage interest and land in flood risk areas;
 - it affords the potential to supply surplus heat, and potentially gas and electricity to some of the larger existing occupiers on the industrial estate;
 - neighbouring industrial land uses are compatible with a modern CCGT development, and site is, as noted, suitably separated from dense housing and other sensitive land uses such as schools;
 - the site is partly brownfield and partly greenfield and has an existing planning permission for a large scale industrial use on a similar footprint to a power station;
 - the landowner is prepared to make the site available.
- 4.17 Detailed assessment of the site selection process will be provided as part of the EIA process and summarised in the ES taking account of the considerations outlined below.

Power station design options

CCGT location within the site

- 4.18 The Kingmoor Park South site is relatively large and would allow for a variety of power station layout and orientation options. A number of technical, planning and environmental factors have been considered in identifying options for the location and layout of the CCGT within the site. It has been decided that the focus of attention should be a location in the south-western part of the broader area of land under review. This conclusion was based on a combination of reasons:
- The southern and western part of the site is adjacent to the existing industrial estate where the character of the site is more urban and industrial. The remainder of the site becomes progressively more rural in character to the north and the east.
 - The south-western location would afford the greatest separation from the nearest residential properties to the north and east. This would reduce the potential for nuisance such as noise and visual effects.
 - The southern part of the site has been previously developed for industrial use and as such is brownfield land. The remainder of the site is greenfield and is used as farmland.
 - Connections to the gas and electricity grid are to the south of the site and therefore a southern location would minimise the length of these route corridors.
 - Neighbouring land uses that might be customers for heat generated by the WEC lie to the south and west of the site.

Technical options for the configuration of the CCGT

- 4.19 The principal technical considerations for the development of options for the CCGT are:
- the performance of different configurations versus the relative costs;
 - water supply and technology options for the cooling system;
 - general technical criteria for layout of the CCGT plant.
- 4.20 The performance of a number of different configurations is being considered in terms of electrical output, thermal efficiency and heat rate (i.e. fuel input per unit electrical output) based on configurations for a number of UK technology suppliers (companies such as Siemens, GE, Mitsubishi and Alstom). This data is being compared to the relative capital and unit costs to provide an understanding of economic performance of the options.
- 4.21 The cooling options which have been considered include the following.
- **Once-through cooling** – cooling water is abstracted continuously from a water source such as a river, passed through the steam condenser and discharged back to the water source at a higher temperature via an outfall pipe. However, the volume of water required for this application is significant and generally only suitable for coastal or estuary locations.
 - **Hybrid evaporative cooling** – cooling water is abstracted continuously from a water source as for once-through cooling, but is cooled and re-circulated rather than being continuously discharged. Hybrid systems are used for new-build CCGT plant and incorporate a wet and a dry section to avoid visible water vapour being released. Whereas these use less water than once-through cooling, and therefore the environmental effects of abstraction are reduced, they still require continued abstraction and discharge.
 - **Air-cooling** – air cooled condensers are widely used for new-build CCGT plant. They avoid the need for large water abstraction and discharge, although they are less efficient than water cooled systems, and the relative costs and performance of air cooled condenser plants often makes them less attractive than water cooled plants.
- 4.22 Due to the lack of a suitable source of water and the adverse environmental effects associated with the abstraction and discharge of water for the once-through cooling option, hybrid evaporative cooling and air cooled condensers are under consideration for the proposed WEC.
- 4.23 The general technical criteria that will determine the layout options for the CCGT facility include the following:
- the air intakes to the gas turbine should be sheltered from the prevailing wind to minimise the risk of rain, snow or foreign objects being entrained in the intake causing damage;
 - the air cooled condenser should be located downwind of the gas turbine air intake to prevent warm air being drawn into the air compressor and affecting its performance;
 - access to the site would be in the south-west from Bryn Lane which forms the western boundary of the site.

Combined heat and power

- 4.24 An initial assessment of the potential to employ CHP at this site has been made with reference to the UK CHP Development Map, produced by DECC. The map shows that Wrexham Industrial Estate has a sizable heat load, with the usage sector being predominantly small industrial facilities.
- 4.25 The infrastructure of the estate would also indicate that the installation of a district heating ring main to serve users might be feasible.
- 4.26 Early indications on the feasibility of employing CHP at this site are therefore favourable but further study will be carried out to confirm its technical and economic potential.

Environmental considerations

- 4.27 Initial environmental information on the setting of the Wrexham Industrial Estate and the likely environmental aspects of the operation of a gas power station has been gathered. This information will be further developed through more detailed surveys and studies as the design of the proposals is developed and will be reported in the PEI and ES in due course.
- 4.28 The environmental aspects considered have included the following:
- air quality
 - noise
 - ecology
 - landscape
 - cultural heritage and archaeology
 - flood risk
 - land contamination
- 4.29 Various environmental sensitivities have been identified including the landscape, ecological and noise effects of the project. It is considered that it should be possible to arrive at an acceptable form of development through a design that responds proactively to the identified issues.

Gas connection

- 4.30 At this stage, the exact location of the gas pipeline connection has not been determined as this would need to be informed by more detailed technical and environmental studies and associated consultation. Potential route corridors have been identified within which the connection is likely to fall as detailed in Figure 6.
- 4.31 No clear overall preference regarding the routing of the gas pipeline has emerged from the preliminary consultation exercise. The final routing of the pipeline will therefore be dependent on detailed engineering and environmental assessment.

- 4.32 Both of the route corridors will, therefore, be considered as part of the EIA process, and environmentally assessed to the extent required.

Electricity grid connection

- 4.33 Preliminary discussions have been held with National Grid to gather information on its current and planned investments into the electricity infrastructure in this region. Whether the connections are overhead lines or underground cables has complex technical, cost and environmental considerations. The general options for such grid connections have been considered in the first instance in order to broadly identify the connection route corridors.
- 4.34 As shown in Figure 5, potential route corridors have been identified. Preliminary informal consultation suggests, at this stage, that the southern route option would be the most favoured. Further technical assessment of the route corridor together with routing options will be assessed as part of the EIA process and reported on within the ES.

Carbon capture and storage

- 4.35 DECC has published a guidance note that requires applications for new power stations of greater than 300 MWe output to demonstrate that they are CCR. The guidance requires applicants to demonstrate that:
- there is sufficient space on or near the site to accommodate carbon capture equipment
 - a suitable deep geological storage exists offshore
 - it is technically and economically feasible to retrofit and operate the equipment in the future, and to transport the capture carbon dioxide to the proposed storage area
- 4.36 The guidance requires that applications show the potential route corridors of the carbon pipelines and advises that the corridors considered should be 1 km wide for the first 10 km and then 10 km wide thereafter.
- 4.37 Three potential carbon pipeline routes from the Wrexham Industrial Estate have been identified. These would pass in a north westerly direction towards the Irish Sea.

Conclusions

- 4.38 WPL has undertaken a review of development options that embraces site selection, consideration of alternative route corridors for gas and electricity connections and potential future carbon export, the potential to supply energy and / or heat to neighbouring land uses, and design and layout options for the power station itself.

5. Summary and proposed structure of the ES

Summary

- 5.1 Section five of this scoping report sets out the scope of the proposed EIA, with the proposed structure of the ES set out in this chapter. The EIA topics are considered to address all areas where significant environmental effects could occur with no topics considered insignificant and '*scoped out*'.
- 5.2 The topics proposed for the ES are:
- air quality
 - ground conditions
 - the water environment (including flood risk)
 - ecology
 - landscape and visual
 - noise and vibration
 - transport and traffic
 - socio-economics
 - cultural heritage
 - health, safety and security
 - waste
 - agriculture
- 5.3 Consultees are invited to comment on the proposed scope of the EIA set out in this report. The main questions to consider when reviewing the environmental issues include as follows:
- Are there any potential significant topics and / or impacts that have not been included?
 - Is the intended method of assessment appropriate?
 - Are there additional mitigation measures that should be considered?
- 5.4 Responses to this scoping report should be sent to PINS directly with a copy also sent to WPL at the addresses below.

**The Planning Inspectorate
Temple Quay House
Temple Quay
Bristol
BS1 6PN**

**Wrexham Energy Centre
Local Dialogue LLP
FREEPOST NAT 3717
London
SE1 2BR**

Proposed structure of the ES

- 5.5 The findings of the EIA will be presented in an environmental statement that will comprise of a series of volumes. These will be:
- **Volume 1:** Environmental statement – non-technical summary (ES-NTS)
 - a short overview of the ES written in non-technical terms intended for a wide readership
 - **Volume 2:** Main written statement
 - setting out the findings of the EIA process, potential effects, mitigation measures, and residual effects resulting from the development
 - **Volume 3:** Figures
 - figures to accompany relevant chapters where necessary
 - **Volume 4:** Appendices
 - additional information to accompany chapters where necessary
- 5.6 It is proposed that the WEC CCGT site, overhead power line and gas pipeline are each considered together within the ES chapters. Reference to each element of the scheme will be clearly separated in the ES for clarity and consistency.
- 5.7 The ES will be separated into chapters as outlined below:
- **Chapter 1:** Introduction
 - **Chapter 2:** The proposed development
 - **Chapter 3:** Planning and legislative context
 - **Chapter 4:** Alternatives and scheme evolution
 - **Chapter 5:** The scope of the EIA and overall methodology
 - **Chapter 6:** Transport and traffic
 - **Chapter 7:** Air Quality
 - **Chapter 8:** Noise and vibration
 - **Chapter 9:** Ecology
 - **Chapter 10:** Landscape and visual effects
 - **Chapter 11:** Cultural Heritage
 - **Chapter 12:** Socio-economic effects
 - **Chapter 13:** Land use and agriculture
 - **Chapter 14:** Health, safety and security
 - **Chapter 15:** The water environment
 - **Chapter 16:** Ground conditions
 - **Chapter 17:** Waste
 - **Chapter 18:** Conclusions

- 5.8 Chapters six to sixteen of the ES will follow a standard format under the following main headings:
- Introduction
 - Assessment methodology
 - Baseline information
 - Potential effects
 - Mitigation measures
 - Residual effects
 - Conclusion
- 5.9 WPL will evaluate alternative layouts and infrastructure routes in more detail, informed by the EIA process, and will summarise these in the ES.

6. Scope of the environmental impact assessment

Consultation

- 6.1 The Planning Act 2008 and the associated secondary legislation set out comprehensive provisions for consultation with relevant parties prior to submission of a DCO application.
- 6.2 In addition to consultation with the public WPL will consult with relevant local authorities, other 'statutory consultees' and persons with an interest in land that is affected by the proposed development.
- 6.3 The 'statutory consultees' are set out in the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended). WPL may also consult with other 'non-prescribed' bodies as appropriate. Those statutory consultees who will be consulted are detailed at Appendix 1 of this Scoping Report.
- 6.4 The output from formal (i.e. statutory) consultation that WPL will undertake under Sections 42 and 47 of the Planning Act 2008 will be summarised in a consultation report, which will be submitted with the DCO application.

Air quality

Introduction

- 6.5 This section presents the proposed approach to the air quality assessment for the Project. The scoping assessment for air quality has included:
 - examination of baseline conditions; this includes collating information on measured ambient concentrations in the vicinity of the development, a comparison with relevant air quality criteria, identifying Air Quality Management Areas (AQMAs) and sensitive receptors including designated ecological sites
 - consideration of air quality effects during the construction and operational phases
 - recommendations for mitigation to prevent, reduce or minimise potentially significant effects identified by the assessment
 - recommendations for the next stage of assessment
- 6.6 No consultation has been undertaken with the local authority at this stage; baseline air quality has been considered with reference to information in the public domain.
- 6.7 NPS EN-1 contains guidance on information regarding air quality effect which should be included in the ES at paragraph 5.2.7. This requires the ES to describe:
 - 'any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project

- the predicted absolute emission levels of the proposed project, after mitigation methods have been applied
- existing air quality levels and the relative change in air quality from existing levels; and
- any potential eutrophication impacts'

Study area

- 6.8 The study area for air quality will be defined through detailed air dispersion modelling, taking account of meteorological conditions to predict the emission concentrations with distance from the power station site, and then identifying sensitive human receptors that fall within this zone of influence. This detailed dispersion modelling has not been undertaken at this stage.
- 6.9 For nuisance issues such as construction dust, the study area will identify the nearest sensitive receptor to the source generally within 500 m of the power station site boundary and 500 m either side of the grid connection corridors. For air quality associated with traffic emissions, the study area will be defined on the basis of changes in traffic (volume, flows, speeds, vehicle type) as determined by the Transport Assessment. For potential air quality effects on European designated ecological sites, the study area is a 10 km radius from the power station site for Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar sites, and a 2 km radius for Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs), Local Nature Reserves (LNRs) and ancient woodland (AWI), as well as non-statutory local wildlife sites (LWS).

Existing information

Air pollutants

- 6.10 The air pollutant of primary relevance in the context of this assessment is nitrogen dioxide (NO₂) formed from the oxides of nitrogen discharged from the gas turbines. The gas turbines will also emit minor amounts of carbon monoxide (CO) and the trace quantities of non-methane volatile organic compounds and particulates are likely to be very low (<1%) against national standards and benchmarks, and therefore invariably will not cause significant environmental effects.
- 6.11 Road traffic associated with the development will emit nitrogen dioxide and fine particles known as PM₁₀ and PM_{2.5}. Background concentrations of these pollutants may already be present at concentrations close to or above their statutory limit values in some areas of the UK, and hence will also be the subject of the assessment for the proposed CCGT project.
- 6.12 In addition, dust may be generated during construction of the power plant and the associated gas pipeline and electrical transmission network.

Air quality criteria

- 6.13 Mandatory legislative air quality criteria are set in EU Directives that are implemented nationally by The Air Quality Standards Regulations 2010. The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, and Air Quality (Amendment) (Wales) Regulations 2002.

- 6.14 Further details of the EU Directive limit values and national air quality strategy (AQS) objectives are given below and the local air quality criteria that are relevant to this assessment are summarised in Table 1.

Table 1: National and European air quality criteria

Pollutant	Criteria	Compliance Date	
		AQS Objectives	EU Limit Values
NO ₂	Hourly average concentration should not exceed 200 µg/m ³ more than 18 times a year	31 December 2005	1 January 2010
	Annual mean concentration should not exceed 40 µg/m ³	31 December 2005	1 January 2010
PM ₁₀	24-hour mean concentration should not exceed 50 µg/m ³ more than 35 times a year	31 December 2004	1 January 2005
	Annual mean concentration should not exceed 40 µg/m ³	31 December 2004	1 January 2005
PM _{2.5}	UK (except Scotland): annual mean concentration should not exceed 25 µg/m ³	2020	-
	EU Stage 1 Limit Value: annual mean concentration should not exceed 25 µg/m ³	-	1 January 2015
	EU Stage 2 Limit Value: annual mean concentration* should not exceed 20 µg/m ³	-	1 January 2020
	Exposure Reduction: UK urban areas: target of 15% reduction in concentrations at urban background	Between 2010 and 2020	-
	Exposure Reduction: Target of 20% reduction	-	Between 2010 and 2020
CO	Maximum daily 8-hour average concentration should not exceed 10,000 µg/m ³	31 December 2003	1 January 2005

Notes: * indicative EU Limit Value to be reviewed in 2013

Ecological limit values

- 6.15 The EU has set limit values for the protection of vegetation for NO_x based on the work of the United Nations Economic Commission for Europe (UNECE) and World Health Organisation (WHO). These limit values have been incorporated into the Air Quality Limit Value Regulations 2001.
- 6.16 The limit value for NO_x for the protection of vegetation is 30 µg/m³ for the annual mean. This is the same as the AQS objective. The limit values for the protection of vegetation apply to locations more than 20 km from towns with more than 250,000

inhabitants or more than 5 km from other built-up areas, industrial installations or motorways. As monitoring sites need to be representative of an area of 1,000 km², the limit does not have a statutory basis in micro-scale environments such as those close to a road.

- 6.17 The Statutory Nature Conservation Agencies' (Natural England and the Countryside Council for Wales) policy is to apply the 30 µg/m³ criterion as a benchmark, on a precautionary basis, in internationally designated conservation sites and SSSIs.
- 6.18 In addition, critical loads for nitrogen deposition have been set that represent (according to current knowledge) the exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem.

Dust

- 6.19 There are no statutory quantitative controls or limits on general dust emissions from construction sites. Dust levels that are substantially elevated above the norm can cause annoyance. This commonly relates to increased rates of dust deposition on exposed surfaces and / or soiling (discolouration / contamination), although less commonly the term may relate to levels that are "*prejudicial to health*", including airborne dust.

The role of planning in air quality management

- 6.20 Paragraph 5.2 of NPS EN-1 deals with air emissions and requires that where the project may have an adverse effect on air quality, an assessment must be undertaken of the effects of significant air emissions including road traffic by determining the absolute level of emissions, the relative change in air quality and potential eutrophication effects.
- 6.21 NPS EN-2 deals specifically with fossil fuel electricity generating stations. Section 2.5 sets out matters relating to carbon emissions and oxides of nitrogen and sulphur as potentially significant effects to be considered within the EIA.
- 6.22 The planning guidance of general relevance for air quality is found within Planning Policy Wales. This states that air quality is a material consideration where there is a potential for a contribution towards EU limit values or national objectives for pollutants, taking into account the presence of AQMA's and the cumulative effects on air quality from individual sites in local areas. Planning decisions should ensure that any new development in AQMA's is consistent with the local air quality action plan.

Local air quality review and assessment

- 6.23 All local authorities are required by Part IV of the Environment Act 1995 to review air quality in their area and to assess present and likely future air quality against objectives set out in the UK Government and devolved administrations' (AQS)².
- 6.24 Where a local authority anticipates that an AQS objective may be breached they must designate an AQMA and develop an action plan to improve pollution levels.
- 6.25 The proposed development is located within WCBC's administrative area. The proposed gas and electricity grid connection routes are also within the same local authority boundary.

² Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Cmd paper No 7169); Department for the Environment, Food and Rural Affairs; Her Majesty's Stationary Office, July 2007.

- 6.26 There are no AQMAs designated by WCBC, or within 10 km of the proposed development in neighbouring districts and there is therefore no air quality action plan for the area.

Baseline description

- 6.27 The WEC site is within the eastern boundary of the Wrexham Industrial Estate, approximately 5.5 km to the east of Wrexham. It is in a semi-rural setting that might be expected to have relatively good air quality, although on the edge of a major industrial estate which will affect local air quality. The local road network links to the A534 to the north, the B5130 to the east and the A525 to the south.
- 6.28 Industrial premises comprising a large logistics warehouse and distribution centre operated by Norbert Dentressangle lie directly to the south of the site. Immediately to the west of the site on the opposite side of Bryn Lane is the Kellogg's manufacturing complex.
- 6.29 The closest settlements are Isycoed, approximately 900 m to the east of the site boundary, and the Pentre Maelor housing estate which is 2 km to the south-west of the site. Dispersed residential properties are located at the following distances from the site boundary:
- 250 m north-east on Ridley Wood Road
 - 280 m east along the B5130
 - 300 m north-west on Bryn Lane
 - 375 m south-east again on the B5130, including a school

Air quality

- 6.30 The 2011 Air Quality Progress Report for WCBC of March 2011 provides the latest publicly available information on local air quality monitoring in WCBC's area.
- 6.31 Measurements of pollutant concentrations can be made by deploying analytical instruments that measure continuously and record average concentrations over specified time intervals. Simpler sampling devices, such as diffusion tubes, react with pollutants over a longer time period and are subsequently analysed at a laboratory to given an average concentration for the sampling period.

Continuous monitoring

- 6.32 A continuous monitoring station is located near to the Wrexham Industrial Estate. The Wrexham Isycoed monitoring site is within a kilometre to the east of the WEC site and has been operating since January 2006. It is located at grid reference 339940,350010, approximately 60 m west of the B5130 within the school grounds of Saint Pauls (the nearest school building is 30 meters from the monitoring station). It is part of the Welsh Air Quality Network Forum's (WAQF) network of sites and is classified as urban industrial. Further information for this site can be found on the Air Quality in Wales's website³.
- 6.33 The local authority report that the annual average nitrogen dioxide concentrations measured at Isycoed were 9.8, 8.8 and 7.8 µg/m³ for the years 2008, 2009 and 2010 respectively. These results are well below the air quality objective of 40 µg/m³. There were no hourly average nitrogen dioxide concentrations above

³ <http://www.welshairquality.co.uk/index.php>

200 µg/m³ during that three year period. Note that continuous monitoring data requires quality assurance and ratification which may not be completed until sometime after the end of the monitoring year, and hence 2010 data was the most recent available at the time of preparing this scoping report.

- 6.34 The Isycoed site is also equipped with a PM₁₀ monitor, a Partisol daily gravimetric analyser. WCBC report that monitoring is to be discontinued in 2012 due to budgetary constraints. The data capture rates in 2009 and 2010 for this instrument were poor, around 30%, and hence annual average results were annualised using the procedure described in the Technical Guidance LAQM.TG(09). The adjusted annual average PM₁₀ concentration measured at Isycoed were 9.8, 23.6 and 13.1 µg/m³ for the years 2008, 2009 and 2010 respectively. These results are well below the air quality objective of 40 µg/m³. There were no measured 24 hour average concentrations exceeding 50 µg/m³ in the years 2009 or 2010 and just 15 occurrences in 2008, well within the 35 allowed occurrences specified in the air quality objective.
- 6.35 Carbon monoxide is no longer measured anywhere in or around Wrexham.

Nitrogen dioxide diffusion tube sampling

- 6.36 WCBC operates a network of passive monitoring sites equipped with diffusion tubes sampling nitrogen dioxide. One of the monitoring sites is at Hugmore Lane, a roadside location north of the Wrexham Industrial Estate. The local authority report that the annual average nitrogen dioxide concentrations measured at this site were 20.9, 20.7 and 23.8 µg/m³ for the years 2008, 2009 and 2010 respectively. These results are well below the air quality objective of 40 µg/m³ but due to the roadside location these results are somewhat higher than those measured by the continuous analyser. Existing concentrations at the project site are likely to be more in line with the results recorded at Isycoed. The bias-corrected 2011 data for diffusion tubes will only be available following the ratification of the relevant local continuous monitoring site data. The most recent and available data will be used in the PEI and EIA.

Background concentrations

- 6.37 Estimates of background pollutant concentrations for oxides of nitrogen, nitrogen dioxide, particulates such as PM₁₀ and PM_{2.5} and carbon monoxide are published on the DEFRA website⁴ for every 1 x 1 km grid square in the UK. These data are based on the extrapolation and interpolation of empirical measurements and modelled dispersion of road and industrial sources. In each grid square the background concentrations are made up of contributions from the different source sectors such as roads, and industry within and surrounding that particular cell.
- 6.38 Annual mean background concentration estimates for 2010 for the grid square centred at 339500,350500 which includes the proposed development site are shown in Table 2.

Table 2: DEFRA 2010 annual mean background concentrations, µg/m³

NO _x	NO ₂	PM ₁₀	PM _{2.5}	CO
25.8	17.8	13.7	9.5	0.24

Defra Guidelines on Conversion Factors available from their website- CO converted from 2001 value using factor of 0.483

⁴ <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

Designated ecological sites

- 6.39 The EA guidance for environmental permit applications⁵ requires an air quality assessment to address designated ecological sites. The EA recommends that conservation sites need only be considered where they fall within set distances of the activity:
- SPAs, SACs or Ramsar sites within 10 km of the installation
 - SSSIs, NNRs, LNRs and AWI, as well as non-statutory LWSs within 2 km of the location of the installation
- 6.40 This approach will be adopted in the EIA to allow an evaluation against critical levels specified for oxides of nitrogen and with regard to nitrogen deposition critical loads.
- 6.41 The DEFRA website⁶ was used to source information regarding nationally designated ecological sites in the vicinity of the proposed development. Further information on specific designated sites is published by the Countryside Council for Wales (CCW)⁷. The search results for the principal designated ecological sites within 10 km are shown in Table 3, as are the SSSIs, NNRs, LNRs and AWIs found within 2 km of the proposed development.

Table 3: Designated ecological sites

Designation	Site Name	Distance and Bearing
Ramsar Site	Midland Meres and Mosses; (Vicarge Moss)	4.5 km north west
Special Area of Conservation	River Dee and Bala Lake	2.2 km east
Special Protection Areas	None within 10 km	
Sites of Special Scientific Interest (SSSIs)	None within 2 km	
National Nature Reserves (NNRs)	None within 2 km	
Local Nature Reserves (LNRs)	None within 2 km	
Local wildlife Sites (LWSs)	None within 2 km	
Ancient Woodlands	None within 2 km	

Potential effects

- 6.42 The potential effects of the proposed development on local air quality can be broadly grouped into three categories relating to construction and operation:
- emissions associated with construction within the development site
 - emissions associated with construction of the gas pipeline and the electricity distribution network beyond the site boundary

⁵ H1 Environmental Risk Assessment Annex (f), Environment Agency, December 2011

⁶ <http://magic.defra.gov.uk/>

⁷ <http://www.ccw.gov.uk/default.aspx>

- operational discharges from the CCGT power station
- 6.43 The air quality issues associated with decommissioning and demolition are likely to be broadly comparable with those during construction and will be assessed on a similar basis.

Construction

- 6.44 At this stage a detailed schedule of works and construction programme is not available. The proposed power station is, however, likely to have a construction programme of approximately three years, including a preliminary design and site establishment stage of about six months. The piling and main foundation construction would take approximately twelve months to complete.
- 6.45 Air quality effects during construction of the CCGT facility and the gas and grid connections are likely to be adequately mitigated through the use of best practicable means and should not present a constraint to the development proposals. The rationale for this conclusion is set out below.

Dust

- 6.46 In general, there is the potential for sensitive receptor properties to be temporarily affected by dust-raising activities during the construction phase. In the event of inadequate control measures, dust deposition is most likely to be apparent at properties or industrial premises within 100 m of working areas than those further from the activities.
- 6.47 In the context of the proposed WEC development site boundary, there are no residential properties within this distance. The neighbouring industrial premises to the west and the south may be affected to some extent during the construction operations, although these may be considered less sensitive than residential properties. There may be isolated residential properties within 100 m of construction works associated with the gas and grid connections that may be subject to transient effects. The mitigation of the risks of construction dust affecting neighbouring industrial properties will be a focus of the EIA.
- 6.48 In addition, properties near roads which would be used by construction vehicles could be affected due to tracking of dust.

Transport

- 6.49 Exhaust emissions from construction traffic vehicles have the potential to affect local air quality at properties close to haul routes. From an air quality perspective, sensitive receptors include residential properties and locations where there are likely to be vulnerable occupants such as hospitals, nursing homes and schools.
- 6.50 Details of construction traffic numbers and types, and the construction workforce, are not available at this stage. Given the level nature of the site, it is not expected that significant amounts of material will need to be exported off-site, thus reducing the likely level of traffic generation.

Operation

- 6.51 The facility will be designed to operate for 8760 hours per year. Emissions to atmosphere will be from two main stacks, each associated with one gas turbine.
- 6.52 Vehicular traffic movements associated with the development during operation will arise from staff journeys to work, routine deliveries and maintenance requirements.

Post commissioning, the number of road vehicle movements is expected to be much lower than that during construction, and the operational site may generate 50 to 100 return trips daily. These movements are likely to be of negligible effect on air quality and are likely to be below the criteria for affected roads as warranting an air quality assessment (see section 1.5.1).

- 6.53 Stack emissions from the proposed CCGT facility have the potential to affect receptors considered sensitive in terms of human health, as well as designated ecological sites, certain of which may contain vegetation with the potential to be adversely affected by air pollution.
- 6.54 The air pollutant of primary relevance in the context of this assessment is nitrogen dioxide, formed from the oxides of nitrogen discharged from the gas turbines. The gas turbines will also emit minor amounts of carbon monoxide, but these will be of a level which will not lead to significant environmental effects. These stack emissions will be the subject of a detailed dispersion modelling study presented in the EIA to demonstrate the actual concentrations of air pollutants being emitted, with stack heights altered to ensure that any potential significant effects are adequately mitigated wherever possible.
- 6.55 As natural gas contains only trace amounts of sulphur, sulphur dioxide emissions are not considered to be a significant issue requiring assessment as part of the EIA process.

Decommissioning and Demolition

- 6.56 The environmental effects during decommissioning and demolition are likely to be comparable to those during construction, with the potential for dust emissions from the demolition activities and tracking of dust from construction vehicles, and air emissions from traffic vehicles.

Assessment methodology

- 6.57 The baseline conditions described above would be reviewed and updated if necessary, where further information is made available. The air quality issues associated with decommissioning and demolition are likely to be broadly comparable with those during construction. Further consideration of these issues will be undertaken through the EIA process and will be assessed on a similar basis.

Construction

Dust

- 6.58 A qualitative assessment of the potential effects of construction dust will be undertaken, with reference to the Institute of Air Quality Management's Guidance⁸ on the assessment of the effects of construction on air quality. This document provides an assessment methodology and proposes significance criteria. Reference will also be made to the Greater London Authority and the London Councils Best Practice Guidance report⁹, which describes appropriate mitigation methods, which are also applicable outside of London.

⁸ Guidance on the Assessment of the effects of Construction on Air Quality and the Determination of their Significance, Institute of Air Quality Management (IAQM), January 2012

⁹ The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance, Greater London Authority and the London Councils, 2006

- 6.59 The assessment will identify residential and other sensitive receptor locations that could be at risk of being affected by dust. It will consider the types of activities to be carried out and their duration, with specific reference to distance to receptors and direction from the source, in the context of prevailing meteorological conditions.
- 6.60 As described in the baseline section, the relevant receptors with regard to the main site construction activities are the nearby industrial premises. The construction works will employ best practice mitigation measures in order to control emissions, with consultations on the mitigation measures carried out with neighbouring industrial premises to ensure that effects upon their operation are satisfactorily minimised. It is possible, with care and good working practices, to control dust emissions to a significant degree such that any effects of dust are very unlikely to be discernible beyond the site boundary. Local residential properties will therefore not be affected by dust originating on the site itself.
- 6.61 The detailed routes of the proposed gas and grid connections and the associated construction activities will be reviewed once confirmed, to identify any sensitive properties that may be subject to transient effects due to these works. Additional mitigation measures will be recommended where appropriate.

Traffic

- 6.62 Construction traffic and any disruption to existing traffic which may cause an effect on air quality and greenhouse gas emissions will be evaluated. The Highways Agency's Design Manual for Roads and Bridges (DMRB) Volume 11.3.1 (Air Quality)¹⁰ provides criteria for identifying whether an assessment of the effect of a road scheme on air quality is required. The criteria are:
- road alignment changes by five metres or more
 - daily traffic flows change by 1,000 annual average daily traffic (AADT) or more
 - heavy duty vehicle (HDV) flows change by 200 AADT or more
 - daily average speed change of 10 km per hour (kph) or more
 - peak hour speed change of 20 kph or more
- 6.63 The methodology requires that a simple quantitative assessment of the effect on local air quality of construction traffic is required when one or more of these criteria is exceeded. The assessment of construction traffic air quality effects will comprise a review of background local air pollutant concentrations, identification of affected roads and sensitive receptors (residential properties, schools, nursing homes, ecological receptors) within 200 m of those roads, assessment of changes in traffic flow and speed as a result of the construction traffic, and estimates of the resulting change in pollutant concentrations at receptor locations due to vehicle emissions.

Operation

Traffic emissions

- 6.64 Additional vehicle movements arising from staff journeys and routine deliveries are likely to be below the DMRB criteria for affected roads as warranting a quantitative

¹⁰ Design Manual for Roads and Bridges; Volume 11; May 2007; Highways Agency. Available at <http://www.standardsforhighways.co.uk/dmr/index.htm>

air quality assessment. It is estimated that 50 to 100 return trips daily will be generated through the operation of the development. This will be confirmed in the EIA when the specific traffic estimates are available.

Stack emissions

- 6.65 A detailed dispersion modelling study of the gas turbine emissions will be undertaken using the US EPA regulatory model AERMOD. The EIA will consider the main combustion product, oxides of nitrogen, for the main stack discharges to atmosphere. Hourly sequential meteorological data from the nearest suitable meteorological station for a five year period will be used in the model. If available, meteorological data that is recorded locally for example from neighbouring businesses in the industrial estate will be used to provide a level of local validation of this meteorological station data. The modelling grid will be designed such that the maximum area of ground level concentrations and concentrations at sensitive receptors, including ecological sites, will be adequately covered for both short-term and long-term averaging periods.
- 6.66 The minimum acceptable stack height will be determined through a stack height calculation using the Technical Guidance Note D1¹¹. The modelling study will consider a single scenario for the normal operational load conditions, assuming operation for 8760 hours per year.
- 6.67 The dispersion model results will be tabulated and results will be presented as contour plots for the entire modelled domain, overlain on a suitable base map. The maximum modelled concentrations at residential properties and other potentially sensitive receptors will be evaluated in terms of existing concentrations and the AQS objectives, in accordance with EA Technical Guidance H1 Annex (f).
- 6.68 The effects of the oxides of nitrogen and carbon monoxide emissions from the facility on human health will be assessed. The assessment will also consider those statutory designated nature sites within a relevant distance of the project site, where these contain species sensitive to air pollutants. The modelled annual average oxides of nitrogen concentrations will be evaluated in the context of critical levels and nitrogen and acid deposition rates will be compared with critical loads for the relevant habitat types.
- 6.69 Consideration of cumulative effects will be undertaken with reference to existing industrial emissions, which will be accounted for in the background concentrations used. Other proposed and committed developments will be considered through the interpretation of the relevant air dispersion modelling studies and/or transport assessments where these are available. If suitable studies are not available, a qualitative evaluation will be undertaken.

Decommissioning and Demolition

- 6.70 A qualitative assessment of the potential air quality effects during decommissioning and demolition will be undertaken, based on an broad consideration of dust issues and traffic emissions.

¹¹ HMIP Technical Guidance Note (Dispersion) D1: Guidelines on Discharge Stack Heights for Polluting Emissions; 1993; Her Majesty's Inspectorate of Pollution; ISBN 0-11-752794-7

Significance criteria

- 6.71 The results of the air dispersion modelling study will be evaluated in line with EA H1 horizontal guidance document and the Environmental Assessment Levels (EALs) contained therein.
- 6.72 For traffic emissions, the affected road network will be defined in accordance with the DMRB criteria. The local air quality assessment (if required) will compare results with the relevant National (AQS) objectives and European Union (EU) Limit Values. Significance will be interpreted on the basis of existing pollution levels, the magnitude of change and extent of any exceedance of air quality criteria. The significance of the findings of the assessment will be considered with reference to EPUK's 2010 guidance for development control (now hosted by IAQM).
- 6.73 For ecological sites, the DMRB recommends that where increments of more than 2 µg/m³ to the annual average NO_x concentration are identified at designated sites, further advice on the potential effect on vegetation should be sought from an ecologist. Where the calculated nitrogen deposition rate increases by less than 1% of the critical load or background rate, CCW advises that this should be interpreted as not significant. However, it should be noted that an exceedance of this criterion does not indicate that the increment is either significant or unacceptable, but that a more detailed interpretation of the data is required.

Potential mitigation

Construction

- 6.74 Construction dust will be controlled in accordance with good practice and the BATs, and mitigation measures will be incorporated into a Construction Environmental Management Plan (CEMP). Such measures for the main project site may include but not necessarily be limited to:
- regular water-spraying and sweeping of unpaved and paved roads to minimise dust and remove mud and debris
 - using wheel washes, shaker bars or rotating bristles for vehicles leaving the site where appropriate to minimise the amount of mud and debris deposited on the roads
 - sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling
 - enforcing speed limits for vehicles on unmade surfaces to minimise dust entrainment and dispersion
 - non-road mobile machinery to be compliant with the NMRR (Emissions of gaseous and particulate pollutants) Regulations 1999
 - ensuring any temporary site roads are no wider than necessary to minimise surface area
 - dampening down of surfaces prior to them being worked
 - storing dusty materials away from site boundaries and in appropriate containment (e.g. sheeting, sacks, barrels etc)
 - limiting stock pile heights and dampening down in dry weather
 - limiting material drop heights during bulk transfers

- 6.75 If appropriate, following the full assessment which will be undertaken for the EIA, additional mitigation measures will be proposed.
- 6.76 A similar range of mitigation measures may be applicable to the construction works associated with the electrical and gas connections to the power station, subject to the nature and intensity of the works involved.
- 6.77 Where mitigation measures rely on water, it is expected that sufficient water will be applied to damp down material but that there should not be any excess to potentially contaminate local water courses.
- 6.78 The Transport Assessment for the project will consider site accessibility by public transport and other sustainable modes of transport. A Framework Travel Plan (FTP) will be prepared for the project construction and operational traffic. These measures will seek to reduce traffic generation, and therefore potential air quality effects.

Operation

- 6.79 Mitigation will be inherent in the design of the facility with regard to controlling emissions.
- 6.80 The plant will require an Environmental Permit to operate and as a consequence will be required to demonstrate BAT as described in the EA's Environmental Permit Regulations guidance¹². This guidance advises that the use of dry low NOx burners in new natural gas-fired gas turbines represents BAT. The EA quotes an emission benchmark for oxides of nitrogen of 20 to 50 mg/Nm³ at reference conditions of 101.3 kPa, 273 K and 15% oxygen (dry basis).

Decommissioning and Demolition

- 6.81 Dust emissions and the impacts of traffic emissions would be controlled in accordance with good practice for environmental management during decommissioning and demolition and by means similar to those employed during construction.

Ground conditions

Introduction

- 6.82 This section reviews the ground and contaminated land issues associated with construction and operation of the WECC. The government's good practice guide for EIA¹³ states that the following potential environmental effects should be considered:
- physical effects of the development – for example changes in topography, soil compaction, soil erosion, ground stability etc
 - effects on geology as a valuable resource – for example mineral resource sterilisation, loss or damage to regionally important geological sites, geological Special Site of Scientific Interest (SSSIs) etc

¹² Combustion Activities (EPR 1.01), Environment Agency, March 2009

¹³ Department for Communities and Local Government, 2006. Environmental Impact Assessment. A Guide to Good Practice and Procedures. A consultation paper. London: DCLG.

- effects on soils as a valuable resource – e.g. loss or damage to soils with good agricultural quality
- effects associated with ground contamination that may already exist on site – for example introducing/changing pathways and receptors
- effects associated with the potential for polluting substances used (during construction/operation) to cause new ground contamination issues on site – for example introducing/changing the source of contamination
- effects associated with re-use of soils and waste soils – re-use of site-sourced materials on or off site, disposal of site-sourced materials off-site, importation of materials to the site etc

6.83 The environmental aspects of relevance to the WECC proposals are related to:

- soils as a valuable resource this is discussed within this scoping report under the section on Agriculture
- the implications of soil/material quality for re-use – this is discussed within this scoping report under the section on Waste
- ground contamination this is discussed below in this section of the scoping report on Ground Conditions

Study area

6.84 There are two stages in defining the study area for contaminated land; firstly the identification of sources of contamination and secondly the identifications of receptors that could be affected.

6.85 The study area for potential sources of contaminated land includes land within the footprint of and in close proximity to land that will be subject to ground disturbance during construction and operation of the WECC. The study area for contaminated land sources will therefore extend to 500 m from the boundary of the power station site and 500 m either side of the gas and grid connection routes.

6.86 The presence of receptors that could be affected by ground contamination will then be determined through consideration of a 2 km study area from the centre of a potential source of contamination where identified.

Existing information

Policy approach to dealing with contaminated land

6.87 The Government's objectives with respect to ground contamination are set out in the Welsh Government's Contaminated Land Statutory Guidance¹⁴ and form the basis of the 'suitable for use' approach to the assessment and remediation of contaminated land. The 'suitable for use' approach consists of three elements:

- ensuring the land is suitable for its current use – this is afforded through the contaminated land regime and Part 2A of the Environmental Protection Act 1990

¹⁴ Welsh Government, 2012. Contaminated Land Statutory Guidance for Wales. Number WG15450.

- ensuring that land is made suitable for any new use, as planning permission is given for that new use, as set out in sections 13.5 to 13.9 of Planning Policy Wales¹⁵
- limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment

Part 2A of Environmental Protection Act 1990

- 6.88 Part 2A of EPA 1990 includes a statutory definition of 'contaminated land', i.e. land that presents an unacceptable risk. Contaminated land is land which appears to the local authority to be in such a condition that:
- significant harm is being caused, or
 - there is a significant possibility of such harm being caused, or
 - pollution of controlled waters is being caused, or
 - pollution of controlled waters is likely to be caused
- 6.89 Section 86 of the Water Act 2003¹⁶ when fully commenced will amend the definition of contaminated land and introduce the test of significance for pollution of controlled waters and is the subject of technical guidance published by the EA.
- 6.90 The approach to determining significant harm or pollution includes the concept of a contaminant, a receptor and a pathway, which, if combined, form a pollutant linkage. For each receptor, a description of the harm that is to be regarded as significant harm, and therefore is a significant pollutant linkage, is given in the statutory guidance. Receptors include human beings, ecological systems, property such as crops and livestock, buildings and their services. Significant harm includes in appropriate cases death, disease, serious injury, specified ecological system effects, substantial diminution of crop yield and structural building failure. Pollution of controlled waters, including groundwater and surface water courses, arising from the contaminated condition of land is also included in the regime.

Planning and land affected by contamination

- 6.91 The planning system aims to control development and land use. In most respects, the underlying approach to identifying and dealing with risk, and the overall policy objective of safeguarding human health and the environment, are similar to the Part 2A system. A wider range of contamination and receptors is relevant to planning because of its wider spatial perspective, but the degree of harm or pollution relevant to planning and the approach to remediation are essentially the same, i.e. unacceptable risk in planning terms includes the risks addressed by Part 2A of EPA 1990.
- 6.92 To avoid confusion with the statutory term 'contaminated land' and its definition, and to reflect the different context and scope of planning control, the wider term "*land affected by contamination*" is used. This is intended to cover all cases regardless of whether or not the land meets the statutory definition in Part 2A.

¹⁵ Planning Policy Wales Edition 4. February 2011. Chapter 13 Minimising and Managing Environmental risks and Pollution.

¹⁶ Water Act 2003. (c.37), London: HMSO.

Building control

- 6.93 Building work is subject to Building Control under the Building Regulations 1991¹⁷. Under Schedule 1 of these Regulations, Requirement C2 states that "*precautions shall be taken to avoid danger to health and safety caused by substances found on or in the ground covered by the building.*" It should be noted that if contaminating substances in the ground have the potential to attack building materials it may lead to a breach of Part A of these Regulations which relate to structural safety. Approved Document C¹⁸ sets out how contamination should be addressed in building control:
- site investigations should be carried out to determine the extent and nature of any contamination.
 - any ground covered by the building must be reasonably free from any material that might damage the building or affect its stability.
 - reasonable precautions must be taken to avoid danger to health and safety caused by contaminants on or in the ground covered by the building and any land associated with the building.
 - precautions must be taken against ground gases such as landfill gases, radon, vapours etc.

Contaminated land risk assessment

- 6.94 The principle guidance document on managing contaminated land is the EA's report CLR11¹⁹. This provides a technical framework for identifying and remediating contaminated land, through the application of a risk management process.
- 6.95 The question of whether risk is unacceptable in any particular case involves not only scientific and technical assessments, but also appropriate criteria to judge the risk and conclude on exactly what risk would be unacceptable.
- 6.96 The process of risk assessment is summarised as follows:
- **develop a preliminary Conceptual Site Model** – carry out a desk study review of available documentary information and identify the potential hazards/sources, pathways and receptors relevant to the site, and the potential pollutant linkages and geo-environmental hazards.
 - **gather site-specific information on the Conceptual Site Model** – through site investigation, gather information on the nature and extent of contamination or other geo-technical hazards, details of pathways for migration of contamination, specific information on the receptors to update the model.
 - **risk assessment** - apply criteria that will enable a judgement as to whether the concentrations of contaminants in soil represent an unacceptable risk. These criteria must be relevant to each pollutant linkage, and can be generic criteria, or can be site-specific. Generic assessment criteria are concentrations of a contaminant in soil below which the risk is acceptable. Site-specific assessment criteria are concentrations of a contaminant in soil above which there is likely to be an unacceptable risk.

¹⁷ Building Regulations 2010. SI 2010/2215, London: HMSO.

¹⁸ Office of the Deputy Prime Minister, 2010. Approved Document C - Site preparation and resistance to contaminants and moisture. London: HMSO.

¹⁹ Department of Food and Rural Affairs & Environment Agency, 2004. Model Procedures for the Management of Land Contamination, Contaminated Land Report 11. Bristol: Environment Agency.

- 6.97 If a site passes based on the application of generic assessment criteria, then it is likely that no remedial action is required. If a site fails, then there may be a benefit in gathering further information and deriving site specific assessment criteria. If a site then also fails on the application of site specific criteria, then remedial action will be required.
- 6.98 The EA has published extensive guidance on the technical aspects of risk assessment, which forms the recognised basis of the UK approach to identifying whether land affected by contamination presents an unacceptable risk.

Environmental permitting and pollution control

- 6.99 There are a wide range of legal requirements that address such issues and best practice guidance documents produced by the EA and organisations such as CIRIA which are designed to prevent pollution during construction and operation of industrial facilities.
- 6.100 Of relevance to the operation of the WEC is the Environmental Permitting (EP) regime. The EP Regulations²⁰ came into force in 2010 combining the PPC and Waste Management Licensing (WML) regulations. The regulations require operators of certain processes and activities to have an Environmental Permit, or an exemption, and to operate within specific conditions which will be under the ongoing supervision of the EA. As part of the permitting requirements an application site report is required that identifies the contaminated land status of the site prior to the operation of the permitted process, and which defines the land quality to which the site must return on surrender of the permit.

Baseline description

- 6.101 The study area comprises the WEC site where the proposed power station will be located and the corridors along which the gas and electricity grid connections are to be established. For the purposes of this report the baseline condition of the various route corridors currently being considered has been included. The overall baseline conditions within 500 m of the proposed development area are summarised below. The contaminated land baseline has been evaluated utilising the following sources of information:
- historical maps available from Old-Maps on the website <http://www.old-maps.co.uk/maps.html>
 - SKM Enviros. May 2011. Proposed Combined Cycle Gas Turbine Plant at Wrexham Industrial Park, Draft Phase 1 Desk Study.

Geology, hydrogeology and hydrology

- 6.102 The British Geological Survey (BGS)²¹ website has been reviewed in order to establish the geological conditions along the scheme footprint. The entire scheme area is underlain by superficial Till deposits comprising dominantly sand and gravels. The services corridor crosses occasional alluvial deposits associated with the many surface water streams which are present in the scheme area; areas close to Woodhouse Lane, Sontley and Hafod Road are underlain by superficial glaciofluvial deposits. The bedrock geology has been divided in to the following sections:

²⁰ Environmental Permitting (England and Wales) Regulations 2010. SI 2010/675, London: HMSO.

²¹ BGS website <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> viewed 8 May 2012

- the WEC site is underlain by the Salop Formation, comprising mudstone, sandstone and conglomerate and the Kinnerton Sandstone Formation.
 - moving east – west along the grid connection corridors, the bedrock geology comprises Kinnerton Sandstone Formation (until approximately Cross Lanes), Salop Formation (until approximately Sontley) and the Etruria Formation (until approximately Hafod-y-bwch). The remainder of the scheme and Legacy substation site are underlain by Pennine Lower and Middle Coal Measures (undifferentiated).
- 6.103 The younger (Carboniferous) Kinnerton Sandstone in the south eastern region of the study area lie uncomfortably over the older Triassic (Westphalian) Salop, Etruria and Pennine Coal Measures.
- 6.104 The bedrock is cross-cut by numerous faults trending both north-south and east-west; faults in the south and west of the scheme area are generally downthrown to the south or east. Localised faulting in the central / northern area (north of the services corridor) is to the west. Bedrock dip is generally approximately 20° to the east / south east.
- 6.105 The majority of the proposed scheme area does not overlie aquifers or groundwater source protection zones²²; the exceptions to this are summarised below:
- The WEC site is underlain by a Principal bedrock aquifer associated with the Kinnerton Sandstone of the Sherwood Sandstone Group; a groundwater source protection zone (Inner, Outer and Total) lies approximately 1 km to the south. A superficial Secondary A aquifer associated with alluvial deposits is located approximately 1 km south of the power station site. The eastern end of the grid connection corridors also crosses these areas.
 - The existing Legacy substation at the western end of the grid corridor lies approximately 500 m west of a superficial Secondary A aquifer and 750 m northeast of an Inner and Total groundwater source protection zone.
- 6.106 Groundwater in the sandstone is beneath 40-60 m of Glacial Till and is therefore not likely to be significantly impacted by contamination that may exist at the site.
- 6.107 There are a number of ponds within the WEC site boundary, and numerous drainage ditches along adjacent field boundaries. The area immediately north of the site is shown on Ordnance Survey mapping to be marshy. Approximately 1.3 km south of the power station site, the River Clywedog flows south eastwards towards its confluence with the River Dee (approximately 2.2 km east of the site). The grid connection corridors cross numerous small unnamed streams, as well as the following larger streams (moving east – west): Gefeiliau Brook, Black Brook and Pentrebychan Brook. The area south of the grid corridor contains numerous ponds and there are also occasional springs.

Potential for existing contamination

- 6.108 In order to identify potential historical sources of contamination which may be present at and adjacent to the WEC site and the connection corridor, a number of historical O.S. maps have been reviewed.

²² Environment Agency website: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e Accessed 8 May 2012.

Wrexham Energy Centre site

- 6.109 The earliest historical mapping (1873) indicates that the site was agricultural / open fields with a number of ponds in the north and south of the site and a farm to the southwest. The area remained undeveloped until a large factory and electricity substation are shown on mapping from 1972. The factory is the former Owen's Corning plant understood to have manufactured glass fibre and associated products, and there were car parking areas, concrete storage silos and hardstanding. The factory buildings have been demolished and the hardstanding and foundations are still present.
- 6.110 Land adjacent to the site was generally undeveloped until approximately 1954 when mapping shows a number of buildings (later to be called Wrexham industrial Park) and railway infrastructure. The railway was associated with the Wrexham Royal Ordnance Factory, located 250 m west of the site.
- 6.111 The 1982 map records the construction of other large building immediately to the west and south of the site. Various industrial and commercial works, tanks, further substations, road links and associated infrastructure have been built as part of the Industrial Park development.
- 6.112 The EA website identifies a former landfill site within the Industrial Park, approximately 500 m south of the proposed construction site. Records indicate that the site was called BICC Cables Ltd., and was operational between 1968 and 1977, receiving inert and liquid / sludge waste. A further landfill was operated approximately 750 m west of the site, however no further details of operational dates or waste types are available.
- 6.113 Ground contamination may be present within the WEC site from the historical industrial land-use on site and from adjoining sites; this could include contaminants associated with glass fibre manufacture, chemical and fuel spillages, unexploded ordnance from the munitions factory or WWII bombing, ground gases and leachates from the adjacent landfill site, and general Made Ground from construction and demolition activities.

Gas and electricity connection route corridors

- 6.114 The grid corridors cross mostly undeveloped rural / agricultural land. The principal features of interest in this section of the scheme comprise:
- Industrial land uses, both historic and current, at the Wrexham Industrial Estate and the gas distribution works at Talwrn
 - Ordnance Survey mapping indicates a dismantled railway south of the gas distribution works at Talwrn
 - a sewage works approximately 500 m east of Marchwiel
 - a number of inert closed landfill sites within the route corridors, such as at Cross Lane, Woodhouse Farm and Clay Pits Farm
 - a former landfill at Middle Sontley Farm, operational between approximately 1977 – 1979, disposing of inert, domestic and industrial waste
 - the disused collieries and spoil tips north of the town of Rhosllanerchrucog associated with the former Hafod and Bersham collieries
 - a number of landfill sites in the vicinity of Legacy substation, the closest of which is Llwyneinion Old Refuse Tip No. 2 which EA records indicate accepted commercial and household waste between approximately 1939 – 1961

- 6.115 There is the potential for contaminants to be present as a result of all of these previous / current activities, including ground gases and vapours emanating from the former landfill sites. Contaminants could include chemicals from the 'works', leachate, untreated sewage, fuels and mining waste, possibly including 'acid mine drainage' (metal-rich seepages) type contaminants. The agricultural land uses may also result in contamination from pesticides, herbicides and fuel storage.

Potential effects

- 6.116 The WEC site is partly brownfield land having been the location of the former Owens Corning fibreglass factory. Part of the site and the route corridors comprise undeveloped agricultural land. There are no reported sites determined under Part 2A of the Environmental Protection Act 1990 within the WEC site or the grid connection route corridors, therefore the land affected by the development proposals is considered as already 'suitable for use' in its current state.
- 6.117 Construction, operation, decommissioning and demolition processes for developments such as the WECC have the potential to give rise to contamination of the ground through, for example, the following:
- causing new ground contamination due to the failure to adequately control the storage, transfer and use of polluting substances, for example spills of oils/fuels used for construction vehicles and equipment, spillages of chemicals used for treatment of water in the power station plant
 - introducing new pathways such that existing ground contamination becomes connected to a receptor where there was no connection before, for example as can happen when drilling or piling through contaminated land
- 6.118 Human health receptors which could be affected by existing contaminated land that could be present at the WEC site include construction workers, workers and visitors at adjacent units within Wrexham Industrial Park and members of the public in the wider area. Within the route corridors for the grid connections, human health receptors which could be affected by contaminated land should it exist would also include construction workers and members of the public living, working and visiting the area where construction works are being carried out.
- 6.119 Controlled waters receptors potentially at risk due to ground contamination, if it exists, include perched groundwater in the Till deposits, Principal and Secondary A aquifers, groundwater source protection zones, surface water courses, ditches and ponds.
- 6.120 Property receptors may include structures, services or other infrastructure constructed in areas affected by contamination for the purposes of the Energy Centre.
- 6.121 There are no recorded statutory designated geological sites within 1 km of the proposed scheme.
- 6.122 Based on the available desk study information, a Preliminary Conceptual Site Model (PCSM) has been prepared with respect to the redevelopment and future use of the WEC site and the grid connection corridors as detailed in Table 4.

Table 4: Preliminary conceptual site model

Sources of Contamination	Receptor	Exposure Pathway
Historical On Site Sources: Former industrial uses including the Owens Corning fibreglass factory. Made Ground generated by the construction and demolition activities on the site. Potential imported fill of unknown origin (risk of contamination in soil and burial of organic material with potential to generate landfill gasses). Spillages of fuel and chemicals during use as an industrial site. Historical Off Site Sources Soil leachate, mobile contaminants and ground gases. Commercial properties to the west in the wider industrial estate area including the former Royal Ordnance Factory. Farms to the east of the site (storage of fuel and chemicals). Infilled Ponds (unknown backfill material). Potential New Sources Polluting substances used during construction such as fuels, oils, cements Polluting substances used during operation such as water treatment chemicals, equipment maintenance oils/lubricants.	Human Health: Future site users and maintenance staff Occupiers of nearby sites Construction workers during development and occupiers of, and visitors on, adjacent sites Members of the public in the wider area including users of the adjacent public rights of way	Dermal contact with contaminated soils and soil-derived dusts Ingestion of soil and soil-derived dust Inhalation of soil and soil derived dusts Inhalation of gases and vapours including asphyxiation in confined spaces
	Property: New buildings including foundations, services (e.g. water pipes)	Migration of contaminants along preferential pathways e.g. services or structures Migration of explosive methane gas into buildings Direct contact of buildings and structures with contaminants including impacted groundwater
	Controlled Waters: Surface waters e.g. on site ponds and drainage ditches Perched groundwater in the glacial Till deposits Groundwater in the Principal and Secondary A aquifers, source protection zones	Leaching/migration of contaminants through the unsaturated zone Migration of contaminants to nearby watercourses via land drains

Assessment methodology

Basis of the assessment

6.123 For the WEC site, the assessment will be based on a thorough desk study review of the following information sources:

- a site walkover reconnaissance of the site and its immediate surrounds
- a Landmark Envirocheck report for the power station site covering the site and its surrounds (up to 2 km from the site boundary) to include historical and current ordnance survey maps

- research of local information sources on the activities associated with the Owens Corning works formerly located on the power station site, and on historical activities within the wider area including the former Ministry of Defence munitions works
 - data held on websites including EA, British Geological Survey and CCW
 - consultation with the local authority Contaminated Land, Planning and Building Control departments, and with the EA for information held on contaminated land within the study area
- 6.124 Furthermore, for the WEC site, a preliminary site investigation will be undertaken to obtain information on the nature and extent of potential contamination at the site. This will consider potential contaminated land risks associated with soil and groundwater pollution and ground gas issues. The site investigation will focus on providing information for a quantitative risk assessment of contaminated land issues, and to provide information on ground engineering properties sufficient to inform an outline ground engineering design for the power station. The scope of the site investigation and subsequent risk assessment will be agreed with the WCBC and EA beforehand.
- 6.125 For the gas and electricity grid connections, the assessment will be based on a desk study review of the following information:
- a site walkover reconnaissance of the route corridor focusing on areas for access and construction, and potential locations for the siting of pylon bases
 - a review of historical and current ordnance survey maps available focusing on areas for access and construction, and potential locations for the siting of pylon bases.
 - data held on websites including EA, British Geological Survey and CCW
 - consultation with the local authority Contaminated Land, Planning and Building Control departments, and with the EA for information held on contaminated land within the study area
- 6.126 The information on the WEC site and the connection route corridors will form the basis of a contaminated land risk assessment and subsequent impact assessment.

Contaminated land risk assessment

- 6.127 The process of contaminated land risk assessment is defined in CLR11 as follows:
- hazard identification – establishing contaminant sources
 - hazard assessment – establishing pathways and receptors, identifying pollutant linkages
 - risk estimation – predicting the likelihood of harm/pollution occurring (probability assessment) and the degree of harm/pollution (consequence assessment)
 - risk evaluation – deciding whether the risk is significant and/or unacceptable
- 6.128 The hazard identification and assessment stage concludes in the development of the Conceptual Site Model (CSM). This is the description of the pollutant linkages formed (or potentially formed) when a source of contamination is linked to a receptor via a pathway of exposure/migration.

- 6.129 When there are no relevant data on the levels of land contamination at a site, a qualitative contaminated land risk assessment is undertaken using a 'matrix approach' to account for the probability and consequence associated with the pollutant linkages. Where there are site data, a quantitative contaminated land risk assessment is undertaken by comparing the data to relevant assessment criteria. These assessment criteria typically include factors related to probability (e.g. 95th percentile values for human health exposure rates etc.) and consequence (unacceptable intake doses for human health).
- 6.130 Risk evaluation is the process of deciding whether a risk is acceptable or not and entails the application of evaluation criteria. These evaluation criteria are set in relation to a level of harm or pollution to the specific receptor. They may be absolute standards or recommended limit values e.g., a health criteria value for the intake of a substance.
- 6.131 Where there is no site data and a purely qualitative risk assessment is undertaken, the evaluation criteria are based on value judgements as to whether the contaminated land risks are acceptable or not. For quantitative risk assessments based on some site specific data, there are various threshold levels that determine the level of significance of the contaminated land risks, e.g. generic assessment criteria below which the risk is considered to be acceptable and site specific assessment criteria above which the risk is unacceptable.
- 6.132 Definitions of probability and consequence are given in the following guidance.
- NHBC and EA R&D66²³ - providing general guidance on the development and application of the consequence and probability "*matrix approach*" to contaminated land risk assessment, and broad definitions of consequence.
 - CLR11 – recognising the tiered approach to risk assessment and the use of generic and site specific assessment criteria through the application of preliminary and quantitative risk assessment.
 - Circular 01/2006 – providing the statutory definitions of significant harm and significant possibility of significant harm for human health, ecosystem and property receptors.
 - EA technical advice on pollution of controlled waters²⁴ - providing the Agency's policy and definitions on significant pollution of controlled waters.
 - The RIDDOR regulations²⁵ and the HSE's workplace exposure limits²⁶ - defining legal standards and requirements in relation to significant risks for construction workers.
- 6.133 These sources of guidance have been used to develop definitions of probability that will be used for the impact assessment as given in Table 5, and consequence in Table 6.

²³ National House-Building Council & Environment Agency, 2008. Guidance on the Safe Development of Housing on Land Affected by Contamination. London: NHBC and Environment Agency (R&D66).

²⁴ Environment Agency, 2002. Technical Advice to Third Parties on Pollution of Controlled Waters for Part IIA of the EPA1990. Version 2. Bristol: Environment Agency.

²⁵ The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995. SI 1995/3163, London: HMSO.

²⁶ Health & Safety Executive, 2007. Table 1: List of Approved Workplace Exposure Limits (as consolidated with amendments October 2007) [online]. Health & Safety Executive. Available from: <http://www.hse.gov.uk/coshh/table1.pdf> [Accessed 19 July 2008].

Table 5: Risk estimation - classification of probability

Classification	Definition of the Probability of Harm/Pollution Occurring
High Likelihood	The pollutant linkage exists and it is very likely to result in harm/pollution in the short term, and/or will almost inevitably result in harm/pollution in the long term, and/or there is current evidence of harm/pollution. Likelihood is defined as more likely than not and meets the definition of 'significant possibility' under Part 2A of EPA 1990.
Likely	The source, pathway and receptor exist for the pollutant linkage and it is probable that harm/pollution will occur. Circumstances are such that harm/pollution is not inevitable, but possible in the short term and likely over the long term. Likelihood is defined as reasonably possible and meets the definition of 'significant possibility' under Part 2A of EPA 1990.
Low Likelihood	The source, pathway and receptor exist and it is possible that harm/pollution could occur. Circumstances are such that harm/pollution is by no means certain in the long term and less likely in the short term.
Unlikely	The source, pathway and receptor exist for the pollutant linkage but it is improbable that harm/pollution will occur even in the long term.

Table 6: Risk estimation - classification of consequence

Classification	Definition of Consequence
Human Health Receptors – Site end use or other more sensitive receptor	
Severe	Acute damage to human health based on the effects on the critical human health receptor. Concentrations of contaminants above appropriate site specific assessment criteria. Harm meets definition of 'significant harm' under Part 2A of EPA 1990.
Medium	Chronic damage to human health based on the effects on the critical human health receptor. Concentrations of contaminants above appropriate site specific assessment criteria. Harm meets definition of 'significant harm' under Part 2A of EPA 1990.
Mild	No appreciable impact on human health based on the potential effects on the critical human health receptor. Concentrations of contaminants above generic assessment criteria but below appropriate site specific assessment criteria.
Minor	No appreciable impact on human health based on the effects on the critical human health receptor. Concentrations of contaminants below appropriate generic assessment criteria.
Human Health Receptors – Site construction workers	
Severe	Exposure to hazardous substances resulting in a reportable death, major injury, 3-day injury or illness/disease under RIDDOR.
Medium	Exposure to hazardous substances resulting in a dangerous occurrence reportable under RIDDOR. Exposure to hazardous substances resulting in exceedance of a workplace exposure limit.
Mild	Exposure to hazardous substances resulting in limited effects such as headache, dizziness, nausea. Exposures below the workplace exposure limits. Not reportable under RIDDOR.
Minor	Minor exposure to hazardous substance resulting in no appreciable ill health effects.
Controlled Water Receptors	

Classification	Definition of Consequence
Severe	Pollution of a Principal aquifer within a source protection zone or potable supply characterised by a breach of drinking water standards. Pollution of a surface water course characterised by a breach of an EQS at a statutory monitoring location or resulting in a change in GQA grade of river reach. Discharge of a List I or List II substance to groundwater. Pollution meets Part 2A definition.
Medium	Pollution of a Principal aquifer outside a source protection zone or a Secondary A aquifer characterised by a breach of drinking water standards. Pollution of an industrial groundwater abstraction or irrigation supply that impairs its function. Substantial pollution but insufficient to result in a change in the GQA grade of river reach. Pollution meets Part 2A definition.
Mild	Low levels of pollution of a Principal aquifer outside a source protection zone or an industrial abstraction, or pollution of a Secondary aquifer. Low levels of pollution insufficient to result in a change in the GQA grade of river reach, pollution of a surface water course without a quality classification.
Minor	No appreciable pollution, or pollution of a low sensitivity receptor such as a non-aquifer or a surface water course without a quality classification
Property Receptors – Buildings, Foundations and Services	
Severe	Catastrophic damage to buildings, such as explosion. Catastrophic failure of foundations and services. Substantial damage to a Scheduled Monument significantly impairing the by reason of which the monument is scheduled. Harm meets definition of 'significant harm' under Part 2A of EPA 1990.
Medium	Substantial damage to buildings and foundations rendering the structures unsafe. Substantial damage to services impairing their function. Significant damage to a Scheduled Monument significantly impairing the reason of which the monument is scheduled. Harm meets definition of 'significant harm' under Part 2A of EPA 1990.
Mild	Significant damage to buildings and foundations but not resulting in them being unsafe for occupation. Damage to services but not sufficient to impair their function. Damage to a Scheduled Monument but no significant impairment to the reason of which the monument is scheduled.
Minor	Easily repairable damage to buildings, foundations and services.
Property Receptors – Crops and Livestock	
Severe	Substantial loss in the value of crops or domestically-grown produce. Death to livestock, domesticated animals or wild animals subject to shooting or fishing rights. Harm meets definition of 'significant harm' under Part 2A of EPA 1990.
Medium	Substantial diminution in yield (over 20% reduction) of crops or domestically-grown produce. Serious disease or other serious physical damage to livestock, domesticated animals or wild animals subject to shooting or fishing rights. Harm meets definition of 'significant harm' under Part 2A of EPA 1990.
Mild	Harm to crops but not resulting in a substantial loss in value or diminution in yield (less than 20% reduction). Limited harm in terms of disease or other physical damage to livestock, domesticated animals or wild animals subject to shooting or fishing rights.
Minor	No appreciable harm, or harm to a low sensitivity receptor.

6.134 The contaminated land risk, a function of the probability and the consequence, is then defined using the risk matrix given in Table 7 which is taken from the NHBC and EA's guide R&D66.

Table 7: Estimation of the level of risk by comparison of consequence and probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

6.135 The descriptions of the classified risks as given in R&D66, are as follows:

- Very high risk:

There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.

- High risk:

Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.

- Moderate risk:

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

- Low risk:

It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

- Very low risk:

It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

- No potential risk:

There is no potential risk if no pollution linkage has been established.

Contaminated land impact assessment

- 6.136 The approach to the impact assessment will entail undertaking contaminated land risk assessments for each of the following.
- **Baseline Contaminated Land Risk Assessment**
the development of the CSM for the site based on its current sources, pathways and receptors and an assessment of the current contaminated land risks
 - **Construction Phase Contaminated Land Risk Assessment**
the development of the CSM and risk assessment for the construction phase, addressing the potential for new sources of contamination to be introduced to the site and the change in pathways and receptors
 - **Operational Phase Contaminated Land Risk Assessment**
the CSM for the developed site, reflecting the final site conditions including the status of contamination sources and the changes in the receptors
 - **Decommissioning and Demolition Phase Contaminated Land Risk Assessment**
the development of the CSM and risk assessment for the decommissioning and demolition phase, addressing the potential for new sources of contamination to be introduced to the site and the change in pathways and receptors
- 6.137 The impact assessment is then undertaken by comparing the Baseline with the Construction Phase Risk Assessment, the Baseline with the Operational Phase Risk Assessments, and the Baseline with the Decommissioning/Demolition Phase Risk Assessments.. The impact assessment includes the mitigation measures that will be included to address the potential environmental effects. This CSM comparison approach allows the changes in contaminated land status during construction and during operation of the site to be identified as either positive, neutral or negative effects and consideration of whether they are major, moderate or minor. Table 8 presents an explanation of these significant criteria.

Table 8: Significance criteria – contaminated land risk and part 2A status

Significance Criteria	Definition
Major adverse effect	For example, land that has a very low contamination risk in the baseline becomes a high or very high risk. Land that does not meet the statutory definition of Contaminated Land in the existing baseline becomes capable of being determined under Part 2A.
Moderate adverse effect	For example, land that has a low contamination risk in the baseline becomes a moderate or high risk. Land that does not meet the statutory definition of Contaminated Land in the existing baseline becomes capable of being determined under Part 2A.
Minor adverse effect	For example, land that has a low contamination risk in the baseline becomes a moderate/low risk.

Significance Criteria	Definition
Neutral effect	No change in the risks presented by contamination.
Minor beneficial effect	For example, land that has a moderate/low contamination risk in the baseline becomes a low risk.
Moderate beneficial effect	For example, land that has a high contamination risk in the baseline becomes a moderate/low or low risk. Land that meets the statutory definition of Contaminated Land in the existing baseline is no longer capable of being determined under Part 2A.
Major beneficial effect	For example, land that has a very high contamination risk in the baseline becomes a low or very low risk. Land that meets the statutory definition of Contaminated Land in the existing baseline is no longer capable of being determined under Part 2A.

Potential mitigation

6.138 CLR11 sets out the approach to remediation of contaminated land. Remediation will need to address the relevant pollutant linkages, i.e. those that are presenting an unacceptable risk. The basic principles of remediation look to address the three elements of the pollutant linkage – the source, the pathway or the receptor: addressing one will break the pollutant linkage and therefore address the unacceptable risk:

- Removal or treatment of the source of contamination
either through physical excavation of soil or through treatment of the soil to render the contaminants safe
- Breaking the pathway
by leaving the contamination in situ but preventing exposure to or migration of the contaminants by the use of an engineered system to act as a barrier between the source and the receptors.
- Changing or modifying the receptor
such as changing from residential to a less sensitive land use such as commercial development

6.139 If the conclusion of the contaminated land risk assessment and impact assessment concludes that mitigation is required, then this will be specified through an appraisal of remedial options and the preparation of a remediation strategy. The approach to remedial options appraisal is to initially identify feasible remediation options by considering the applicability of a range of options and their potential to achieve the required standard of remediation. Once the best practicable technique has been confirmed, a remediation strategy can be prepared which will detail how the remedial works are to be carried out. For a development such as the WECC, it is likely that contaminated land risks would be addressed through a combination of source removal and/or engineered barrier solutions.

- 6.140 For mitigation of contaminated land risks and effects associated with construction methods, a CEMP will be prepared that will include requirements for pollution control, such as ensuring that fuels and oils are stored and used in accordance with best practice techniques.
- 6.141 Mitigation of contaminated land risks and effects associated with the operation of the power station, in terms of the introduction of potential new sources of contamination, will be afforded through the EP process and the requirement to demonstrate such issues are mitigated using the BAT.

The water environment

Overview

- 6.142 The development of land can have physical, chemical and biological effects on the water environment. Groundwater levels and flow regimes can be affected, for example by activities such as piling or the physical presence of the development and its foundations. Surface water flows and surface water volumes can change due to increases in impermeable areas and changes to site drainage systems. Flood risks can be affected by development and such effects can have implications within the wider catchment areas as well as localised effects. Changes in groundwater and surface water quality can also occur due to changes in the existing conditions on site, such as when existing pollutants are mobilised, or through the introduction of new pollutants, resulting in an increase in the pollutant loading of groundwater and surface water courses. Such changes in water quality can affect physical, chemical and biological water quality parameters. These changes in the water environment can occur during both the construction phase and when the development is operational.
- 6.143 Conversely, the water environment can have an effect on the development, for example the implications of flood waters for the design of building materials or aggressive groundwater conditions impacting on foundation materials.
- 6.144 NPS EN-1 requires that applications in Flood Zone 1 with an area above 1ha should be accompanied by a flood risk assessment (FRA). Details of the minimum requirements of the FRA are included at paragraph 5.7.5 of EN-1. Furthermore, EN-1 advocates early engagement with the EA and, where relevant, other bodies such as Internal Drainage Boards, sewerage undertakers, navigation authorities, highways authorities and reservoir owners and operators.
- 6.145 These discussions will aim to identify the possible extent and nature of any flood risk and inform the scope of the FRA. Consultation will be carried out with relevant authorities and where necessary reasonable measures to address concerns arising will be agreed.
- 6.146 This section of the scoping report sets out the proposed approach to the assessment of these water resource and water quality issues.

Study area

- 6.147 The study area for the water environment takes account of the proximity of surface water bodies, existing water quality and recent pollution incidents, the topography of the local area, the local/regional geology and hydrogeology, and water resources including groundwater and surface water abstractions.
- 6.148 The study area is taken as a 2 km radius from the WEC site and the gas and grid connection route corridors.

Existing information

Flood risk

- 6.149 The Welsh Government's TAN 15²⁷ provides guidance on whether a flood risk assessment (FRA) is required for development on a site. The objective of a FRA is to demonstrate that a proposed development is sustainable in flood risk terms. This means that the Wrexham Energy Site should not itself be at a significant risk of flooding, nor should its development result in an increased flood risk elsewhere.
- 6.150 The EA flood map²⁸ indicates that the WEC site does not lie within an area at risk of flooding from rivers and the sea. However the River Clywedog and Black Brook have flood risk areas that are crossed by both the grid connection corridor route options.
- 6.151 The site geology comprises glacial Till (40 to 60 m thick), and groundwater levels are within the Sherwood Sandstone Principal aquifer underlying this. Rest groundwater levels are circa 13.0 to 13.5 m below ground level. However, shallow perched groundwater is likely to be present with the glacial Till deposits and the presence of numerous surface water ditches and ponds within the locality indicates that it is likely that groundwater will be encountered within approximately 2 m of the surface. There is a potential for localised groundwater and surface water flooding and further assessment of the risk from flooding is therefore required.

Surface water and land drainage

- 6.152 The principal surface water courses are the River Dee approximately 2.2 km to the east of the site and River Clywedog approximately 1.3 km to the south. In addition, there are a number of ponds and surface water drainage ditches located within the proposed WEC site and on surrounding land. The River Dee is designated a Site of Special Scientific Interest and a Special Area of Conservation. The water quality of the River Dee to the east of the site is classed as Grade A Very Good for its chemical quality. The River Clywedog to the south of the industrial estate is classed as Grade B Good for its chemical quality. Surface water within the vicinity of the site and the route corridor for the grid connections is therefore of high environmental sensitivity.

27 Welsh Assembly Government. July 2004. Technical Advice Note (TAN) 15. Development and Flood Risk.

28 Environment Agency website flood maps [http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=338500.0&y=349500.0&topic=floodmap&ep=map&scale=8&location=Wrexham Industrial Estate, Wrexham&lang=_e&layerGroups=default&textonly=off](http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=338500.0&y=349500.0&topic=floodmap&ep=map&scale=8&location=Wrexham%20Industrial%20Estate,%20Wrexham&lang=_e&layerGroups=default&textonly=off)

- 6.153 Overland flows are currently believed to discharge to the drainage ditch located to the south east of the site that subsequently discharges to the River Dee. The site also has, in part, a surface water drainage system that discharges to the sewerage system serving the industrial estate. There is no data available at present on the volume, flow or quality of surface water run-off from the site.

Groundwater

- 6.154 The majority of the proposed scheme area does not overlie aquifers or groundwater source protection zones²⁹; the exceptions to this are summarised below.
- The WEC site is underlain by a Principal bedrock aquifer associated with the Kinnerton Sandstone of the Sherwood Sandstone Group;
 - A groundwater source protection zone (Inner, Outer and Total) lies approximately 1 km to the south of the power station site.
 - A superficial Secondary A aquifer associated with alluvial deposits is located approximately 1 km south of the WEC site. The eastern end of the grid connection corridors also crosses these areas.
 - The Legacy existing substation at the western end of the grid corridor lies approximately 500 m west of a superficial Secondary A aquifer and 750 m northeast of an Inner and Total groundwater source protection zone.

Potential effects

- 6.155 The development will potentially have an impact on flood risk, drainage and pollution levels and the potential effects to be considered are as follows:
- increased risk of overland flow flooding from excess surface water runoff generated because of the power station development particularly during the construction phase
 - the disruption of groundwater flow and the formation of preferential groundwater flow paths – Disruption will occur during the construction phase
 - increased risk of pollution and contamination of water features from surface water runoff and from groundwater
- 6.156 The presence of the River Dee, River Clywedog, their tributaries, the many drainage ditches and surface water ponds in close proximity to the WEC site and within the potential grid connection route corridors means that the locality is highly sensitive to surface water effects. The development will require management of surface water run-off and protection of surface waters during construction of the power station and its grid connections in accordance with pollution prevention guidance issued by the EA.
- 6.157 Perched groundwater within glacial Till deposits across the area has the potential to be in hydraulic continuity with surface water bodies and there is a potential for effects on surface water quality and risks of localised flooding through this perched groundwater. Perched groundwater will also be a consideration for the design of foundations, ground excavations and below ground structures that will be required for power station site, the gas pipeline connection and the pylon bases.

²⁹ Environment Agency website: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e Accessed 8 May 2012.

- 6.158 Deeper groundwater in the Principal and Secondary aquifers is less likely to be affected directly by the development proposals, although further detailed assessment is required in order to provide robust conclusions on any potential issues in this respect.

Assessment methodology

Flood risk assessment

- 6.159 The Flood Risk Assessment element will be prepared in accordance with TAN 15, EA standing advice, and following the guidance given in CIRIA Report Development and Flood Risk – Guidance for the Construction Industry.
- 6.160 TAN 15 requires that any development is consistent with policy in that it will not be at risk from flooding; and it will not exacerbate flooding elsewhere. A tiered approach to flood risk is recommended in the CIRIA report with three levels of assessment which are outlined below.

Level 1 - Screening study

- 6.161 This is designed to identify whether there are any flooding issues related to a development site which may warrant further consideration. A site visit is included in the Level 1 Screening Study to assess the site and surrounding area. The objectives of the screening study are to:
- develop an understanding of the potential flood risk to a development site; and
 - agree with the Local Planning Authority and relevant other consultees what aspects of flood risk would need to be addressed in a more detailed flood risk assessment
- 6.162 Following this preliminary assessment a detailed Level 2 Flood Risk Assessment will be completed to assess flood risk issues.

Level 2 - Scoping study

- 6.163 This will be undertaken if the Level 1 study indicates that the site may lie within an area which is at risk of flooding or that the site may increase flood risk due to increased runoff, to confirm the possible sources of flooding which may affect the site. The scoping study should include the following objectives.
- Assessment of the availability and adequacy of existing information
 - Qualitative assessment of the flood risk to the site, and the impact of the site on flood risk elsewhere
 - Assessment of the possible scope for appropriate development design and to scope additional work required; and
 - Consideration of ground levels, raised defences and SUDS (sustainable drainage and surface water management).

Level 3 - Detailed study

- 6.164 This will be undertaken if the Level 2 study concludes that a quantitative analysis is required to assess flood risk issues related to the development site. The detailed study should include:
- quantitative assessment of the potential flood risk to the development

- quantitative assessment of the potential impact of development site on flood risk elsewhere
- quantitative demonstration of the effectiveness of any proposed mitigation measures

The water environment EIA

- 6.165 The impact assessment for the water environment will be based on the following approach.
- Identify the existing water resource baseline conditions based on a full desk study review of available information from the EA and data obtained through site investigation at the power station site;
 - Understand and evaluate the areas that the regulatory authorities may wish to see a detailed assessment of the proposed redevelopment through consultation with WCBC and the EA;
 - Calculate the change in runoff contribution to the site due to the redevelopment and thereby assess the potential risk in terms of flooding;
 - Identify potential effects and effects with respect to the water environment and resources, in terms of effects on the volumes, flow and quality of water during construction, operation and eventual decommissioning/demolition of the power station site and its grid connections;
 - Identify the need for specific mitigation measures to protect the water environment which can be incorporated into the design of the proposals such as the development of a site drainage strategy, or through a CEMP such as the prevention of pollution of water during construction.
- 6.166 Assessment criteria will be used based on the methodology for appraising the impact of projects set out in the Department for Transport's (DfT) Transport Analysis Guidance (TAG) guidance on the assessment of the water environment³⁰. The methodology takes into account the importance, magnitude and significance of predicted effects on the water environment.
- 6.167 Table 9 defines the importance based on the value of the feature or resource.

Table 9: Importance of the environmental attributes of the water feature or resource

Importance	Criteria	Examples
Very High	Attribute with a high quality and rarity, regional or national scale and limited potential for substitution.	Aquifer providing potable water to a large population European Community. Designated Salmonid fishery.
High	Attribute with a high quality and rarity, local scale and limited potential for substitution attribute with a medium quality and rarity, regional or national scale and limited potential for substitution.	General Quality Assessment (GQA) Grade A reach of river. Aquifer providing potable water to a small population. Cyprinid or Salmonid fishery.

³⁰ Department for Transport. June 2003. Transport Analysis Guidance: The Water Environment Sub-Objective. TAG Unit 3.3.11. [online] Available from: <http://www.webtag.org.uk>.

Importance	Criteria	Examples
Medium	Attribute with a medium quality and rarity, local scale and limited potential for substitution attribute with a low quality and rarity, regional or national scale and limited potential for substitution.	GQA Grade B / C reach or river Aquifer providing abstraction water for agricultural or industrial use.
Low	Attribute with a low quality and rarity, local scale and limited potential for substitution.	Floodplain with limited existing development.

6.168 Table 10 defines the magnitude of a potential effect.

Table 10: Magnitude of potential effects

Magnitude	Criteria	Example
High	Results in loss of attribute.	Loss of EC designated Salmonid fishery Change in GQA grade of river reach Compromise employment source Loss of flood storage/increased flood risk Pollution of potable source of abstraction
Medium	Results in impact on integrity of attribute or loss of part of attribute.	Loss in productivity of a fishery Contribution of a significant proportion of the effluent in the receiving river, but insufficient to change its GQA grade Reduction in the economic value of the feature
Low	Results in minor impact on attribute.	Measurable changes in attribute, but of limited size and/or proportion
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use/integrity.	Discharges to watercourse but no significant loss in quality, fishery productivity or biodiversity no significant impact on the economic value of the feature No increase in flood risk

6.169 The significance of a specific potential effect is then derived by considering both the importance and / or sensitivity of the feature and the magnitude of the impact. Effects must be quantified where possible, also estimating the change from the baseline conditions and the range of uncertainty. The significance is determined using the risk matrix presented in Table 11.

Table 11: Criteria for assessing the significance of potential effect

Magnitude of potential impact	Importance / Sensitivity of attribute			
	Very High	High	Medium	Low
High	Very Significant Effect	Significant Effect	Moderate Significance	Low Significance
Medium	Significant Effect	Moderate Significance	Low Significance	Insignificant

Magnitude of potential impact	Importance / Sensitivity of attribute			
	Very High	High	Medium	Low
Low	Moderate Significance	Low Significance	Insignificant	Insignificant
Negligible	Low Significance	Insignificant	Insignificant	Insignificant

Potential mitigation

Flood risks

- 6.170 There are a number of measures available to mitigate and minimise the potential adverse effects during both the construction and operation phases of the development. The final design and construction programme are not yet known, but it is likely that a main mitigation recommendation would be for drainage and flood water management techniques to be built and made operational near the beginning of the construction phase. This would help to reduce the potential impact of all phases on flood risk.
- 6.171 For all new developments, consideration should be given to the potential for inclusion of some form of SuDS provision (sustainable urban drainage scheme). These management practices and control structures are designed to mitigate the increase in surface water runoff that can result from development, and hence reduce surface water flood risk. They also have the additional advantages of providing an opportunity to improve water quality, provide new habitats and increase the amenity value of the site.
- 6.172 Infiltration devices deal with runoff at the source by aiding infiltration. The WEC site is located in part within a Groundwater Source Protection Area (SPZ) as defined by the EA and there may need to be a constraint on the discharge of surface water runoff to groundwater stores. Furthermore, the underlying glacial till geology means that infiltration mechanisms for re-routing surface water may be ineffective and unsuitable. Storage and attenuation systems may therefore be more appropriate for the site. These control peak storm water, reducing peak flow and increasing event duration by storing water before it reaches the river system. Potential structures include ponds, retention basins and open swales to provide surface storage, and permeable paving and filter drains to provide subsurface storage.

Water quality

- 6.173 The mitigation of potential effects on water quality during construction would be based on best practice guidance as given in the Pollution Prevention Guidance notes (EA, Scottish Environment Protection Agency and Environment and Heritage Service, 2007), guidance by the Department of Transport (2006) and the Construction Industry Research and Information Association (CIRIA, 2006).
- 6.174 Potential mitigation measures during construction may include, but are not limited to the following:
- codes of best practice should be followed during all construction activities, especially when working close to water (see PPG and CIRIA [2005]). Depending on the specific construction activities on site, the relevant PPG should be consulted

- storage of materials should be controlled carefully according to codes of best practice. Oils and chemicals must be stored in suitable areas on stable, level and impervious surfaces using appropriate storage containers
 - stockpiled material should be placed away from water
 - storage of any loose material especially during wet weather should be carefully controlled
 - particular care should be taken when working with cement and concrete, materials which are highly toxic to the aquatic environment. A suitable area should be designated for washing concrete mixing plants
- 6.175 During the operation of the power station, the conditions set out within the Environmental Permit will ensure appropriate mitigation of potential effects that could be associated with aqueous discharges.
- The power station will have a dedicated foul and trade effluent drainage system that will discharge effluents to the sewerage system that already serves the industrial estate. Any discharges will be in accordance with discharge consent requirements relating to volumes and quality.
 - Surface water will be protected from the impact of potentially polluting substances through appropriate storage, transfer and handling of materials and liquids such as water treatment chemicals and lubricants/oils used for maintenance.
 - The power station will operate with appropriate permit conditions relating to how emergency situations are dealt with. This will include specified methods for dealing with accidental spills, leaks and incidents such as fires where there is a risk of polluting substances entering the water environment.

Ecology

Introduction

- 6.176 This section of the scoping report describes the existing ecological baseline of the proposed WEC site and the ecological issues within the potential route corridors for the gas and electricity grid connections. It makes recommendations for further detailed ecology and nature conservation surveys and assessments required to inform the EIA process.
- 6.177 NPS EN-1 states at paragraph 5.3.3 that 'Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity.'
- 6.178 Furthermore, paragraph 5.3.4 notes that applicants 'should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.'
- 6.179 The WEC site is partly previously developed brownfield land, and partly greenfield . As with many derelict brownfield sites, this part of the site has become re-naturalised to an extent over recent years. The WEC site has been the subject of a number of ecology surveys associated with previous development proposals for the

site, including a consented distribution warehouse. These have been updated in April 2012 for the specific purpose of WPL's proposals. At this stage, the route corridors have been the subject of a limited desk study review to identify key constraints in order to inform the development of options for the gas and grid electricity route corridors. It is acknowledged that more detailed desk study and survey work within these route corridors will be required to inform the development of the proposals and the EIA process going forward.

Study area

- 6.180 The study area for the ecological impact assessment will take account of the land and water habitats that will be directly affected by the development proposals such as through land take, and indirectly affected such as could occur if there were changes in water quality/flows of local water courses and their tributaries. The study area will also take account of protected species and species of nature conservation value that could be affected directly or indirectly by the development proposals, including the behavioural requirements of fauna such as foraging, feeding, nesting, breeding, migrating etc.
- 6.181 The study area will be 30 km for Special Areas of Conservation (SACs and candidate SACs) where bats are a consideration, 2 km for Natura 2000 sites and 1 km for non-statutory sites and protected/notable species.

Existing information - Wrexham Energy Centre site

Existing ecology reports and studies

- 6.182 A number of existing surveys are available for the WEC site; these are listed in Table 12 below. These documents have been reviewed to provide an understanding of the current baseline conditions. The 2005 and 2008 reports supported the application that was consented in May 2010 for B2/B8 development on the WEC site.

Table 12: Existing reports for the Wrexham Energy Centre site study area

Survey/Species	Report
Extended Phase 1 Habitat Survey	MRB Ecology and Environment, Land East of Bryn Lane, Wrexham - Extended Phase 1 Habitat Survey, September 2008
Great crested newt	DAW Ltd, Bryn Lane, Wrexham - Great Crested Newt Survey and Mitigation Strategy (ref: 080261), August 2008.
	Whitcher Wildlife Ltd, Bryn Lane, Wrexham – Great Crested Newt Survey (ref: 091225), June 2010.
Bats	DAW Ltd, Bryn Lane, Wrexham - Bat Survey and Mitigation Strategy (ref: 080261), August 2008.
	Whitcher Wildlife Ltd, Bryn Lane, Wrexham - Bat Survey, June 2010
Water vole	Surveys for Water Vole (<i>Arvicola terrestris</i>) were also carried out by Derek A. Whitcher Ltd during site visits in 2005 and in 2008 for other protected species.
Reptiles	Survey data for 2011 reptile surveys by SKM Enviros.

Survey/Species	Report
Birds	Whitcher Wildlife Ltd, Bryn Lane, Wrexham – Bird Census and Mitigation Strategy (ref: 080261), August 2008.
Lesser silver water beetle, dingy skipper and grizzled skipper	Marches Ecology, Bryn Lane, Wrexham. Industrial Estate – Ecological Surveys (ref: C070/Draft Kingmoor Park), August 2008.

Desk study

- 6.183 Details of designated sites and notable habitats were acquired from internet-based resource MAGIC (Multi Agency Geographical Information for the Countryside) and the CCW website.
- 6.184 The sites and habitats included in the scoping study are:
- internationally designated sites, including SACs, SPAs, and Wetlands of International Importance (Ramsar sites)
 - nationally designated sites, including SSSIs
 - locally designated sites, including LNRs
 - Habitats listed under the Natural Environment and Rural Communities (NERC) Act 2006. The list including 56 habitats and 943 species is the definitive reference for all statutory and non-statutory bodies involved in operations that affect biodiversity in Wales
- 6.185 The scoping area extends up to 2 km from the WEC site. Information on ecologically sensitive sites and habitats was sought from within this area. Dependant on the designation and notable features, sites and habitats information was compiled for scoping area zones within 500 m and 2 km of the application site according to Table 13 below.

Table 13: Study areas for the Wrexham Energy Centre site

Ecological Feature	Desk study distance for search from application site boundary
SAC, SPA, Ramsar site	2 km
SSSI, LNR	2 km
Habitats of Principal Importance	500 m

- 6.186 The existing survey data for the application site has been reviewed and the relevant information extracted and presented in the following sections. Any amendments to the baseline conditions as a result of a recent walkover survey will also be made.

Walk-over survey

- 6.187 A walk-over Ecology Survey was undertaken of the WEC site on 4th April 2012 by an experienced ecologist to update the extended Phase 1 Habitat Survey completed in 2008. The survey broadly followed the 'extended Phase 1' methodology set out in Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment, 1995). The survey aimed to confirm that the habitats

present have not changed significantly since the extended Phase 1 habitats survey in 2008 (MRB Ecology and Environment, Land East of Bryn Lane, Wrexham - Extended Phase 1 Habitat Survey, September 2008) and identify any additional constraints. With respect to legally protected species, in this instance based on existing knowledge of the site, this included searching for the following ecological features.

- Potential roosting sites for bats, particularly in trees on the WEC site or immediately adjacent. These were inspected from the ground and given a rating of bat roosting potential from negligible to high (or confirmed evidence of bats). The 2008 survey did not record the specific locations of trees with potential for bats as the majority of mature oak trees on site had moderate to high potential for bats. Furthermore, an arboricultural survey of the application site has been undertaken showing the locations of all the trees on the application site. Therefore, the locations of individual trees with bat potential were not recorded during the 2012 walkover survey
- Suitable habitat for water voles, otters and white-clawed crayfish within watercourses within the application site or immediately adjacent. This includes the watercourses along the eastern and northern boundaries of the site, and the watercourse within the application site, to the western side.
- Signs of badger activity including setts, tracks, snuffle holes and latrines within the application site boundary. It was not possible to access land to the north and east of the site (primarily due to boundary obstacles i.e. watercourses), but it is noted that these areas are potentially suitable for badger. The land to the east is also under alternative ownership and permission for access may be required. There was also no access to survey the Norbert Dentressangle landholding to the south of the application site. However, a badger sett is very unlikely in this area
- An assessment of the quality of habitat, including Habitat Suitability Index (HSI) assessment, of the waterbodies within the application site for great crested newts. This species is known to be present on site and therefore the search has not been expanded to include ponds within 500 m
- Habitat with potential to support reptiles
- Suitable habitat for dormice. The application site is likely to be outside the northerly range for dormice and there is no broadleaf woodland in close proximity to the site. However, the potential for dormouse was assessed within hedgerow/scrub associated with field boundaries within and immediately adjacent to the application site
- The potential for important invertebrate assemblages to be present within the application site
- The potential for notable flora was recorded; and
- The presence of invasive plant species, in particular Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, rhododendron and Himalayan balsam. These are invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and are subject to strict legal control

6.188 The existing survey data provides sufficient information about habitat suitable for breeding birds within the application site. Therefore, provided the habitat has remained relatively unchanged, this was not recorded in detail during the survey.

- 6.189 Ecological surveys are limited by factors which affect the presence of plants and animals, such as the time/season of year and the migration patterns and behaviour of animals. Consequently, the walkover of the application site has not produced a complete list of plants and animals; however, it is considered that the results of the walkover survey undertaken have allowed for the identification of the habitats, the potential presence of legally protected species and other valued ecological features and resources within the survey area.

Desk study and survey results

Designated sites

- There are no internationally important designated sites within 2 km of the application site.
 - There are no nationally important SSSIs within 2 km of the application site.
 - There are no locally important LNRs within 2 km of the application site.
- 6.190 According to records from COFNOD within the existing desk study, there is an Adopted Wildlife Site (AWS) within 1 km of the WEC site, located to the south west on the opposite side of Bryn Lane. This site, known as Wrexham Industrial Estate AWS, is approximately 505 m from the WEC site and could potentially be affected by the works. Further survey work will be needed to determine the exact location and nature of the AWS so that any potential effects can be assessed and, if appropriate, reduced or prevented.
- 6.191 A further two AWS sites are located between 1 km and 2 km from the WEC site, both to the south-west of the site, in or on the edge of Wrexham Industrial Estate. Given the distance from the application site (i.e. over 1 km), it is highly unlikely that these AWSs will be affected by the proposed development. However, the final route of the gas and electricity grid connection corridors may have implications for these sites and therefore identification of the nearest (and potentially affected) sites will be considered within the EIA.
- 6.192 There are no Habitats of Principle Importance located within 500 m of the application site (based on search of MAGIC data set for UK Biodiversity Action Plan (BAP) priority habitat areas).

Protected and notable species

- 6.193 Records of protected and notable species within 1 km of the WEC site were requested from COFNOD and are listed in Appendix 5 of the 2008 Extended Phase 1 Habitat Survey Report (MRB Ecology and Environment, 2008).
- 6.194 The records indicate the presence of the following protected species: great crested newt, otter, whiskered bat, common pipistrelle and a pipistrelle bat (species not given), slow worm, badger and adder.
- 6.195 The records also indicate the presence of the following notable species including Section 42 (NERC), UK BAP and LBAP species.
- Moths - latticed heath, cinnabar, figure of eight, shaded broad-bar; and
 - Dragonflies and damselflies – brown hawker, banded demoiselle, azure damselfly, blue-tailed damselfly, emerald damselfly, broad-bodied chaser, migrant hawker, common darter, large red damselfly.

Habitats

- 6.196 The WEC site primarily comprises improved grassland, semi-improved neutral grassland, a brownfield site comprising bare ground with a mosaic of ephemeral short-perennial, tall ruderal, and marshy grassland. Scattered broadleaved trees, scrub and hedgerow are associated with field boundaries. Small areas of amenity grassland are present along the access road to the Norbert Dentressangle site in the south-western corner of the site. Other habitats present within the application site include a large area of hard standing to the western side. There are a number of waterbodies across the site with associated aquatic and marginal vegetation. Two watercourses are also present. One runs along the eastern boundary of the site, the other runs along the majority of the northern boundary and through the western section of the application site. The watercourses meet in the north-eastern corner of the application site (refer to appendix 4 for Phase 1 Habitat Survey Plan).
- 6.197 The surrounding habitats included improved grassland to the north and east of the site, the operational distribution depot of the Norbert Dentressangle site to the south, and Bryn Lane and the wider Wrexham Industrial Estate to the west.

Protected species

- 6.198 The following legally protected species are potentially present on the site: great crested newts, bats, reptiles and birds. As outlined in the 2008 extended Phase 1 Habitat Survey report³¹, pre-application discussions between the applicant for the existing permissions for B2/B8 development and CCW (we have no date or record of this correspondence) also highlighted the potential for the site to support notable invertebrates. Surveys were required to determine the presence/absence of lesser silver water beetle (*Hydrochara caraboides*) and to assess the habitat quality for two species of butterfly; grizzled skipper (*Pyrgus malvae*) and dingy skipper (*Erynnis tages*). These surveys were undertaken by Marches Ecology in 2008³².
- 6.199 The following paragraphs outline the survey results to-date for the species listed above. Water vole was surveyed for but not found and there was no evidence of badger using the WEC site.

Great crested newts

- 6.200 The most recent survey of the application site was a population size class assessment undertaken in 2010 by Whitcher Wildlife Ltd. The site has also historically been surveyed in 2005 and 2008. Results taken from the 2010 surveys show that within the consented B2/B8 application site (Plot 2) there are four ponds (Ponds H, K, J and P), three of which contained great crested newts (Ponds H, J and P). Refer to Figure 7 showing the location of these ponds reproduced from the earlier surveys.

³¹ MRB Ecology and Environment, Land East of Bryn Lane, Wrexham - Extended Phase 1 Habitat Survey, September 2008.

³² Marches Ecology, Kingmoor Park, Bryn Lane, Wrexham Industrial Estate – Ecological Surveys, Sept 2008 (ref: Co70).

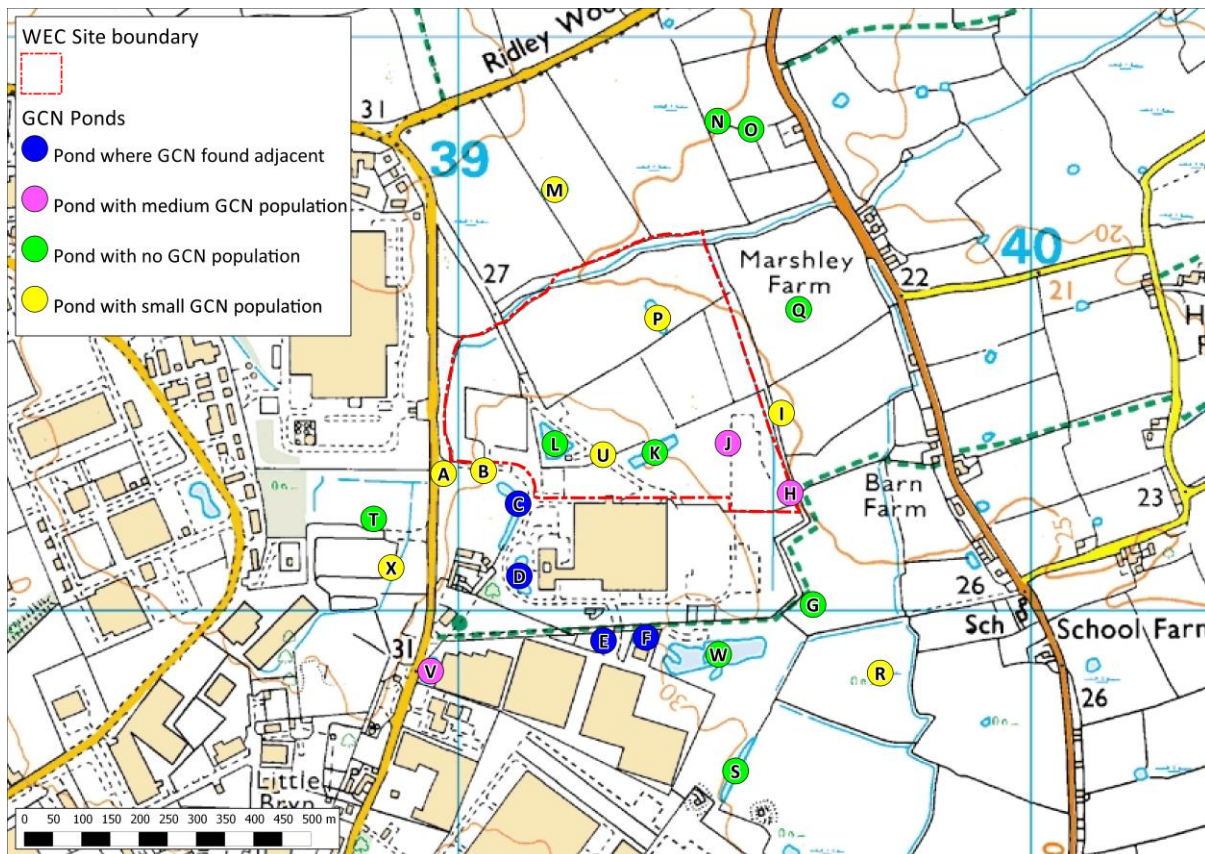


Figure 7: Great crested newt ponds surveyed. Reproduced from figures in 2005 and 2008 reports (© Crown copyright, license number 100024244 Savills (L&P) Limited)

- 6.201 Two additional ponds were recorded within the application site in 2008 (Ponds L & U) but were excluded from the 2010 survey with the following *justification* “ponds that had previously contained no great crested newts for a specific reason and where circumstances remained the same were omitted from this survey”.
- 6.202 Of the ponds within the application site, Pond J held a medium population of great crested newts, whilst Pond H and P had small populations.
- 6.203 An additional 19 ponds in the surrounding area were also included in the 2010 survey by Whitcher Wildlife Ltd. The distance between these ponds and the current application site (Plot 2) has not been accurately measured, but most appear to be within 500 m of the site boundary and have suitable habitat links to the site, and would, therefore, need to be considered during the development of mitigation measures for the site. Ponds A, B, C, I, M, V, 1, 3, 4, 5, 7 and 8 contained small populations of great crested newts, Pond R contained a medium population, and no great crested newts were found in ponds D, E, F, X, 2, or 6. Lettered ponds are shown on Figure 7 above. There are no plans indicating the locations of numbered ponds, but photographs and descriptions are given in the 2010 great crested newt survey report (Whitcher Wildlife Ltd, Bryn Lane, Wrexham – Great Crested Newt Survey (ref: 091225), June 2010).

- 6.204 Table 14 below (refer to Whitcher Wildlife Ltd, Bryn Lane, Wrexham – Great Crested Newt Survey (ref: 091225), June 2010 report for full details).

Table 14: Great crested newt survey results (2010)

Location (with reference to Plot 2)	Survey Result	Pond Reference (from Whitcher Wildlife Ltd, Bryn Lane, Wrexham – Great Crested Newt Survey (ref: 091225), June 2010)
Onsite	Present	H, J, P
	Not recorded	K
Offsite (within 500 m)	Present	A, B, C, I, M, R, V, 1, 3, 4, 5, 7, 8
	Not recorded	D, E, F, X, 2, 6

Bats

- 6.205 A bat survey of the site was undertaken by Whitcher Wildlife Ltd in 2008. The surveys involved searching for potential roost sites and recording bat activity on the site. Bat activity was recorded by undertaking emergence/activity surveys and through the use of Anabat detectors. The 2008 walkover of the site identified the presence of a number of mature trees, mostly oak, with potential for bat roosts. As the trees were to be retained under plans for the B2/B8 development on the WEC site and an arboricultural survey undertaken, the location and potential of individual trees was not recorded within the report. It was concluded that there is high potential for bats to roost in mature oak trees on the application site.
- 6.206 The pattern of bat activity over the application site did not identify any concentration of any one species that would indicate the presence of a roost. The pattern of activity indicates predicted foraging activity along hedgerows and over ponds on the site where a concentration of insects would be expected.

Reptiles

- 6.207 A reptile survey of the WEC site was undertaken in 2011 by SKM Enviros. A total of 61 tins or artificial refuges were placed on the site on 5th April 2011 and two survey visits were undertaken on 12th April and 10th May 2011. No reptiles were recorded. Toads were incidentally recorded during the surveys. A formal survey report has not been produced for this survey as it was suspended; only notes from the two visits made are available.

Birds

- 6.208 A survey of the bird species present on site was undertaken in August 2008 by Whitcher Wildlife Ltd³³. The survey did not follow British Trust for Ornithology (BTO) Common Bird Census methodologies due to the late timing of the survey. However, the survey was thought to be appropriate to indicate the range of species present on the application site.
- 6.209 The bird survey identified six amber listed Birds of Conservation Concern (BoCC): kingfisher, swallow, dunnoek, mute swan, mistle thrush and goldcrest. The kingfisher is also a Schedule 1 species.

³³ Whitcher Wildlife Ltd, Bryn Lane, Wrexham – Bird Census and Mitigation Strategy (ref: o8o261), August 2008.

- 6.210 The other species recorded include: blackbird, mallard, moorhen, wren, crow, jackdaw, magpie, whitethroat, goldfinch, swift, robin, greenfinch, chaffinch, collared dove, tawny owl, chiffchaff, blackcap, sparrow hawk, wood pigeon and common buzzard.
- 6.211 The 2008 survey found that generally species were present in the hedgerows and trees on the site. No birds were seen over the open fields unless they were species like swallow feeding for insects or crow and magpie seen flying over the site.

Lesser silver water beetle

- 6.212 A single visit was undertaken to each of the four ponds within Plot 3 and the adjacent Plot 1 on 13 August 2008 by Andy Harmer, Marches Ecology. The presence/absence survey was carried out under CCW licence OTH:SA:353:2008.
- 6.213 The survey found the ponds occurring in the application site (Plot 2) i.e. Ponds 1-3, to be unsuitable for lesser silver water beetle. Pond 4 was assessed as being potentially suitable, but this is located outside the application site. The locations of the pond are shown on the Lesser Silver Water Beetle Pond Plan, Appendix C (Ponds 1-3 are also shown on Figure 7 above as Ponds K, L & P respectively).

Dingy skipper and grizzled skipper

- 6.214 The 2008 survey by Marches Ecology for dingy skipper and grizzled skipper was undertaken outside the main flight period (first or second week of May up to the start of July for North Wales) and therefore concentrated on assessing the potential quality of the habitat for these species. This assessment was based on the particular habitat preferences of the two species including presence of egg-laying and larval-host plants.
- 6.215 Within the application site, the available habitat that is suitable for both target species of butterfly is more-or-less restricted to the brownfield land in the south-eastern corner. This area is approximately indicated by TN 2, 4 & 5 on the Phase 1 Habitats Plan, appendix 4. Much of this area can be considered of moderate or high potential value for both species. Most of the remaining area of the application site is not suitable for either species.

Invasive plant species

- 6.216 No invasive plant species were recorded on site during the 2012 survey.

Baseline description for the connection corridors

- 6.217 Currently, two potential route corridors for each of the gas and electrical connections are being considered. Studies of ecology within the route corridors for the gas and electricity grid connections will be undertaken as the proposals are developed. Both the gas and electricity connection routes will pass through countryside comprising arable land and pasture with well-defined boundaries of hedgerows and trees, and with numerous ponds and small wooded areas. The grid connection route corridors would potentially traverse part of the River Dee SSSI where the route option follows the existing overhead power lines, and passes within 100 m of other designated sites such as the Johnstone Newts Special Area of Conservation.

- 6.218 These route corridors could include a wide variety of sensitive flora and fauna including bats, badgers, birds and other protected species. The selection of the preferred routes and alignment within will take account of these and potential significant effects for ecology and nature conservation will be assessed within the EIA.

Potential effects

- 6.219 The following section outlines the potential issues that may need to be addressed in relation to the development of the WEC site and based on the existing information. A detailed impact assessment and comprehensive mitigation strategy will be required as part of the EIA, once a detailed development proposal has been produced and provided the ecological baseline is up-to-date.

Wrexham Energy Centre site – construction stage

Effects on designated sites

- 6.220 There are unlikely to be any effects on areas covered by international or national designations for nature conservation as none were identified within 2 km of the application site.
- 6.221 Wrexham Industrial Estate AWS is located approximately 505 m south-west of the WEC site on the western side of Bryn Lane. Although there will be no loss of habitat, the AWS could be indirectly affected by the development of the application site. Further work will be needed to determine the potential effects of the development on this AWS, as well as other AWS sites that may be present within the route corridors of the gas and electricity grid connection, so that any potential effects can be predicted and, if necessary, prevented.

Effects on habitats of principal importance

- 6.222 There are unlikely to be any effects on Habitats of Principal Importance as none were identified within 500 m of the application site.

Effects on protected and notable species

- 6.223 The development works, including vegetation removal and earthworks, could result in killing, injury or disturbance of great crested newts. Great crested newts are known to breed in ponds on site and therefore great crested newts will be present in the surrounding terrestrial habitat. The development will potentially result in loss of one or more of the breeding ponds. Similarly, dingy skipper and grizzled skipper and reptiles, for which the site has suitable habitat, will also be affected if present.
- 6.224 There are a number of mature tree on site with potential to support roosting bats. If these trees are directly affected by works, then bats could be killed and roost sites destroyed. Works may indirectly affect the long-term health of these trees, which would also affect any bats roosting in the trees. Bats can also be affected by disturbance and works close to the trees at times when the roost is occupied, particularly at night, can disturb bats in the roost and affect their usual behaviour. Furthermore, the hedgerows/field boundaries on site will be used by bats for foraging and commuting. If the connectivity is severed bats may not be able to reach feeding sites from the roost and may locally affect the favourable condition status.

- 6.225 The clearance of trees, scrub and the loss of open grassland will result in a loss of habitat for nesting birds. The construction works may disturb birds on the nest resulting in abandonment if undertaken at the inappropriate time of year and without caution.
- 6.226 The works may cause noise or visual disturbance of notable animals using habitats on or adjacent to the application site, including the presence of construction staff, machinery, and lighting.

Wrexham Energy Centre site – operational stage

- 6.227 The day to day activity on site will be carried out in accordance with the requirements of the site Environmental Permit which will be issued and monitored by the Environment Agency. This permit will include measures relating to the management and control of emissions to air, land and water to meet specified limits. Key to the mitigation of potential impacts on ecology will be aspects within the Environmental Permit such as the surface water management plan that will control potential polluting discharges to water courses.

Effects on designated sites

- 6.228 Potential effects on statutorily designated sites for nature conservation as a result of SO_x and NO_x depositions during the operational life of the power station will be considered. Full account will be taken of the assessment and findings of the air quality section of the EIA.

Wrexham Energy Centre site – decommissioning and demolition stage

- 6.229 Decommissioning and demolition of the power station and its grid connections would have similar potential impacts on ecology and sites of nature conservation value as during construction. The works could cause disturbance to protected species such as nesting birds, bats and great crested newts, result in the loss of important habitats, present a risk of pollution, or otherwise adversely affect species or habitats that may continue to exist or have become newly established in the locality.

Assessment methodology

- 6.230 In order to provide a robust supporting document to accompany the ES and planning application, the following surveys and assessments are recommended. It will also be necessary to undertake an ecological impact assessment to determine whether the predicted effects are likely to be significant in terms of the ecological features and resources that are identified.

Desk study

- 6.231 The existing desk study, including the MAGIC search undertaken as part of this ecology scoping report, is sufficiently detailed for the purposes of the ecological impact assessment for the WEC site. The existing data on ponds within 500 m of the WEC site boundary will be reviewed and checked against Ordnance Survey maps. This information will be required for any great crested newt development licence application.
- 6.232 Whereas a preliminary desk study has been undertaken to identify statutory sites of ecological importance within 2 km of the proposed route corridor options, it is recognised that a full desk study will be required for the gas and electricity grid

connections. The desk study will be undertaken in accordance with the current best practice guidance on ecological effects assessment and in particular the Institute of Ecology and Environmental management's Guidelines for Ecological Impact Assessment³⁴. The study area for connection route corridors will comprise:

- 30 km for SACs and candidate SACs where bats are one of the qualifying species;
- 2 km for Natura 2000 sites (SACs, SPAs, Ramsar sites, nationally important statutory sites of nature conservation importance, such as SSSIs; and
- 1 km for non-statutory sites of nature conservation importance and protected or notable species.

Wrexham Energy Centre site - protected species surveys

Great crested newt

6.233 Great crested newt surveys were undertaken at the WEC site in 2005, 2008 and 2010. This existing survey information is sufficient to submit a draft development licence application to CCW in order to obtain a 'letter of comfort' to be submitted with the ES/planning application as part of the application process. Further great crested newt surveys will be required in the appropriate season to provide current data to support the great crested newt development licence application to CCW once development consent has been obtained. Under the current scheme programme, population size class assessment surveys for great crested newts at the WEC site can be undertaken from March 2013.

Reptiles

6.234 The habitat on the WEC site has potential for reptiles. Given that records for slow worm and adder were identified in the desk study and only two survey visits were undertaken in 2011 survey, further survey is recommended. Current IEEM guidelines state that seven site visits are required to establish the likely absence of reptiles from a site. If reptiles are identified on application site, additional visits (up to 20) will be required to determine the population size of the species present.

Bats

6.235 Provided none of the mature trees with high potential for bat roosts within the application site are going to be affected by the proposed development, then no further surveys for bats are recommended at this time.

6.236 If it is necessary to perform tree works on or fell any of the mature trees on the application site, then a detailed inspection for bats and if necessary emergence surveys must be undertaken.

Badger

6.237 No evidence of badger was recorded on the application site during surveys in 2008 and 2012. However, badger is a very mobile species and there are records of this species within the surrounding area, it is therefore reasonable to undertake further survey work. Evidence of this species will be searched for within the application

³⁴ Institute of Ecology and Environmental Management. 2006. Guidelines for Ecological Impact Assessment in the United Kingdom.

site and up to 50 m from the boundary (access permitting) during subsequent survey.

Otter, water vole and white-clawed crayfish

- 6.238 The 2008 survey did not record potential habitat for otter and white-clawed crayfish. The watercourses and waterbodies were re-assessed during the 2012 site visit.
- 6.239 Otter has been recorded in the surrounding area according to local biological records. Although otter could use the watercourses on site to commute and forage as part of a wider territory, the likelihood that otter would be present along the watercourse adjacent to the application site is low. This is owing to the small size of the watercourses, the absence of suitable features that could provide resting sites for otter and the limited foraging that they are likely to provide.
- 6.240 Water vole surveys were undertaken in 2005 and 2008 and no evidence was found. The watercourse along the eastern boundary of the application site was a narrow channel choked with vegetation. It has some potential to support water vole, due to the availability of bank sides for burrowing and some food-plant species. The watercourse along the northern boundary had no potential for water voles due to heavy shading and no aquatic vegetation. Some of the larger waterbodies (TN 9 & 15, refer to Phase 1 Habitats Plan, appendix 4) within the application site also have potential to support water vole and this species should be considered when assessing potential effects and mitigation. Re-survey for water vole may be required once the detailed development proposals and the potential impact upon watercourses and waterbodies are known.
- 6.241 The watercourse to the north provides habitat potentially suitable for white-clawed crayfish. The over-hanging bank and areas of stony substrate provide potential in-stream refuge sites. It is suspected that the water quality is too poor for this species, but it is not possible to rule out their presence without further survey. It is recommended that a further survey be carried out if the watercourse is going to be affected by the development works. This further survey should initially involve a detailed habitat suitability assessment of the whole watercourse by an ecologist with crayfish experience.

Lesser silver water beetle, dingy skipper and grizzled skipper

- 6.242 CCW should be consulted with regard to the requirement for updated specialist surveys for lesser silver water beetle, dingy skipper and grizzled skipper. The validity of existing lesser silver water beetle data will be confirmed with CCW; however further survey and assessment may be required. Further surveys for dingy skipper and grizzled skipper are likely to be required. The existing survey data is over three years old and although potential habitat, which has remained unchanged, was identified for these butterflies, they were not recorded on site during the survey.

Connection route corridors - protected species surveys

- 6.243 Surveys for protected species will follow the recommended methodology in current best practice guidelines. The scope, extent and timing of further surveys, particularly with regards to the grid connection route corridors will be agreed in consultation with CCW.

Nature conservation evaluation criteria

- 6.244 The impact assessment will be based on a standard methodology (Guidelines for Ecological Impact Assessment in the United Kingdom, IEEM, 2006).
- 6.245 In order to determine the significance of effects, a nature conservation value will be assigned to ecological features that may potentially be affected by the development of the application site identified during the desk study or field surveys. The assessment will use accepted criteria as a means of determining the value of a defined area of land which are set out in A Nature Conservation Review (Ratcliffe, 1977), and include attributes such as diversity, rarity and naturalness. In urban areas, the Ratcliffe criteria are often expanded to bring in 'social criteria' such as wildlife corridors, accessibility to the public, presence or absence of other green spaces in the local area (Natural Assets: non-statutory site of importance for nature conservation, Collis & Tyldesley, 1993). The evaluation will also take into account existing designations, assigned biodiversity value, and potential value.
- 6.246 Following IEEM (2006) guidelines, the valuation will assess the importance of the feature in a geographic context on the following scale:
- International;
 - National;
 - Regional;
 - County;
 - District ;
 - Local (parish); or
 - Negligible.
- 6.247 In general, habitats and species will be evaluated together in the geographic context. If a particularly valuable species is identified at the site, then this may be evaluated separately.

Impact assessment methodology

- 6.248 The assessment of the potential effects of the proposed scheme will take into account both on-site effects and those that may occur to adjacent and more distant ecological features. Effects can be positive or negative. Negative effects can include:
- Direct loss of wildlife habitats;
 - Fragmentation and isolation of habitats;
 - Disturbance to species from noise, light or other visual stimuli;
 - Changes to key habitat features;
 - Changes to the local hydrology, water quality and/or air quality.
- 6.249 Negative and positive effects on nature conservation features will be characterised based on predicted changes as a result of the proposed activities. In order to characterise the effects on each feature, the following parameters will be taken account of:
- The magnitude of the impact;
 - The spatial extent over which the impact would occur;
 - The temporal duration of the impact;

- Whether the impact is reversible and over what timeframe;
 - The timing and frequency of the impact.
- 6.250 Positive and negative effects will be identified that would be 'significant', based on the integrity and the conservation status of the ecological feature. Effects are unlikely to be significant where features of local value or sensitivity are subject to small scale or short-term effects. However, where there are a number of small scale effects that are not significant alone, it may be that, cumulatively, these may result in an overall significant impact.
- 6.251 The integrity of 'defined' sites, described below, will be used in this assessment to determine whether the effects of the proposals on a designated site are likely to be significant:
- The integrity of a site is the coherence of the ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.
- 6.252 The conservation status of habitats and species within a defined geographical area, described below, will be used in this assessment to determine whether the effects of the proposals on non-designated habitats and species are likely to be significant:
- For habitats, conservation status is determined by the sum of influences acting on the habitat and its typical species, that may affect its long term distribution, structure and functions as well as the long term survival of its typical species within a given geographical area; and
 - For species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long term distribution and abundance of its population within a given geographical area.
- 6.253 In addition to determining the significance of an impact on any ecological features, the Ecological Impact Assessment (EclA) will also identify any legal requirements for mitigation measures or policy implications. This refers to policies as set out in LDPs and/or Local Development Frameworks.

General mitigation

- 6.254 All the mitigation proposals below will be supported and supervised by the presence of an ecological watching brief throughout the main construction phases of the works. A Construction Environmental Management Plan will be designed to ensure that methods of best practice are followed and all recommended mitigation measures will be discussed and agreed with CCW.

Designated sites

- 6.255 Where the development has the potential to impact on a designated site, following consultation with CCW and other relevant stakeholders, suitable measures may include careful timing of construction works. A screening assessment on the effects of potential effects on European designated sites by the proposed development will be undertaken where necessary which will provide information to assist the competent authority in deciding whether an Appropriate Assessment under the Habitats Regulations Assessment will be required. This will also identify any requirements for further surveys or mitigation measures.

Notable habitats

- 6.256 Based on current knowledge and design, the development proposals will avoid, as far as possible, more sensitive habitats such as woodland and wetland habitats. Mitigation in relation to temporary loss of habitats during construction will include habitat reinstatement using an appropriate species mix. Measures to protect more sensitive habitats, such as marshy grassland and watercourses, in close proximity to construction working areas will also be adopted.

Protected and notable species

- 6.257 There is potential for the WEC to have a temporary impact on great crested newts, and if so, mitigation measures would have to be agreed. This is most likely to take the form of excluding them from the working corridor. In order to do this a licence will be required from CCW for any works that would result in an otherwise unlawful activity such as damage to a great crested newt breeding site.
- 6.258 The habitat mosaic of field boundaries, hedgerows and farmland provides suitable habitat for badgers, so consequently some disturbance to badgers could arise during the construction phases of the proposed works. Where the working area is within 30 m of any badger setts, appropriate measures to limit disturbance will be undertaken. A CCW licence may be required if works are carried out close to an active sett or in any way considered to be detrimental to badgers.
- 6.259 There may be a temporary impact to reptiles resulting from the proposed works. Suitable mitigation measures will be adopted to reduce or minimise these effects. Appropriate measures may include exclusion fencing or, if the population is found to be sufficiently large, relocation to an alternative suitable habitat away from the area of works. A fingertip search prior to any vegetation clearance will also be undertaken.
- 6.260 The habitats provide suitable foraging and roosting habitat for bats. If any trees or buildings with potential to support roosting bats need to be removed, suitable mitigation will be provided.
- 6.261 In addition to special consideration will be given to birds that may be using the River Dee SPA/SSSI. There may be effects on breeding birds as a result of the proposed works. Measures to minimise disturbance to breeding birds will include removal of any vegetation. This will be undertaken outside the bird breeding season (early February to end August). If this is not possible, an ecologist will check the area for nesting birds 24 hours prior to commencement of works.
- 6.262 Liaison with CCW will be undertaken in relation to mitigation of effects on the lesser silver water beetle, dingy skipper and grizzled skipper. Where there are potential for direct effects and loss of habitat, measures such as the translocation and habitat creation will be considered.
- 6.263 Where vegetation is removed due to construction, replanting programmes will use native species from seed banks of local provenance. Any opportunities for habitat creation to improve the nature conservation value of the site will also be explored. Particular emphasis will be given to improve habitats for protected species. Habitat translocation methods will be utilised if species rich habitats are affected by the proposed WEC. In areas that previously consisted of introduced or ornamental species, native planting will be prioritised, while also considering the surrounding landscape character.

Landscape and visual

Introduction

- 6.264 This section presents the proposed approach to the landscape and visual assessment of the proposed WECC development, including the associated grid connection infrastructure. It includes a discussion of baseline conditions, preliminary identification of likely significant effects, sets out the proposed impact assessment methodology for consideration of the construction and operational phases of the scheme, and identifies potential requirements for mitigation.
- 6.265 Paragraph 5.9.5 of NPS EN-1 indicates that the following should be included in an assessment of the landscape and visual effects:
- include reference to any landscape character assessment and associated studies as a means of assessing landscape impacts relevant to the proposed project
 - take account of any relevant policies based on these assessments in local development plans
 - include the effects during construction of the project and the effects of the completed development and its operation on landscape components and landscape character
 - the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity
 - this should include light pollution effects, including on local amenity, and nature conservation
- 6.266 In addition to this, paragraph 2.6.4 of EN-2 requires that 'The applicant should also consider the design of the plant, including the materials to be used, and the visual impact of the stack, as set out in Section 5.9 of EN-1 in the context of the local landscape.'
- 6.267 The scoping stage of the assessment will determine the nature and extent of the likely significant effects of the scheme on the existing landscape resource and visual receptors. The following landscape resources and visual receptors will be considered:
- Physical landscape features and elements;
 - Landscape character (including designated landscapes); and
 - Views and visual amenity experienced by residents, recreational users (including visitors and tourists) and road users.
- 6.268 The nature of landscape and visual effects is closely related to other topics such as ecology, cultural heritage and arboriculture. Each of these topics can influence the landscape character of an area, or will contribute to the importance and sensitivity of landscape or visual receptors. The scope of the LVIA has been developed in accordance with these topics.
- 6.269 Principles and good practice for undertaking landscape and visual assessment are set out in the Landscape Institute (LI) and the Institute of Environmental

Management (IEMA) 'Guidelines for Landscape and Visual Impact Assessment'³⁵, (GLVIA). Alongside this best practice document, the methodology for the EIA will also be developed in accordance with the Countryside Agency (now Natural England) and Scottish Natural Heritage 'Landscape Character Assessment Guidance'³⁶.

Study area

- 6.270 The study area in relation to landscape character and the approximate visual envelope (VE) to address significant visual effects has been established. For the WEC site this can be broadly defined by the following:
- to the north, by the low level plateau of landform and associated vegetation structure between Borrass Head and Holt,
 - to the east, by the low lying ridgeline, east of the River Dee, broadly between Crewe-by-Farndon and Shocklach,
 - to the south, the low lying floodplain west of the River Dee around Cross Hands,
 - to the west, by the eastern urban edge of Wrexham
- 6.271 For the electricity and gas connections, the study area is defined by the following:
- to the north by the complex interactions between landform and vegetation along the southern valley top of the River Clywedog;
 - to the east, by the fringe farmlands on the eastern edge of the industrial estate;
 - to the south, by the physical boundary of the B5462 between Bangor on Dee and Rhosllanerchrugog; and
 - to the west, by the physical boundary of the B5426.
- 6.272 The suggested locations for proposed viewpoints that would be used as representative views in the assessment have also been identified (Drawing 5105324-WRX-ENV-003-RevB at appendix 5). This information will be used to form the basis of detailed consultation with the relevant landscape officer at WCBC and to agree these viewpoints as part of the EIA.
- 6.273 The study area has been established through reference to OS plans and aerial imagery. This has enabled a wide area of study to be determined to guide subsequent field work and site based appraisal (as described above). An initial site visit was undertaken as part of this scoping exercise in order to better understand the context and character of the landscape and verify the preliminary findings of the desk study.
- 6.274 The preliminary desk study included reference to landscape designations and constraints relevant to the scheme within the wide area of study. This stage also looked at planning policy and landscape character studies (detailed below). Reference documents include:
- OS Explorer Maps 256 (Wrexham/Wreccsam & Llangollen) and 257 (Crewe & Nantwich);

³⁵ Institute of Environmental Management (IEMA). 2002. Guidelines for Landscape and Visual Impact Assessment (GLVIA).

³⁶ Countryside Agency (now Natural England) and Scottish Natural Heritage. 2002. Landscape Character Assessment Guidance.

- Aerial imagery;
 - WCBC website (www.wrexham.gov.uk);
 - Wrexham Unitary Development Plan (2005);
 - Landscape character guidance: LANDMAP Website (<http://landmap.ccw.gov.uk>); and
 - Landscape character guidance: Natural England NCA's (NCA 61).
- 6.275 This was followed by site survey work which refined the potential VE and further informed the scoping of issues. The site survey work was undertaken in April 2012 in order to see the site and area before vegetation was in full leaf (and therefore closer to the worst case winter scenario).

Baseline description

- 6.276 Wrexham Industrial Estate is located approximately 2 km to the east of the urban edge of Wrexham and the WEC site is situated off Bryn Lane and the eastern edge of the estate. Beyond the industrial estate, to the north, east and south, the landscape is predominantly rural and influenced by the low lying floodplain and river terraces associated with the River Dee (the river is located approximately 2.2 km to the east of the site).
- 6.277 The scheme includes the construction of connections to the existing electricity and gas networks. The broad corridors for these components of the scheme leave the site and sweep around the southern edge of the industrial estate, crossing the River Clywedog, continuing west to the south of Marchwiell and Rhosytllen.
- 6.278 Seasonal constraints are a key limitation for landscape and visual assessment. It is likely that the EIA will be progressed through the summer period and more detailed site survey work will be undertaken when existing vegetation cover provides the highest level of screening (i.e. in full leaf). Supplementary survey work can then be undertaken in the final stages of the development of the proposals during the winter months at any locations where this is considered necessary. The EIA will use professional experience and judgement to assess and predict the nature and duration of potential effects during a winter scenario. The EIA chapter on landscape and visual effects will set out the predicted effects during winter.
- 6.279 Effects on the setting of designated heritage assets are not included in the scope of this LVIA; these are addressed in Cultural Heritage section of this scoping report and will also be taken forward in a separate chapter of the ES. There will be close liaison between the technical disciplines during the assessment process.
- 6.280 This section includes reference to the sensitivity of existing trees and woodland and the anticipated direct effects of the scheme; however, this will focus on the tree and woodland areas as a landscape elements and/or features that contribute to the character of the area and will not form a technical arboricultural implications assessment.
- 6.281 A separate Arboricultural Report will also be included as an Appendix to the ES. This will present the findings of the tree survey and arboricultural implications assessment in accordance with BS5837:2005 Trees in Relation to Construction.
- 6.282 The arboricultural assessment will also include a tree protection plan showing construction exclusion zones, root protection areas (which will be useful in terms of designing spoil disposal), and protection measures to be used during the

construction such as fencing, tank matting or boards to prevent compaction and the use of arboricultural method statements. The results and conclusions (including recommendations for mitigation) of the arboricultural survey will also be considered as part of the baseline position for the landscape and visual assessment.

Potential effects

Key components of the scheme

- 6.283 The key components of the scheme likely to generate potentially significant effects would be during the construction and operational stages. These issues will be investigated further during the EIA process.
- 6.284 During construction, landscape and visual effects will be caused by the following:
- Site clearance and removal of vegetation in accordance with the proposed layout and footprint of the scheme;
 - Presence of construction plant, including high level features such as cranes;
 - Vegetation clearance, soil stripping and excavation along the linear corridors for the electricity and gas connections;
 - Construction of pylons and overhead power lines, including foundations and cranes for construction of transmission towers; and
 - Associated vehicle movements.
- 6.285 Some of these aspects will be temporary, such as the presence of construction plant. Others are likely to result in permanent physical changes (effects) to the landscape, particularly changes to character through loss of vegetation but mainly through the introduction of the larger buildings and chimney stacks on the fringe of the industrial estate.
- 6.286 These changes will also result in visual impact through intrusive construction works, for example plant machinery and HGVs during the construction phases.
- 6.287 During operation, potential effects could arise in connection with the following:
- Permanent presence of key building elements would include turbine buildings, HRSG buildings, cooling system and chimney stacks;
 - Visible steam plume from the cooling system;
 - Permanent presence of other, smaller ancillary buildings and infrastructure (for example, power station control room, offices, stores and water treatment plant and internal road layout);
 - Ground reinstatement of the construction corridors for the gas connections and the permanent presence of overhead power lines; and
 - Establishment of landscape mitigation measures.

Potential effects

- 6.288 Landscape assessment is the systematic description and analysis of the physical features and elements of the landscape, how their composition forms distinct areas of character, appraisal of the importance and the potential effect of development proposals on the landscape. The elements may include landform, field and settlement patterns, building styles, historical and cultural elements, road and transport patterns, vegetation cover and land use,

6.289 Visual amenity assessment is the description and analysis of the views experienced by receptors from residential properties, public buildings, public open spaces, public rights of way, open access areas, transport corridors and places of work, and the potential effect of development proposals on the receptors.

6.290 Following a review of the landscape and visual information related to the scheme, the following potential issues have been identified.

Local policy context

6.291 The current development plan for Wrexham is the Wrexham Unitary Development Plan which was adopted in February 2005. The policies of the development plan relevant to landscape and visual matters in relation to the site and the scheme include:

- Policy EC1 – Green Barrier;
- Policy EC5 – Special Landscape Area;
- Policy EC7 and EC8 – Conservation Areas; and
- Policy T10 – Walking/Cycling Route.

6.292 WCBC also has guidance on Tree Preservation Orders, a Tree and Woodland Strategy document and links to the Welsh landscape character assessment (LANDMAP). Further investigation of these baseline documents would be undertaken for the main EIA.

Landscape character

6.293 LANDMAP is the formally adopted methodology for landscape assessment in Wales and all assessments of the effects arising from a proposal's impact on the landscape should include LANDMAP as part of their baseline conditions. The LANDMAP methodology is promoted in Planning Policy Wales (2002) (as amended) and is supported by TAN12 on Design.

6.294 The LANDMAP definitions are relevant in terms of defining the factors that contribute to landscape character; they enable the character to be described in relation to the sense of place and distinctiveness of an area as well as noting the references to quality, condition, value and sensitivity.

6.295 LANDMAP will be considered in relation to the visual and sensory aspect areas and reference will be made to the aspect areas that are relevant to the study area. This will be included in the scoping report so as to determine the level of detail required at the EIA stage.

6.296 Opportunities to enhance the landscape character of the site and surrounding can be addressed throughout the design process, including consideration of the following:

- that the development is sympathetic to the surrounding area, the inherent nature of the scheme is a constraint, however consideration can be given to quality and suitability of materials and finishes;
- the protection of key landscape features such as trees and woodland and other vegetation cover from disturbance during construction; and
- the incorporation of key landscape features and management of existing features or details within the development is important e.g. creation of hedgerows,

additional planting of native woodland (contributing to green infrastructure), traditional walls and materials in peripheral areas of the site etc.

- 6.297 Physical landscape effects are likely to be generated by the construction phases of the development. These processes have the potential to adversely affect the existing vegetation structure that is currently a component on the site; changes to vegetation as a result of the electricity and gas connections will have the potential to influence character of a wider area due to the linear nature of these connections. Furthermore these routes will pass through areas of more sensitive character than the rural agricultural landscape that characterises the River Dee floodplain.
- 6.298 The introduction of the proposed internal layout and buildings would be a new and detracting feature in the landscape. The perceived effects of these physical changes on the character of the landscape would not significantly alter the character of the area (due to the existing use of the surrounding areas) however due to its location on the periphery of the industrial estate, without appropriate treatments (through mitigation) it would become a more prominent feature and detract from the surrounding rural landscape. The scheme will have some degree of positive influence due to the potential for screening existing views of the adjacent Kellogg's plant which is an older and more complex industrial feature that is prominent in views from the east.
- 6.299 Although the site is located in Wales and LANDMAP will be the primary source of baseline information for landscape character, the study area is likely to extend further east beyond the River Dee and into England. Reference will be made to Natural England's character guidance at a national level; this includes reference to NCA 61 Shropshire, Cheshire and Staffordshire Plain.

Visual effects

- 6.300 Visual amenity assessment is the description and analysis of the views experienced by receptors from residential properties, public buildings, public open spaces, public rights of way, open access areas, transport corridors and places of work, and the potential effect of development proposals on the receptors. Visual receptors subject to potential effects will include:
- Settlements and the scattered individual properties and farmsteads to the east of the site, beyond the River Dee and up to the low ridgeline between Holt and Shocklach;
 - Public rights of way in this same area;
 - The eastern fringe of Wrexham town;
 - The rolling countryside between the southern edge of Wrexham and the B5426, including rights of way and settlements/properties such as Marchwiel, Eyton and Sontley (this will establish effects in the corridor for electricity connections);
 - Assets and designations to the south of Wrexham including National Trust land/properties, the Erddig Country Park, Wat's Dyke and the Country Park at Rhosllanerchrugog.
- 6.301 It should be noted that some long distance views of the scheme are likely to be available, particularly from the south and east.
- 6.302 It is suggested that visual effects will be assessed in the main EIA for the following stages of development:

- During construction in winter – the construction period has not yet been confirmed, but assessment on the winter period will present the worst case scenario;
- Immediately following completion in winter and summer; and
- Year 15 following completion in summer.

Assessment methodology

6.303 The assessment of landscape and visual effects for the EIA will include the capture, recording and presentation of a selection of representative viewpoints from identified receptors. The assessment will be further informed by reference to existing landscape character studies, relevant landscape designations and also planning policy relevant to landscape matters.

6.304 The methodology for the landscape and visual assessment will be developed in accordance with the GLVIA. The GLVIA defines landscape and visual effects as follows:

“Landscape and visual assessments are separate, although linked, procedures...”

“Landscape effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced. This may in turn affect the perceived value ascribed to the landscape....”

“Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people’s responses to the changes, and to the overall effects with respect to visual amenity”.³⁷

6.305 The assessment will examine the existing baseline conditions and potential effects during the life of the scheme and any remaining residual effects following the implementation of mitigation proposals. In order to establish the degree of impact the assessment will establish the baseline conditions through a process of detailed desk study and site survey.

Desk study and site survey

6.306 The desk study will identify potentially sensitive landscape resources (e.g. land use, character and value) by reference to OS maps and existing landscape character studies, including LANDMAP. A more detailed identification of potentially important and sensitive visual receptors such as footpaths, other rights of way, and residential properties will be undertaken for the full EIA.

6.307 Site survey work will be undertaken to confirm and identify key public rights of way, residential properties, public highways and other public amenity areas that contribute to the landscape character of the area or could have potential views of the proposed development.

6.308 The survey work will contribute to an understanding of the existing landscape character and the location and nature of visual receptors, and will supplement the available information collected during the desk study. The site survey will also establish the nature and likely effects of the potential mitigation measures.

³⁷ Paragraph 2.13 to 2.15, Page 12, GLVIA, (2002)

- 6.309 A series of representative photographs will be captured during the site visits. The method for capture and presentation of photographs will be in accordance with LI Advice Note 01/2011 ('Photography and Photomontage in Landscape and Visual Assessment')³⁸. Each viewpoint will be accompanied by a table and a location plan and will include the following:
- a description of the location (receptor);
 - the approximate distance from the viewpoint to the application site boundary;
 - a location map of the viewpoint;
 - a description of the existing view and the components of the predicted view during development;
 - descriptions of magnitude of impact and landscape sensitivity;
 - description of mitigation measures and the likely effect of these; and
 - a summary of the significance of the potential impact (adverse or beneficial).
- 6.310 The assessment methodology will also set out the process for the prediction of landscape and visual effects and the appraisal of their significance through the construction and operational phases of the scheme. This will include an assessment of the sensitivity of the agreed viewpoints and the use of illustrative material to assess the impact of the scheme on each view as well as sensitivity of other key visual receptors where viewpoints cannot be obtained.
- 6.311 The establishment of thresholds of effect significance is recognised as a valid way of standardising the conclusions of the landscape and visual assessment. The effect significance will depend not only on the magnitude of the change but also on the sensitivity of the location or receptor. Each of these terms will be defined.

Table 15: Landscape and visual effects - issues for EIA

Issue	Effects to be investigated further in EIA	Proposal for EIA
Effects on landscape character	Baseline landscape character and changes to this.	Assess nature and degree of change to the baseline landscape character.
Physical effects on the landscape	Changes to specific landscape elements or features that give rise to changes in character but are also recognisable importance themselves (for example, loss of woodland or hedgerows).	Identify landscape elements and features and assess design proposals to establish extent of losses and potential for avoidance through mitigation.
Visual effects	Physical changes to the landscape that give rise to changes in the view and/or amenity of views from and to the landscape.	Identify sensitive visual receptors and assess the nature and degree of change to the baseline position.

³⁸ Landscape Institute. 2011. Advice Note 01/2011 Photography and Photomontage in Landscape and Visual Assessment

Potential mitigation

6.312 An outline of the potential measures to mitigate landscape and visual effects arising from construction and operational phases of the scheme is set out below. These preliminary measures will be considered during the assessment work, and, where possible, will be incorporated into the ongoing design and development of the final preferred option for the scheme.

Avoidance and reduction

- Avoid loss of vegetation through adaptation of the layout, working in consultation with ecology and arboricultural specialists, to minimise the area of trees and vegetation to be lost to the proposed development through consideration of options, for example this could be achieved through amendments to the footprint of the scheme;
- Where night time lighting is required (including temporary lighting used during construction) then this should be designed to minimise effects through careful siting of columns, and the use of the latest specification luminaires to minimise glare and light spill;
- Reduce potential visual effects through consideration of architectural styles, appropriate materials and finishes to built development; and
- Reduce visual impact through considerate construction; including proposals for advanced landscape works and proposed short and long term maintenance which would protect and enhance the longevity of the existing vegetation structure where this can be retained (and therefore their screening value).

Replacement

- Replacement of lost trees and vegetation where required – replacement of trees and shrubs should be undertaken through a programme of replanting using native and locally prevalent species. The replacement planting should provide links to existing habitats and also integrate visually with the surrounding landscape elements and character, replacement planting should also aim to re-establish an appropriate woodland edge to newly exposed edges of woodland. Locally occurring plants should be used in the species selection to ensure that planting is sympathetic to the setting and to improve biodiversity, stock used should be of local provenance, mechanisms for advanced ordering and procurement of local provenance seed / planting stock should be investigated to try and secure local provenance stock from the site or locality; and
- Surveys of existing trees and woodland will inform the approach to retention and protection of existing trees and provide a strategy for replacement planting. This will also inform the aftercare and long term management of existing and retained trees and woodland so as to ensure the long term viability and security of landscape and ecological mitigation proposals.

Noise and vibration

Introduction

- 6.313 The proposed WEC has the potential to give rise to noise and vibration effects during the construction and operation of the facility and due to traffic, especially heavy vehicles, accessing the site via the local road network. This section provides an initial review of potential construction and operational noise and vibration effects which will be assessed in detail.
- 6.314 NPS EN-1 requires the noise assessment to include:
- a description of the noise generating aspects of the development proposal leading to noise impacts, including the identification of any distinctive tonal, impulsive or low frequency characteristics of the noise
 - identification of noise sensitive premises and noise sensitive areas that may be affected
 - the characteristics of the existing noise environment
 - a prediction of how the noise environment will change with the proposed development
 - in the shorter term such as during the construction period
 - in the longer term during the operating life of the infrastructure
 - at particular times of the day, evening and night as appropriate
 - an assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas; and
 - measures to be employed in mitigating noise
- 6.315 Paragraph 5.11.5 of EN-1 also requires that the potential noise impacts of other elements of the proposal, such as increased road traffic, are also considered.
- 6.316 The potential noise and vibration effects associated with the decommissioning and demolition of the facility are likely to be comparable to those during construction, and these issues will be given further consideration during the development of the proposals to ensure that opportunities to mitigate these potential effects through appropriate design are fully considered.
- 6.317 The development site proposed for the power station is on the eastern periphery of Wrexham Industrial Estate. The site is bounded to the west by Bryn Lane, beyond which the land use is largely industrial and commercial in nature. A Kellogg's manufacturing complex is located on Bryn Lane opposite the site and has been identified as a noise source contributing significantly to the noise climate of the local area through usage of plant on site and air abatement equipment positioned on the roof. The Kellogg's site is operational 24 hours a day.
- 6.318 The development site consists of brownfield land and greenfield land. Several fields are situated immediately north and east of the site with further industrial premises, namely a large logistics warehouse and distribution centre, to the south. Ridley Wood Road intersects the fields to the north, running east-west, and forms a junction with the B5130 to the north east of the site. The B5130 is approximately 280 m from the eastern boundary of the overall proposed site and is where a

sparsely populated residential area is located. A school is also located on the B5130, approximately 420 m to the south east of the site's eastern boundary.

- 6.319 The majority of the noise sensitive receptors are close to the B5130, the nearest being approximately 270 m from the perimeter of the overall site area. Further buildings at the junction of Bryn Lane and Ridley Wood Road have also been identified as having the potential to be affected by the CCGT power station. The closest residential building is 240 m from the site boundary on Bryn Lane.
- 6.320 Within route corridors for the gas and electricity grid connections, there are numerous sensitive receptors that could be affected by noise and vibration during construction of the gas pipeline and the pylon bases for overhead electricity cables.

Study area

- 6.321 The study area for the noise and vibration assessment will comprise the closest noise sensitive receptors to the power station and will consider a 1 km radius from the WEC site.
- 6.322 For construction noise, a study area to identify noise sensitive receptors within 500 m either side of the gas and grid connection corridors will also be evaluated. For noise associated with traffic emissions, the study area will be defined on the basis of changes in traffic as determined by the Transport Assessment.

Baseline description

- 6.323 For the WEC site, a baseline noise survey was conducted in April 2011 by SKM Enviro to establish the current noise climate in the vicinity on a typical weekday. Noise levels at noise sensitive locations on Bryn Lane and the B5130 (Park Cottage, Barn Cottage and Yewtree Villa / School) were assessed during the day and at night using the measurement methodology outlined in BS 4142:1997 'Method for rating industrial noise affecting mixed residential and industrial areas'. The survey measured the broadband ambient (LAeq,T)³⁹, background (LA90,T)⁴⁰ and maximum (LAF,max)⁴¹ noise levels at each of the surveying positions. Frequency data was also collected for the ambient and maximum noise levels in octave bands.
- 6.324 The previous noise measurements surveys will be supplemented by an additional survey to identify changes in the noise climate due to new developments in this area since the survey was completed and to establish baseline noise levels during a typical weekend.
- 6.325 The previous noise monitoring survey report indicates that noise from the Kellogg's facility, most likely from air cooling plant equipment, is dominant across the development site at all hours of the day and night with occasional contributions of mobile plant or impulsive noise events from the other adjacent industrial and commercial uses, from road traffic on Bryn Lane and, to a lesser extent, Ridley Wood Road. The industrial noise contributions are also audible, but not dominant, at the properties along the B5130, to the east of the proposed development site.

³⁹ LAeq,T is the constant noise level over the time period T, which contains the same acoustical energy as the actual time varying noise level

⁴⁰ LA90,T is the statistical noise level that is exceeded for 90% of the time during measurement period T.

⁴¹ LAF,max is the maximum noise level during a given measurement period with the meter time weighting set to 'fast'.

Potential effects

- 6.326 The main sources of noise that could change the noise characteristics of the area local to the power station site are temporary short-term construction activities and traffic, permanent long-term changes to traffic once the WEC is operational, and noise from the CCGT facility itself. Some construction methods that could be employed, such as piling, could give rise to vibration effects.
- 6.327 Within the route corridors for the gas and electricity grid connections, the main sources of noise would be the temporary short-term construction activities and traffic. There is also a potential for short term vibration effects depending on the methods of construction employed.
- 6.328 Due to the temporary nature of construction activities, residual construction noise and vibration effects (remaining after mitigation) are likely to be reduced in terms of the assessed significance. The construction method should be agreed (as required) with WCBC before the commencement of the works and appropriate mitigation measures should be employed during the works.
- 6.329 The main potential sources of noise associated with the operation of the WEC would be the gas turbines and the HRSGs, and to a lesser extent the cooling plant. The facility will operate 24 hours a day 7 days a week and therefore night time noise would be the main potential issue particularly for noise sensitive residential receptors. There would be limited traffic associated with the day to day operation of the power station. The turbines and HRSG will be housed in buildings with acoustic insulation, which could be attenuated to ensure that noise limits are met, and routine maintenance plans for the equipment would seek to ensure that the plant operates without undue noise or vibration generation. It is expected that with the use of appropriate mitigation measures, most long-term (operational) noise and vibration effects would be mitigated or greatly minimised.
- 6.330 It is possible that the WEC may provide screening to some properties on the B5130 that would reduce the current impact of noise from the Kellogg's facility. However, a noise benefit would only be realised in this area if the noise contribution from the WEC is less than the reduction from screening noise propagating from Kellogg's. This will be considered further within the noise impact assessment.

Assessment methodology

Noise survey

- 6.331 A noise survey will be undertaken to inform the assessment of effects associated with the power station site. Noise measurements will be conducted using a noise logger to collect continuous data in 5 minute increments at a fixed position for one week, with additional measurements at selected noise sensitive locations. The noise survey will therefore record noise baseline levels during the day and at night, during the week and at weekends.
- 6.332 The extent and methodology of the noise surveys will be determined in consultations with the WCBC.

Construction noise and vibration

- 6.333 The extent to which construction noise and vibration could affect the noise sensitive areas is influenced by the baseline ambient noise level, the hours of work, the duration of site operations, usage of equipment, the type of construction activities

- that will be undertaken, the location of the residential areas concerned in relation to the site, and the characteristics of the principal sources of noise at the construction site.
- 6.334 Appropriate noise limits will be proposed, in consultation with WCBC, and the effects of development during the construction phase will be determined by considering exceedances of these limits.
- 6.335 The potential adverse effects of noise and vibration at the noise sensitive receptors arising from the construction phase of development will be assessed using the methodology and guidance provided in BS 5228-1:2009 'Code of practice for noise and vibration control on construction and open sites'.
- 6.336 Where appropriate, generic source noise data published in the British Standard will be used for noise calculations of construction-related activities if no information for the specific machinery involved is available.
- 6.337 The traffic on Bryn Lane and other roads close to the site could increase during the construction of the WEC as building materials and construction vehicles arrive on site. An assessment of noise and vibration from construction traffic and vehicle movements will be required using the baseline noise levels either using the methodologies outlined in Annex F of BS 5228-1 or the Calculation of Road Traffic Noise (CRTN)⁴² if traffic data is available for the local road network. Effects are expected to be greater on routes where there are currently low levels of traffic and these will be assessed at residential properties and other noise sensitive receptors.
- 6.338 Adverse vibration effects would not be expected at distances beyond around 75 m even from the highest vibration-inducing construction activities. As the nearest residential building is 240 m from the boundary of the site, it is therefore not expected that vibration will be an issue at any of the identified sensitive receptors. Further consideration will be given however, to the potential effects of vibration on the neighbouring business premises.

Operational noise and vibration

- 6.339 The potential for noise complaints would be assessed in accordance with BS 4142, which requires a comparison between the predicted noise level resulting from the operation of the CCGT development and the existing baseline background noise LA90 at the noise sensitive receptors. The predicted 'specific' noise level, an LAeq measure, will be used to calculate a rating level, LAr,t that takes into account the character of the noise sources and a reference time period for daytime and at night. Complaints about noise are unlikely if the noise from the equipment is more than 10 dB below the background levels, and it is of marginal significance if the noise levels are 5 dB above background.
- 6.340 As the WEC is to operate 24 hours a day, a night-time BS 4142 assessment will be required as this will be the most noise sensitive time period at residential locations. The rating level will be determined by taking measurements at a similar facility to obtain indicative noise levels or calculations based on the site layout and sound power levels for the equipment and processes that will be used.
- 6.341 An acceptable operating noise limit and difference between the rating level in BS 4142 and the LA90 will be agreed, in consultation with WCBC.

⁴² Department of Transport and Welsh Office (1988). 'Calculation of Road Traffic Noise', HMSO, London.

- 6.342 An initial screening study to assess the impact on the local road network will be conducted using the methodology and guidance in the DMRB⁴³. Traffic data, including flows, speeds and percentage of heavy vehicles using each road, will be required to model this. A sensitive receptor study will be completed if changes in road traffic noise greater than 1 dB(A) are predicted. The causes of significant changes in noise level will be identified and noise mitigation suggested where appropriate.
- 6.343 Adverse vibration effects would not be expected at distances beyond around 75 m even from the highest vibration-inducing construction activities. As the nearest residential building is 240 m from the boundary of the site, it is therefore not expected that vibration will be an issue at any of the identified sensitive receptors.

Decommissioning and Demolition

- 6.344 The effects during decommissioning and demolition are likely to be comparable to those during construction, with the potential for noise and vibration from plant and equipment to impact on sensitive receptors, as well as noise from road traffic.

Significance criteria

- 6.345 The effects of construction noise and traffic noise would be assessed against the existing ambient noise levels and the following criteria used to classify the effects:-
- 1 to < 3 dB(A) change - PERCEPTIBLE impact
 - 3 to < 5 dB(A) change - SLIGHT impact
 - 5 to <10 dB(A) change - MODERATE impact
 - ≥10 dB(A) change - SUBSTANTIAL impact
- 6.346 The operational noise effects would be assessed against the significance criteria of BS 4142. The greater the difference between the rating noise level and the background noise level, the greater the likelihood of complaints. A difference of around + 10 dB or more indicates that complaints are likely. A difference of around + 5 dB is of marginal significance. If the rating level is more than 10 dB below the measured background noise level then this is a positive indication that complaints are unlikely.

Potential mitigation

- 6.347 Where the assessment indicates there may be significant noise effects at particular locations during the construction or operational phase, mitigation measures would be examined. This could include traffic routes to and from site, the choice or design of plant and equipment to be installed at the facility and used to construct it, or the general layout of the site.
- 6.348 The design and positioning of the operational plant processes will take into account the need to minimise noise emissions. This is likely to include the use of silencers on fan and vent inlets and outlets, localised enclosures and reduction of noise breakout from buildings housing noisy processes by selection of appropriate building materials for the facades and roof together with noise attenuated ventilation

⁴³ Highways Agency & other regional agencies (2008). 'Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7: Noise and Vibration'.

inlets/outlets. Furthermore, noisy activities, particularly if they are partially enclosed or not enclosed permanently, would be sited away from noise sensitive receptors.

- 6.349 The connections and mechanical couplings between different items of machinery or processes (e.g. between the generator and the gas or steam turbine) would be treated to avoid noise generated by vibrating equipment.

Transport and traffic

Introduction

- 6.350 NPS EN-1 notes at paragraph 5.13.3 that 'if a project is likely to have significant transport implications, the applicant's ES should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport guidance, or any successor to such methodology.'
- 6.351 Furthermore, EN-1 requires that details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts are provided (paragraph 5.13.4)
- 6.352 The WEC site is located on the eastern side of the Wrexham Industrial Estate. It is accessed from Bryn Lane, a high standard two lane road which serves as the outer ring road of the industrial estate. Bryn Lane is connected to the recently opened Wrexham Industrial Estate Northern Access Road; a new dual carriageway that now links the industrial estate to the A483(T) to the north. Also the new Southern Access Road links the industrial estate to the A525 to the south. Both the Northern and Southern Access Roads now provide the industrial estate, and hence the WEC site, with good links to the strategic highway network.
- 6.353 The construction and operation of the WEC will generate traffic and this could potentially have an environmental effect on transport users of the local highway network. The main effects would be during construction as a result of abnormal loads, general construction heavy goods vehicles (HGVs) and construction worker traffic. During the operation of the power station, traffic would be limited and more typical of that of other non-distribution industrial facilities within the locality, with occasional deliveries of goods and maintenance supplies and the commuting traffic associated with plant operatives.
- 6.354 Traffic emits pollutants to air and creates noise - these will be considered separately in the assessment of the effects of the development proposals on air quality and noise including other relevant receptors on transport routes. Traffic associated with a new development can cause temporary disruption to or have a longer term effect on the physical capacity of the local highway network and any need to increase capacity or otherwise mitigate such effects will be the subject of a detailed Transport Assessment prepared in consultation with the highway authorities.

Study area

- 6.355 A Transport Assessment scoping report will be prepared in accordance with DfT guidance⁴⁴ and consultation held with the relevant highway authorities on the both the scope of the assessment and study area. This will be based on a consideration of the trip generation, distribution and modal share aspects of the development proposals including construction trips and routes which are not known at this stage. The study area will comprise the local road network at the industrial estate, the new Wrexham Industrial Estate Access Roads recently constructed for connecting the industrial estate to the A483 and A525, cycle and pedestrian routes in the locality and the public transport network serving the WIE.

Baseline information

- 6.356 The highway infrastructure within the Wrexham Industrial Estate comprises the following:
- Bryn Lane forms the outer ring road of the industrial estate in the vicinity of the WEC site and is a two lane road approximately 7.3 m wide with grass verges. In the vicinity of the site, Bryn Lane is straight with a north – south alignment but curves to the west around the northern extent of the industrial estate where it then joins the newly opened Northern Access Road. It is subject to a 40 mph limit. The road has a predominantly urban characteristic with other large developments on Bryn Lane including the Kellogg's factory opposite the WEC site and a number of large distribution and warehousing facilities.
 - The Northern Access Road links the industrial estate at Bryn Lane to the A483(T) to the north west at Wrexham. The Northern Access Road comprises 3.2 km of two-lane dual carriageway with three at-grade roundabout junctions. The Southern Access Road comprises 1.2 km of single carriageway to connect the industrial estate to the A525 to the south west. The objectives of the Northern and Southern Access Road schemes were:
 - to give direct access to the industrial estate to support economic development;
 - to deliver environmental benefits for residents on local minor roads by the removal of through traffic, in particular at Llan-y-Pwll, Cross Lanes and Hugmore Lane;
 - to deliver road safety benefits, particularly on the section of the A534 at Llan-y-Pwll and Hugmore Lane; and
 - to create a commodious route around the east side of Wrexham.
 - The A483 is effectively the western bypass for Wrexham and is a high quality grade separate dual carriageway providing the locality with access in a north-easterly direction to Chester, the M53, and M56 to destinations such as Liverpool, Manchester and the north of England. In a south-westerly direction the A483 gives access to North and Mid Wales and the Midlands.
 - The A525 links Wrexham with Whitchurch to the south east and gives access to Shrewsbury, Telford and Mid Wales, and the M6 and M54 routes in to the Midlands.

⁴⁴ Guidance on Transport Assessment. 2007. Department for Community and Local Government and Department for Transport (DCLG & DfT).

- 6.357 A Transport Assessment for the WECC development proposals has not been undertaken at this stage and a key consideration for the determination of traffic effects will be the predicted traffic on the newly constructed Wrexham Industrial Estate Northern and Southern Access Roads. However, the WEC site has the benefit of planning permission for a large B2/B8 development for which a Transport Assessment⁴⁵ was undertaken in 2008.
- 6.358 The 2008 Transport Assessment reports that there are no footways on Bryn Lane in the vicinity of the WEC site and there are very few residential properties within 1.5 km of the site so that walking is unlikely to be a realistic option for journeys to work. It identifies that in Wrexham Town there is an extensive network of cycle routes which connect the industrial estate with the surrounding area and there are a number of conventional bus services that run to and from the town centre. However, the Transport Assessment reports that the modal share for trips of those travelling to work in the Holt ward (which includes the industrial estate) is dominated by travel by car as the driver (78.5%) and travel by car as a passenger (12.8%).

Potential effects

- 6.359 The key traffic and transport issues to be considered will be those during construction of the WEC:
- The construction work is likely to take 3 years with approximately 1,200 construction workers per day at its peak. During the peak construction period, work will typically be six days a week between 07:00 to 19:00 hours. Assuming 90% of workers travel to the construction site by shared car or private minibus, the numbers of vehicle movements could be in the region of 450 movements twice a day during peak construction.
 - HGVs will visit the site daily during construction. These can generally be timed to minimise the impact on the local highways and traffic. During peak construction, there could be between 5-10 HGV movements an hour throughout the working day.
 - Abnormal loads will be required for importing some of the larger elements of the CCGT to the site such as the boilers. The number of abnormal loads will be dependent on the technology provider, their chosen method of delivery and assembly, route constraints and consultations and agreements reached with the highway authorities.
- 6.360 The traffic and transport issues associated with the construction of the gas and grid connections will be limited and most likely will be more localised. These will be considered in more detail in the TA and EIA, once further information on the routes is available.
- 6.361 During the operation of the power station, it is expected that there could be up to 50 workers split over two working shifts. Assuming that 90% travel in private cars (as per the current norm for the industrial estate) it could be that there are up to 90 private car vehicle movements a day. The operational power station could also receive around 5 HGV deliveries a week.

⁴⁵ Proposed Industrial Units, Bryn Lane, Wrexham Industrial Estate. Transport Assessment. September 2008. Crowd Dynamics.

- 6.362 The environmental effects associated with traffic during the construction and operation of the WECC will arise from changes to traffic flows, volumes and speeds, as well as the type and size of vehicles. These changes will be the subject of the EIA and as well as having implications for the capacity of the highway network and congestion, can also give rise to issues such as fear and intimidation for vulnerable road users, severance, driver and pedestrian delays, accidents and safety, and the effects of hazardous or abnormal loads.
- 6.363 The traffic effects during decommissioning and demolition are likely to be comparable to those during construction, with the additional traffic generated including HGVs and abnormal loads presenting the potential for changes in traffic flows, volumes and speeds on roads at the WIE as well as the wider area.

Assessment methodology

- 6.364 A Transport Assessment will be carried out in consultation with WCBC, other affected highways authorities and the North and Mid Wales Trunk Road Agency where necessary. The Transport Assessment will be undertaken in accordance with the Guidance on Transport Assessments⁴⁶ issued by the DfT. The Transport Assessment will be a supporting document for the ES.
- 6.365 The EIA for traffic and transport will then be carried out, based on the findings of the Transport Assessment, following guidelines published by IEMA⁴⁷. The methodology focuses on:
- the potential effects on local roads and the users of those roads; and
 - the potential effects on land uses and environmental resources fronting those roads, including the relevant occupiers and users.
- 6.366 The IEMA guidelines specify the following criteria to delimit the scale and extent of the impact assessment:
- highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and
 - any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 6.367 The IEMA guidelines recommend that the environmental effects listed below should be taken into account when considering traffic from an individual development:
- noise;
 - vibration;
 - visual effects;
 - severance;
 - driver delay;
 - pedestrian delay;
 - pedestrian amenity;

⁴⁶ Guidance on Transport Assessment. 2007. Department for Community and Local Government and Department for Transport (DCLG & DfT).

⁴⁷ Guidelines for the Environmental Assessment of Road Traffic. 1993. Institute of Environmental Management & Assessment (IEMA).

- fear and intimidation;
- accidents and safety;
- hazardous loads;
- air pollution;
- dust and dirt;
- ecological effects; and
- heritage and conservation.

6.368 Of these effects, many will be considered in the specific environmental topic chapters of the ES (i.e. air quality, noise, landscape, heritage, ecology). Therefore, the following effects will be considered as part of the traffic and transport impact assessment. All relate to the increase in traffic and HGVs generated by the development:

- potential effects on community associated with severance;
- potential effects on drivers associated with driver delay;
- potential effects on pedestrians associated with delays;
- potential effects on pedestrian amenity;
- potential effects on pedestrians and cyclists associated with fear and intimidation; and
- potential effects on road safety associated with Personal Injury Accidents.

6.369 The impact of construction and operational traffic will be calculated in percentage terms relative to the background traffic during the construction and opening years respectively. A qualitative assessment of the impact of traffic associated with decommissioning and demolition will be included.

Potential mitigation

6.370 The potential mitigation measures are likely to involve the following:

- a Construction Traffic Management Plan covering HGVs and abnormal load management;
- a specified haul route for operational HGV deliveries;
- a Travel Plan for site construction and operational workers; and
- the Construction Traffic Management Plan will limit the impact of construction traffic by requiring contractors to comply with rules on:
 - routing to restrict the impact of construction vehicles to specified routes to be agreed with the highway authority;
 - timing of movements to avoid peak traffic flows (this is expected to be mainly associated with AM and PM peak hour periods and peak holiday traffic);
 - escorts for abnormal loads, together with accommodation / reinstatement works;
 - the covering of loads to minimise pollution; and

wheel washing to minimise mud and debris on the public highway. To this effect, it is recommended that mud and debris on the carriageway in the vicinity of the site access is monitored during the construction period.

- 6.371 The specification of haul routes for operational HGV deliveries will enable the potential effects of HGVs on local roads and road users to be minimised. For construction and operational workers, a Travel Plan will be developed to promote the use of sustainable transport to and from the power station site. The Travel Plan will have the following main objectives:
- to minimise and seek ongoing reduction of car use for accessing the WEC site;
 - to provide a variety of incentives for staff to travel to the site by means other than single occupancy vehicles;
 - to inform staff of the travel options available to them as an alternative to private car use; and
 - to monitor the progress of the travel plan and to implement further measures where necessary in order to meet targets for the reduction of single occupancy vehicles.

Socio-economic effects

Introduction

- 6.372 Where there is the potential for socio-economic effects from a proposal NPS EN-1 requires that an assessment of the potential effects be included in the ES (paragraph 5.12.2).
- 6.373 Paragraph 5.12.3 of EN-1 sets out examples of socio-economic effects which should be considered:
- the creation of jobs and training opportunities;
 - the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities;
 - effects on tourism;
 - the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development; and
 - cumulative effects – if development consent were to be granted to for a number of projects within a region and these were developed in a similar timeframe, there could be some short-term negative effects, for example a potential shortage of construction workers to meet the needs of other industries and major projects within the region.

- 6.374 This section of the scoping report presents a brief overview of the socio-economic conditions in the area of the proposed WECC. It provides a brief outline of potential areas of socio-economic effects (essentially all benefits) along with a methodology for undertaking the full socio-economic assessment.
- 6.375 Equality is concerned with discrimination against different groups of people particularly those who could be disadvantaged or vulnerable. In considering equality, consideration should be given to whether the development proposals could give rise to discrimination on the basis of religious beliefs, political opinion, racial groups, age, marital status, sexual orientation, men and women generally, disability and those with caring responsibilities.
- 6.376 The design of the facility will take account of aspects such as the need for disabled access and the provision of welfare facilities suitable for different gender and racial groups. Such aspects will be defined in the Design and Access Statement that will accompany the application for the DCO. Certain public consultation events and published information on the development proposals will be bilingual in English and Welsh as agreed with WCBC, and set out in the SOCC. In addition to socio-economic effects, the EIA will then also consider certain equality aspects such as the implications of construction traffic for vulnerable road users. Such aspects will be detailed in the ES. On this basis, a separate equality impact assessment is not considered necessary.

Study area

- 6.377 In order to place the project in the wider context, the assessment will consider and compare the socio-economic conditions across a number of geographies (where possible) including the Holt, Marchwiel, Bronington and Ponciau wards in which the scheme is located, Wrexham County Borough and Wales.

Baseline description

- 6.378 The data sources considered for this socio-economic appraisal comprise the 2011 Census, Claimant Count & Annual Population Survey available via NOMIS.

Population and demographics

- 6.379 In the 2001 Census the population of the Holt Ward was 2,828, which accounted for approximately 2.2% of the total population of Wrexham. The population of Wrexham County Borough increased 4.0% over the period 2001 to 2010 to 133,600 people, this compares to a population increase of 3.6% for Wales as a whole. Updated population estimates at ward level for the study area are currently unavailable but this will be investigated further at the next stage.
- 6.380 Figure 8 below shows the economic activity levels in the twelve months up to September 2011.

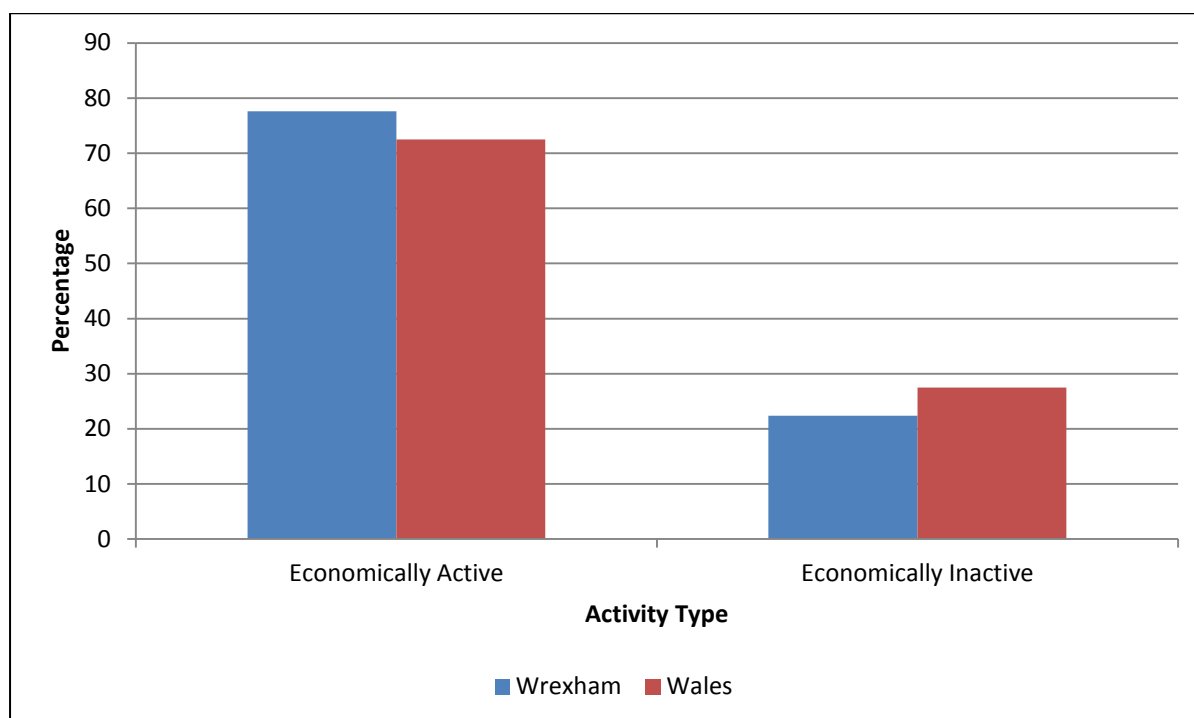


Figure 8: Economic Activity and Inactivity October 2010– September 2011 (as a % of Working Age Persons)

- 6.381 The economic activity rate demonstrates that the overall participation rate in the labour market was relatively high in Wrexham at 77.6%, and above the average rate of economic activity for Wales (72.5%) as a whole.
- 6.382 The latest Claimant Count Data (January 2012) is shown in Figure 9 and highlights that the rate of those claiming unemployment benefits in the Holt ward was 1.7% which is the lowest across the benchmark areas, with rates in Wrexham and Wales being broadly similar (4.2% and 4.4% respectively).
- 6.383 Figure 9 sets out the trend of rising number of people claiming unemployment benefit in all areas between 2008 and 2010, which is in line with the impact of the economic recession. Wrexham and Wales experienced a small dip in benefit claimants in 2011 which was followed by a further increase in 2012. In contrast the Holt Ward experienced a further small decline in the percentage of residents claiming benefit in 2011 and 2012. The claimant count rates in the Holt ward was consistently the lowest across all areas between 2007 and 2012.
- 6.384 Figure 10 shows Wrexham to have an average unemployment rate of 6.5% in 2010-2011, which is below the average for Wales over the same period at 8.7%. There is a clear trend of a rising rate of unemployment from 2005-2006 onwards for both Wrexham County Borough and Wales as a whole. This trend is more pronounced for Wales, with a greater degree of deviation between the unemployment rates of the two areas from 2008-2009 onwards.

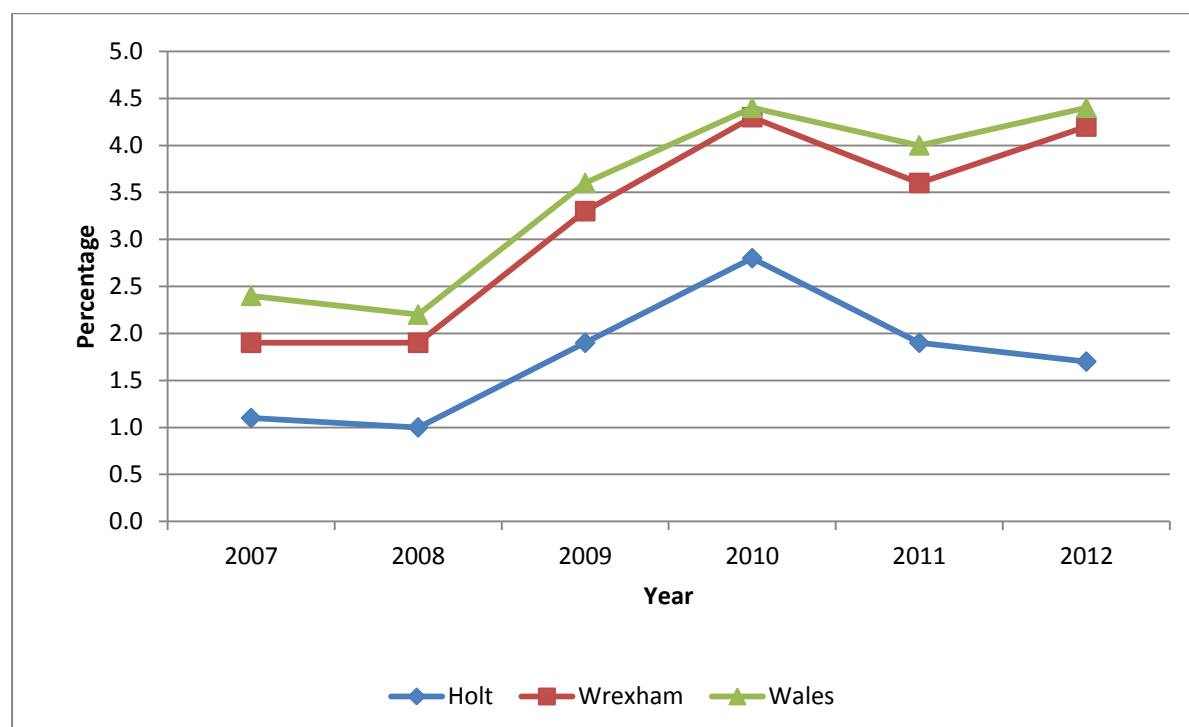


Figure 9: Claimant Count Rate (Annual as of January) 2007- 2012

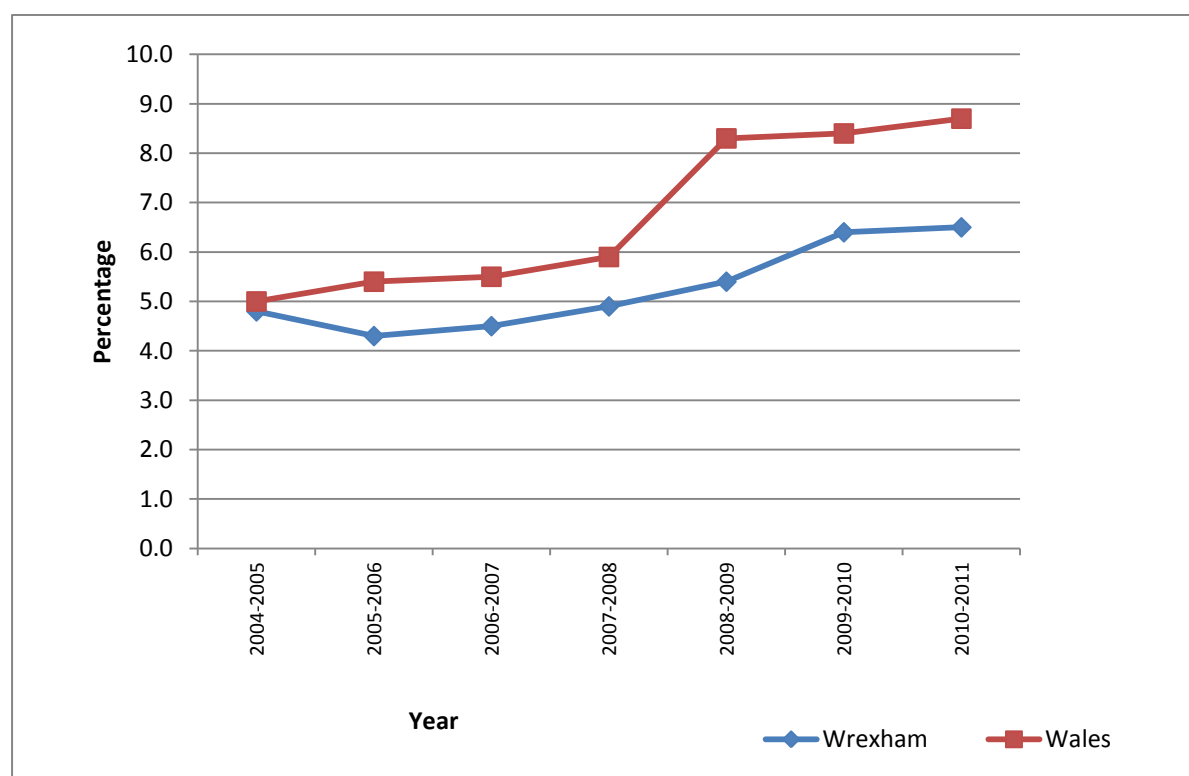


Figure 10: Unemployment Rate (average yearly) of working age population 2004-2011

- 6.385 This initial overview of the area's socio-economic indicators suggests relative economic prosperity in the ward and wider area of Wrexham, especially when compared to the average for Wales. Further analysis is now required at the EIA stage to consider in greater detail and broader coverage the socio-economic conditions in both the study area and benchmark areas.

Potential effects

- 6.386 Given the scale of the project it is possible that there will be direct positive effects in socio-economic terms from the scheme at both the construction and operational stages. For example, power stations of this type can typically create 1,200 construction jobs and 50 permanent jobs. The development also presents opportunities for further socio-economic benefits such as through the provision of heat/power to local businesses and the potential for the project to result in the upgrading the existing electricity supply to the industrial estate.
- 6.387 All the potential socio-economic effects outlined below will be examined and assessed fully in terms of likelihood and significance at the EIA stage. The socio-economic effects of the scheme are likely to include the following:
- Creation of temporary construction jobs;
 - Local training;
 - Temporary disruption to local residents and businesses during construction;
 - Creation of additional direct jobs from operation of the plant;
 - Indirect employment and income in the economy;
 - Changes in property prices in the locality;
 - Contribution to the local area's energy needs through CHP;
 - Security of existing electricity supply to the local industrial estate;
 - Contribution to the national energy needs.

Assessment methodology

- 6.388 The socio-economic impact assessment will examine the baseline conditions and potential effects of the proposed CCGT plan scheme in more detail. The baseline assessment will include qualitative and quantitative information including an in-depth study of the socio-economic conditions in the area, a review of relevant regeneration and economic development documents/ initiatives and consultation with relevant stakeholders.

Socio-economic baseline

- 6.389 At the EIA stage a full and detailed socio-economic baseline will be produced for the ward, a defined Local Impact Area and benchmarking against the County Borough of Wrexham and also Wales. The analysis will follow the indicators below, which are deemed to be the most relevant to this study:
- Working Age Population – current and projected levels of the working age population will be analysed in order to understand the potential availability of labour at present and in the future;

- Economic Activity – levels of economic activity indicate the current size of the available workforce and are an indication of how active the population is within a labour market. The types of economic activity, the impact of the recession and likely trends over time will be examined further;
 - Unemployment – analysis of unemployment data will help identify the current supply of and demand for labour in the ward and defined Local Impact Area and assess the potential for travel to other areas;
 - Employment and Business structure – the number of people employed in the area and the number of business units will be analysed and broken down by sector in order to identify the most dominant industries in the local area. This will help further identify the current demand for employment and match against supply.
 - Travel to work patterns – this will be examined in terms of the types of journeys currently made from the ward/ defined Local Impact Area and provide greater understanding of the spatial movement of labour, by number and mode around the area;
 - Deprivation – levels of overall deprivation in the area will be analysed, alongside education, skills and training, employment, and income deprivation.
 - Housing market – analysis of current stock, prices and any projected growth areas.
 - Employment Land – demand for employment provision will be understood.
- 6.390 This evidence base will inform the assumptions that can be made about the socio-economic effects in the locality.

Consultation and contextual analysis

- 6.391 A brief review will be undertaken of the socio-economic policy context at the local and national level. At the EIA stage we will consult with relevant stakeholders including regeneration and economic development officers at the Council in order to gain a more detailed understanding of the area, the key socio-economic challenges and opportunities it faces and how the proposed scheme may affect the wider area.

Economic impact assessment

- 6.392 The socio-economic baseline, review of relevant policy context and discussion with key stakeholders, as described above, will form the basis for assessing the economic impact of the scheme. The economic impact analysis will set out the contribution of the scheme to the local economy and will consider the following effects, dependent upon the evidence from the earlier analysis:
- Employment Effects. This will include temporary construction jobs and direct employment from the scheme.
 - Income Effects. This will assess the income projections into the local economy, calculated for the construction and operational phases, including potential supply chain and consumption effects where applicable.
 - Wider Economic effects. This will assess any other impact including impact on potential labour market movement, new employment and training opportunities and potential contribution to the area's energy needs.

- Any disruption to local residents and businesses, especially during the construction phase. If any adverse effects are identified then appropriate mitigation measures will be considered.

Cultural heritage

Introduction

- 6.393 National policy guidance relevant to cultural heritage is contained in section five of NPS EN-1. Paragraph 5.8.8 of EN-1 notes that *'the applicant should provide a description of the significance of the heritage assets affected by the proposed development and the contribution of their setting to that significance.'* The paragraph continues to state that *'The level of detail should be proportionate to the importance of the heritage assets and no more than is sufficient to understand the potential impact of the proposal on the significance of the heritage asset.'*
- 6.394 This section presents the proposed approach to the assessment of the potential impact of the scheme on the Historic Environment. The WEC is to be situated at Bryn Lane on the edge of an existing major commercial development and lies partially on previously developed land. The project also includes an overhead line connection to the Legacy substation to the west of Wrexham and a gas pipeline installed below ground to connect to the national gas transmission system to the south. In this context, this section of the scoping report briefly reviews the nature of possible effects that may be associated with these three different elements of the scheme and hence the scope of assessment that may be required.

Study area

- 6.395 For the assessment of the potential effects on buried archaeological remains, the study area needs to consider land what will be directly affected by and in close proximity to areas of ground disturbance that will occur during construction of the power station and its associated infrastructure. For buried archaeology the study area is therefore to be a 1 km radius centred on the proposed power station site and 500 m either side of the gas and electricity grid connection routes.
- 6.396 For the assessment of the effects on built heritage and historic landscape character areas, the study area will be guided by the VE as defined by the landscape and visual impact assessment (LVIA).

Baseline description

- 6.397 The heritage and archaeology baseline has been evaluated for the purposes of this scoping report utilising the following sources of information:
- The CCW and Cadw website accessed on 7th September 2011 for information on sites with a statutory cultural heritage designation.
 - The MAGIC website accessed on 7th September 2011 for information on sites with a statutory designation.
 - The English Heritage website accessed on 7th September 2011 for citation information on sites identified through the MAGIC website.

- 6.398 In terms of archaeological remains, a study area of 1 km radius centred on the proposed power station site and 500 m either side of the gas and electricity grid connection routes was used to gather preliminary data on known archaeological remains.
- 6.399 In order to consider the potential effects on the setting of designated heritage assets, a wider study area has initially been considered of 5 km radius around the proposed power station site and 1 km either side of the power line route. This will be revisited as part of the EIA process through the development of a zone of visual influence established as part of the assessment of landscape and visual effects. The locations of the following assets within these study areas have been identified:
- Listed Buildings
 - Conservation Areas
 - Scheduled Monuments
 - World Heritage Sites and their Buffer Zones
 - Assets on Part I and II Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales
- 6.400 While there are no sites with a statutory designation within the area proposed for the power station, the preliminary identification of recorded heritage assets within 5 km of this development area has identified those listed in Table 16: Heritage Sites within a 5 km Radius of the WEC Site.

Table 16: Heritage Sites within a 5 km Radius of the WEC Site

Designation	Site Name	Distance and Direction From WEC Site
Scheduled Monuments	Churchyard Cross at St Edith Church	3.2 km E
	Shocklash Castle	3.7 km E
Listed Buildings	Crew Hill and Cottage, Grade II	3.8km NE
	Church at St Edith, Grade I	3.2 km E
	Medieval cross at St Edith Church, Grade II	3.2 km E
Conservation Areas	None	
World Heritage Sites	None	
National Trust Properties	None	
Registered Battlefields	None	
Registered Parks & Gardens	None	

- 6.401 Within the study area for the gas and electricity grid connections there are a number of recorded heritage assets. The preliminary identification of these recorded heritage assets within 1 km either side of the connection route corridors are listed in Table 17.

Table 17: Heritage Sites within a 1 km of the Connection Route Corridors

Designation	Site Name
Scheduled Monuments	Erddig Mound and Bailey Castle
	Wat's Dyke
	Offa's Dyke
Listed Buildings	Numerous Grade II and Grade II* Listed Buildings comprising mainly churches and farm buildings
	Erddig Hall Grade 1
National Trust Properties	Erddig House, Walled Garden and Country Park
Registered Parks & Gardens	Erddig Park
Registered Battlefields	None
Conservation Areas	Bangor Is-y-Coed
	Marchwiel
World Heritage Sites	None

Potential effects

- 6.402 Initial analysis of the site for the WEC indicates that a considerable portion of the site was subject to development through the 20th century. In these areas any significant archaeological remains are likely to have been removed. However, some areas of the proposed development site have not previously been subject to development. These areas have the potential to contain archaeological remains which could be adversely affected by the proposed development.
- 6.403 The WEC site contains no designated or undesignated heritage assets. It will not therefore require the demolition or physical alteration of any such assets. However, the proposed development could affect the setting of known designated heritage assets in the landscape around the proposed development site. These assets include listed buildings and scheduled ancient monuments as listed in Table 16 above.
- 6.404 The electricity grid connection will require the installation of pylons with connecting wires. These will be a new addition to the landscape south of Wrexham. As such they have the potential to affect the setting of designated buildings, monuments and landscapes in that area including a number of listed buildings, scheduled monuments and a historic park and garden.
- 6.405 The installation of the pylons is however unlikely to result in significant disturbance to archaeological remains, although there may be localised effects.
- 6.406 Installation of the gas pipeline will require a corridor of ground disturbance which could adversely affect below and above ground archaeological remains. The construction works would also result in short term temporary effects on the setting of designated features due to the presence of construction plant and equipment, and short - medium term effects on the fabric of the wider historic landscape due to the loss of vegetation and the medium term timescales for the establishment of replacement vegetation.

- 6.407 The potential effects during decommissioning and demolition are likely to be similar to those during construction, with potential impacts on buried archaeology in areas of new ground disturbance, short term impacts on the setting of designated heritage assets where plant/equipment is in use, and the medium term impacts associated with vegetation loss on the setting of heritage assets and the historic landscape character.

Assessment methodology

- 6.408 The assessment will address the potential effects described above, namely:
- effects on archaeological remains within the development footprint of the proposed power station site and gas and electricity grid connections; and
 - changes to the setting of designated heritage assets in the landscape around the proposed power station and grid connection routes.
- 6.409 The heritage assessment will take account of relevant guidance including the Institute of Archaeologists' "Standard and Guidance for Archaeological Desk-Based Assessments", Cadw's "Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process" and the Highways Agency's DMRB.
- 6.410 Consultation with Cadw, the local planning authority's archaeological advisor, and, if necessary, conservation officer, will be undertaken.
- 6.411 The assessment will consider impacts during construction, operation and the decommissioning and demolition of the WEC site and connections.

Desk study

- 6.412 In terms of archaeological remains a study area of 1 km radius centred on the proposed power station site and 500 m either side of the gas grid connection route will be established to gather data on known archaeological remains. This will support the assessment of the construction footprint's potential to contain currently unknown archaeological remains. Data will be gathered from the relevant local historic environment record. In addition historic map data and readily available secondary sources will be consulted. From this a standard archaeological desk based assessment will be prepared.
- 6.413 Depending on the final form of the power station and overhead line, effects on the setting of the designated built heritage assets may require a substantial study area. The scope of the study area will be determined by the zone of visual influence (ZVI) established by the LVIA. To support the impact assessment data for the following asset types will be collated for a 5 km radius around the proposed power station site and 1 km either side of the power line route:
- Listed Buildings
 - Conservation Areas
 - Scheduled Monuments
 - World Heritage Sites and their Buffer Zones
 - Assets on Part I and II Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales

- 6.414 Once the ZVI has been established the assets potentially affected by the scheme will be identified from this dataset and their settings described.

Additional field studies

- 6.415 The need, for and scope of, additional field studies will be determined through the EIA process. These field studies may include consideration of buried archaeological remains, built heritage and/or the historic landscape character.
- 6.416 Site visits will be undertaken to confirm the potential for survival of buried archaeological remains within areas that would be subject to disturbance of the ground. The site survey will also seek to locate as-yet unidentified archaeological remains and discover further details of known archaeological assets such as Wat's Dyke and Offa's Dyke. If necessary, and in consultation with the statutory authorities, an archaeological geophysical survey would be undertaken covering a wide enough area to permit informed refinement of the detailed design to minimise effects to archaeological remains.
- 6.417 Circumstances may arise where there is insufficient data to determine conclusively whether the proposed development could cause effects on archaeological remains that cannot be mitigated during the construction phase of development. For example, this may be because the geophysical survey locates data suggesting the presence of important remains, or very large volumes of remains. In such circumstances, consultation with the regulators will be undertaken, following which it may be necessary to undertake limited trial trenching, to investigate specific areas.
- 6.418 Limited trial trenching may also take place if it is considered worthwhile to aid sensitive design, and reduce effects. In all other cases, intrusive survey will be avoided in favour of a combination of physical preservation and mitigation by investigation and recording during the construction phase.
- 6.419 Site visits to assess the setting of historic buildings that may be affected by the proposed development would be undertaken, to identify details of their significance and setting not available through desk-based assessment. The visits would assess the character and significance of buildings of historic value, and the proposed development's impact on their setting.
- 6.420 Assessment of historic landscape character through site survey would be required, to identify the condition of known assets and presence of as-yet unidentified assets that may be impacted by the proposed development.

Impact assessment

- 6.421 The environmental effect of the proposals, in relation to an individual asset, is determined through identifying the asset's value and then assessing the impact that the proposal would have on the significance of that asset (i.e. the attributes that provide it with its value). This well established approach of combining value and impact to determine effect provides clear differentiation between significant and insignificant environmental effects.
- 6.422 Table 18 sets out the criteria for identifying the value of an asset, assessing its impact and how these are combined to determine the effect.

Table 18: Criteria for identifying the value of an asset

Value	Description	Example
High	Nationally or internationally important heritage assets generally recognised through designation as being of exceptional interest and value.	World Heritage Sites, Grade I and II* Listed Buildings, Grade I and II* Registered Landscapes or Outstanding Landscapes on the Register, Scheduled Monuments, Protected Wreck Sites, Registered Historic Battlefields, Conservation Areas with notable concentrations of heritage assets and undesignated assets of national or international importance.
Medium	Heritage assets recognised as being of special interest, generally designated.	Grade II Listed Buildings, Grade II Registered Parks and Gardens or Special Historic Landscapes, Conservation Areas and undesignated assets of regional or national importance.
Low	Assets that are of interest at a local level primarily for the contribution to the local historic environment.	Undesignated heritage assets such as locally listed buildings, undesignated archaeological sites, undesignated historic parks and gardens etc. Can also include degraded designated assets that no longer warrant designation.
Negligible	Elements of the historic environment which are of insufficient significance to merit consideration in planning decisions and hence be classed as heritage assets.	Undesignated features with very limited or no historic interest. Can also include highly degraded designated assets that no longer warrant designation.

6.423 Table 19 sets out the broad criteria for assessing the scale of beneficial and adverse change.

Table 19: Criteria for the scale of beneficial and adverse changes

Scale of Change	Description of nature of change
Large Adverse	Substantial harm to, or loss of, an asset's significance as a result of changes to its physical form or setting. For example, this would include demolition, removal of physical attributes critical to an asset, loss of all archaeological interest or the transformation of an asset's setting in a way that fundamentally compromises its ability to be understood or appreciated. The scale of change would be such that it could result in a designated asset being undesignated or having its level of designation lowered.
Medium Adverse	Less than substantial harm to an asset's significance as a result of changes to its physical form or setting For example, this could include physical alterations that remove or alter some elements of significance but do not substantially alter the overall significance of the asset, notable alterations to the setting of an asset that affect our appreciation of it and its significance, or the unrecorded loss of archaeological interest.

Scale of Change	Description of nature of change
Minor Adverse	Limited harm to an asset's significance as a result of changes to its physical form or setting For example, this could include physical changes that alter some elements of significance but do not noticeably alter the overall significance of the asset and small-scale alterations to the setting of an asset that hardly affect its significance.
Neutral	No appreciable change to an asset's significance
Minor Beneficial	Limited improvement of an asset's significance as a result of changes to its physical form or setting For example, this could include physical changes that reveal or conserve some elements of significance but do not noticeably alter the overall significance of the asset, or small-scale alterations to the setting of an asset that improve our ability to appreciate it.
Medium Beneficial	Notable enhancement of an asset's significance as a result of changes to its physical form or setting For example, this could include physical alterations that conserve or restore elements of significance, notable alterations to the setting of an asset that improve our appreciation of it and its significance, or changes in use that help safeguard an asset.
Large Beneficial	Substantial enhancement of an asset's significance as a result of changes to its physical form or setting For example, this could include major changes that conserve or restore elements of high significance, alterations to the setting of an asset that very substantially improve our appreciation of it and its significance, or changes in use that safeguard an asset e.g. by taking it off the At Risk Register.

6.424 The environmental effect is determined through a combination of the value of the asset and the scale of the change, as depicted in the table below. This table does not provide a formulaic assessment and professional judgement is used at all stages in the process.

Value	High	Neutral	Slight / Moderate	Moderate / Major	Major
	Medium	Neutral	Slight	Moderate	Moderate / Major
	Low	Neutral	Neutral / slight	Slight	Moderate / Slight
	Negligible	Neutral	Neutral	Neutral	Slight
		Neutral	Minor	Medium	Large
		Change (Adverse or Beneficial)			

Potential mitigation

6.425 Wherever practicable, design responses will be developed during the assessment process to reduce or minimise any adverse effects on archaeological remains or the setting of assets. These measures may include re-siting structures, altering the form of structures, altering the colour of structures, changing the route of pipelines and overhead lines etc. This process should reduce the need for mitigation measures.

- 6.426 Where adverse effects cannot be designed out, appropriate mitigation measures and / or archaeological recording programmes will be identified and incorporated into the scheme where possible and appropriate.

Health, safety and security

Introduction

- 6.427 In constructing and operating the WECC, the health and safety of the employees and the public, and the security of the facility and its associated infrastructure, are of paramount importance. Though not strictly identified as matters to be considered under Schedule 4, part 1, paragraph 19 of the EIA Regulations NPS EN-1 provides some guidance regarding health and safety.
- 6.428 Section 4.11 of EN-1 defers safety issues to the Health and Safety Executive (HSE) and recommends that applicants consult with the HSE on this issue.
- 6.429 Potential health effects are considered in section 4.13 of EN-1 with paragraph 4.13.2 stating that 'where the proposed project has an effect on human beings, the ES should assess these effects for each element of the project, identifying any adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate.'
- 6.430 It is therefore considered that reporting on these aspects will be of benefit to the consideration of the potential effects of the development on human beings and population. Whilst these effects could arise from effects of other sections of the ES, such as air quality and noise, the potential specific effects will be consolidated within a specific ES chapter.
- 6.431 The key aspects to be considered in an assessment of health, safety and security are as follows:
- Construction Design and Management – the design of the WECC will take account of the health and safety implications for construction, operation and eventual demolition. This is a legal requirement under the CDM Regulations⁴⁸ and will take account of general construction and operational safety requirements as given in legislation and guidance published by the Health and Safety Executive (HSE). For all aspects of the design, a Design Risk Assessment will be prepared demonstrating how health and safety risks have been eliminated and providing information on any residual risks.
 - Operational Health and Safety – the power station would operate under an Environmental Permit from the EA and will therefore need to demonstrate compliance with the requirements of BAT for addressing emissions to the environment that could affect public health. In addition, the operation of the power station and its maintenance will fall under the general legal requirements of the Health and Safety at Work Act 1974 for the protection of employees and visitors to the premises.
 - Health Impact Assessment – much of the EIA process considers human beings as a receptor, and therefore many aspects of health impact assessment will be

⁴⁸ Construction (Design and Management) Regulations 2007. HSE/

addressed by individual environmental topic areas such as air quality, land contamination, water pollution and the use of chemicals.

- Electromagnetic fields - consideration will be given to the potential health implications associated with the electric and magnetic fields around overhead power lines and underground cables, substations and grid connection yards.

Study area

- 6.432 The study area for consideration of health, safety and security is defined as the WEC site and its immediate surrounds, up to 500 m from the site boundary, and 500 m either side of the electricity and gas routes when finalised.

Baseline information

- 6.433 The WEC site at Bryn Lane does not fall within the zone of influence of a Major Hazard Site as defined by the HSE, or within the zone of influence of an HSE-licensed explosive site and therefore there are no specific considerations for construction and operation of the facility in this respect.
- 6.434 The development will require work in the vicinity of electrical and gas infrastructure, including direct connections to this infrastructure, and consultation will therefore be required on the requirements of National Grid for safeguarding health and safety including explosion risk.
- 6.435 The Planning (Hazardous Substances) Regulations 1992 are concerned with the storage and use of substances which could present a major off-site risk. The regulations cover the storage and use of natural gas. The power station will not be classed under these regulations as an establishment that presents a major off-site risk and natural gas will not be stored on site. Explosion risks will be managed through the appropriate design and operation of the facility, which will comply with all relevant legal requirements and best practice guidance.
- 6.436 There will be a number of non-hazardous and hazardous chemicals used at site. The site will be permitted accordingly and an inventory of these chemicals will be required by the HSE. In general the main chemicals include acid, alkali (Sulphuric Acid and Caustic Soda) as used in the water treatment plant, hydrazine and/or phosphates used as boiler /steam circuit dosing, inhibitors used in closed circuit coolers and chemical cleaning fluids, paints and other maintenance products.
- 6.437 Oils used at site include those needed for the gas turbine, steam turbine and generator, hydraulic fluids used for valve actuation and in mobile equipment and oils used in transformers and switchgear. Transformers are provided with a containment bund of sufficient capacity to contain both the oil contents as well as water used to contain a fire in the event of a major incident followed by fire.
- 6.438 The potential obligation for CCS may mean that a Hazardous Substance Consent from the HSE would be required in the future depending on the nature and volume of substances to be stored on site to enable carbon capture. The anticipated CCS technology which could be used at the site will be set out in a Carbon Capture Readiness (CCR) report submitted with the DCO application which will include details of the likely chemicals to be used.

Assessment methodology

Power station site and its connections

- 6.439 Many of the health and safety aspects of the development will be covered by specific environmental studies, such as implications for public health of changes to local air quality, or the effects of increased traffic for the safety of motorised and non-motorised users. Many of the health and safety aspects will also be covered by other legal requirements such as through compliance with the CDM Regulations and the Health and Safety at Work Act, or the consents and permits required to operate the facility.
- 6.440 A Health Impact Report will therefore be undertaken to draw together the lines of evidence for the potential effects on public health of the construction and operation of the WECC.

Electromagnetic fields

- 6.441 The report will include the potential effects of electromagnetic fields (EMF) associated with electrical substations, below ground cables and overhead electrical lines. The will be based on an assessment that will follow the guidance of the Health Protection Agency (HPA). The HPA report that the evidence to date suggests there are no adverse effects on the health of the population in the UK caused by exposure to EMFs below guideline levels. Guideline levels are published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) on limiting public exposure to EMF and this advice can be found in the NRPB (now the HPA) 2004 document⁴⁹. The ICNIRP 'guideline levels for the public are:
- 100 microteslas for magnetic fields
 - 5000 volts per metre for electric fields
- 6.442 These are the levels above which more investigation is needed if this level of exposure is likely to occur; the permitted levels of exposure are somewhat higher, 360 microteslas and 9000 volts per metre.
- 6.443 The assessment will include an appropriate risk assessment showing consideration has been given to the mitigation of acute risks and will demonstrate compliance with the ICNIRP guidelines, HPA advice and government policy. If compliance with the published guideline levels is not practicable at all locations accessible to the public, the assessment will provide clear justification for this.

Waste

Introduction

- 6.444 Section five of NPS EN-1 sets out the requirements for assessing waste produced as a result of a NSIP development. Paragraph 5.14.6 requires that a Site Waste Management Plan be prepared setting out the arrangements for managing waste produced. The management plan should include: *'information on the proposed waste recovery and disposal system for all waste generated by the development, and an assessment of the impact of the waste arising from development on the*

⁴⁹ Advice on Limiting Exposure to Electromagnetic Fields. 2004. National Radiological Protection Board

capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation.'

- 6.445 Waste will be generated throughout the full asset lifecycle of the power station and its gas/grid infrastructure, i.e. during construction, operation, maintenance, decommissioning and demolition. Waste can be in solid, liquid or gaseous form. The assessment of the environmental effects of waste and the need to sustainably manage waste are considerations of both the EIA process that will inform the application to the PINS for a DCO, and also the Environmental Permit to operate the power station that will be administered by the EA.
- 6.446 Where liquid wastes are managed through on-site treatment and consented discharges to sewer, the environmental effects will be considered under the assessment of the effects on the water environment. Similarly, gaseous wastes and emissions to atmosphere will be considered through the assessment of effects on air quality. The assessment of the environmental effects of waste will therefore focus on solid waste arisings and those liquid wastes requiring disposal off site.

Study area

- 6.447 The study area for the waste assessment will be based on the consideration of the environs local to the power station site (within a 1 km radius) and areas of construction within the route corridors (within 500 m).

Baseline information

- 6.448 In advance of construction of the WEC, there will be a need for ground excavation and preparatory ground engineering works and these may give rise to surplus soil materials that would require management through re-use or off-site disposal. Part of the site has had a former industrial use and there is a potential for ground contamination which could give rise to the need for localised removal of contaminated soils for treatment or disposal. There will be further ground excavation works associated with the installation of below ground infrastructure such as the gas connection and the structural bases that would be constructed to support the pylons for the overhead connections.
- 6.449 During construction, there will be a range of construction wastes such as concrete, inert construction rubble, scrap metals and waste fuels/oils from construction plant and machinery.
- 6.450 Typical solid wastes generated as a result of the operation and maintenance of a CCGT power station include resins from the water treatment process, general scrap metal from ongoing plant maintenance, with small quantities of waste and hydraulic fluids. In addition there will be general office waste.
- 6.451 The final decommissioning and demolition of the power station and its infrastructure will give rise to a number of large volume waste streams including concrete and metals that can be re-used or recycled, and an array of general wastes from office furnishings to water treatment and cleaning chemicals.

Potential effects

- 6.452 Where waste is generated, it will require appropriate handling, storage, treatment, transportation and disposal, in accordance with legal requirements particularly the Waste (England and Wales) Regulations 2001 and the imposed Duty of Care.

These waste activities, if not managed, have the potential to affect those living close to and working on the Project, to give rise to pollution of the environment locally, as well as requiring capacity from the waste management industry whose services in dealing with waste treatment and disposal would be required.

- 6.453 A detailed inventory of the volumes and types of waste from the construction, operation, maintenance and demolition of the power station has not been prepared at this stage.
- 6.454 The construction and final decommissioning of the WECC will be major projects and therefore have the potential to generate large quantities of waste. These wastes will most likely predominantly be inert and non-hazardous waste providing opportunities for reuse and recycling, or otherwise disposal to a local landfill. Small quantities of hazardous wastes such as oils and chemicals will also be generated that can also readily be safely treated and disposed.
- 6.455 The operation and maintenance of the power station and the gas/grid connections generates minimal volumes of waste and again these are likely to be readily treated and disposed within the capacity of local waste management infrastructure.
- 6.456 The application of the waste hierarchy will be the foremost priority, in accordance with the Waste (England and Wales) Regulations 2011, to minimise the generation of waste:
- Prevention: Using less material in design and manufacture. Keeping products for longer; re-use. Using less hazardous materials
 - Preparing for re-use: Checking, cleaning, repairing, refurbishing, whole items or spare parts
 - Recycling: Turning waste into a new substance or product. Includes composting if it meets quality protocols
 - Other recovery: Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling
 - Disposal: Landfill and incineration without energy recovery

Assessment methodology

- 6.457 There are no published methods of assessing the effects of waste management during the development and operation of energy infrastructure. However, consultation would be carried out with the Constructing Excellence in Wales organisation where appropriate to benefit from dedicated local knowledge and experience. The methodology set out below therefore follows the general approach presented in the IEMA Guidelines for EIA⁵⁰ and the Draft Construction and Demolition Sector Plan⁵¹.
- An estimation of the volumes and classification (inert, non-hazardous, hazardous) of the waste streams that will be generated during construction, operation/maintenance and decommissioning/demolition of the WECC. This will

⁵⁰ Institute of Environmental Management and Assessment (IEMA). 2004. Guidelines for Environmental Impact Assessment. Lincoln: IEMA.

⁵¹ Welsh Government Consultation Document - Towards Zero Waste One Wales: One Planet, Draft Construction and Demolition Sector Plan, 8 November 2011

be undertaken through a literature search and consultation with process operators and technology providers.

- Gathering of baseline information on current waste generation within the local area and the capacity of the local waste management infrastructure.
- Consideration within the design of the need to minimise the generation of waste during construction, operation/maintenance and decommissioning/demolition, and consideration of opportunities for the specification of re-use or recycling of materials.
- Preparation of a Site Waste Management Plan for the construction stage and input to a draft Environmental Permit on waste management for the operational stage, taking account of the waste hierarchy.
- An assessment of the potential impact of waste arisings during construction and operation taking account of best practice approaches to handling, storage, treatment, transportation and disposal.
- Where possible, identifying the potential impact of waste arisings during decommissioning and demolition.

6.458 There are no published criteria for determining the significance of the environmental effects of waste associated with the development and operation of industrial infrastructure. Commonly used methods consider amenity and environmental nuisance issues, and also the local or national capacity of waste management infrastructure. The criteria proposed have been developed to emulate the waste hierarchy and are presented in Table 20.

Table 20: Waste management significance assessment criteria

Significance Criteria	Definition
Major adverse effect	Severe or irreversible adverse environmental or human health effects (e.g. pollution of controlled waters and terrestrial habitats, and/or uncontrolled landfill gas emissions), or major detrimental effects to local amenities from dust, litter, odour or pests associated with waste management. Severe permanent reduction in landfill void space capacity on a local and regional scale. Need for large scale waste treatment facilities to protect against adverse environmental effects.
Moderate adverse effect	Long-term minor or short-term moderate adverse environmental or human health effects or moderate adverse effects to local amenities due to waste management. Slight or moderate, local-scale reduction in landfill void space capacity. Need for medium scale waste treatment facilities to protect against adverse environmental effects.
Minor adverse effect	Short-term minor adverse environmental or human health effects or insignificant detrimental effects to local amenities due to waste management. Slight or moderate, local-scale reduction in landfill void space capacity reversible with time. Need for medium scale waste treatment facilities to protect against adverse environmental effects.
Neutral effect	No waste generation, no discernible effects due to waste management.
Minor beneficial effect	Short-term minor improvement in environmental, human health effects or effects to local amenities due to waste management. Minor decrease in waste generation or minor increase in re-use and recycling levels. Slight or moderate, local-scale reduction in use of landfill.

Significance Criteria	Definition
Moderate beneficial effect	Long-term minor or short-term moderate improvement in environmental, human health effects or effects to local amenities due to waste management. Slight or moderate decrease in waste generation or moderate increase in re-use and recycling levels. Slight or moderate reduction in use of landfill.
Major beneficial effect	Significant improvement in environmental or human health effects (e.g. pollution of controlled waters and terrestrial habitats, and/or uncontrolled landfill gas emissions), or major beneficial effects to local amenities from reduction in dust, litter, odour or pests associated with waste management. Significant decrease in waste generation, landfill disposal or major increase in recycling and re-use levels.

Potential mitigation

- 6.459 Mitigation of the environmental effects associated with waste will focus on the application of the waste hierarchy – prevention, re-use, recycle, recovery, and disposal – and will be taken into account within the design of the facility and its operation.
- 6.460 Key to mitigating the environmental effects during construction will be the development and implementation of a Construction Site Waste Management Plan. This will serve as an inventory of waste, demonstrate compliance with legal requirements such as the Definition of Waste and the Waste duty of care, and will provide targets to deliver any commitments to be made in relation to the waste hierarchy.
- 6.461 During operation (including maintenance), waste will be controlled in accordance with legal requirements under the Environmental Permit issued by the EA.
- 6.462 Mitigation of the potential effects during decommissioning and demolition will be addressed, as far as reasonably practicable, within the design of the power station and its infrastructure. Subject to the ongoing development of best practice in waste management in the future and the proven deliverability of the waste hierarchy, the effects during demolition could also be mitigated through a Demolition Site Waste Management Plan.

Agriculture

Introduction

- 6.463 This section of the scoping report considers the effects on farming and agricultural soils of the proposed development of the WEC connecting via overhead lines to the substation at Legacy and via underground pipeline to the nearest gas pipeline at Talwrn.
- 6.464 Paragraph 5.10.5 of NPS EN-1 requires applicants to identify existing and proposed land uses near the project with paragraph 5.10.8 advising that *‘Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification)’*. This paragraph continues to state that *‘Applicants should also identify any effects and*

seek to minimise impacts on soil quality taking into account any mitigation measures proposed.'

- 6.465 The power station itself would be on a partly brownfield site for which planning permission already exists for industrial development. Part of the site is farmland and may be used, particularly during construction.
- 6.466 The scope of the agricultural land use assessment includes:
- effects on agricultural land quality, including soils;
 - effects on individual farm businesses that are present on, or linked to, the construction site and the pipeline and transmission lines.
- 6.467 The scoping report has been informed by published soil and agricultural land classification (ALC) maps and a field by field aerial view of land use obtainable from Google Earth and Microsoft Bing.

Study area

- 6.468 The study area for the agriculture impact assessment will consider the effect of the development on agricultural land quality and its potential loss, and the effects on businesses that are present on or linked with this land. The study area therefore will be the agricultural land directly affected by the development proposals due to temporary or permanent landtake, or indirectly affected such as could occur if there were temporary closures, access restrictions or severance.

Baseline description

Land use

- 6.469 The study area considered as part of this EIA scoping report has been the proposed WEC site at the Wrexham Industrial Estate and the potential route corridors for the gas and electricity grid connections. Agricultural land use within this study area is almost all improved grassland, with a few fields of combinable arable crops and rough grazing.

Agricultural land classification

- 6.470 The 1988 Revision of the ALC system⁵² classifies land into five grades, Grade 3 being additionally subdivided into grades 3a and 3b. The 'best and most versatile' land is defined as Grades 1, 2 and 3a.
- 6.471 The MAFF Provisional ALC map of Wales shows the study area, comprising the CCGT site and its grid connection corridors, as containing land in Grade 3 with a little Grade 2 in the west, but his map does not subdivide Grade 3 into 3a and 3b.

Soils

- 6.472 The most recently published soil map of the district is the 1:250,000 Soil Map of England and Wales (Wales⁵³) and the soils are described in the accompanying

⁵² Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land. MAFF, 1988.

⁵³ Ministry of Agriculture, Fisheries and Food. Agricultural Land Classification. Wales. 1:250,000. 1982.

book, Soils and their Use in Wales (Rudeforth et al 1983⁵⁴ and 1984⁵⁵). This map around Wrexham is based on the earlier 1:25,000 scale Soils of SJ35 (Wrexham North), published by the Soil Survey in 1978 (Lea and Thompson, 1978⁵⁶).

- 6.473 Most of the study area is shown as slowly permeable, seasonally waterlogged heavy clay loam over clay soils (Salop association) developed in glacial till (boulder clay). There are small areas of better drained loamy soils (Wick and Nercwys associations), mainly in the west.
- 6.474 Soils and their Use in Wales, describes the area around Wrexham as having an average of 175 to 200 field capacity days (when the soils are fully charged with water) per year. In this climate, heavy, wet Salop soils cannot be better than Grade 3b, while the better drained Wick and Nercwys soils are in Grades 2 and 3a. Therefore, on the basis of published information, the majority of the study area is unlikely to be the best and most versatile land. It is unlikely that a detailed soil survey would significantly alter this assessment as the Salop association is uniformly heavy land.

Potential effects

- 6.475 The potential issues during construction include:
- Temporary disturbance to the operation of farms during CCGT construction, pipe laying and overhead line installation. This could include severance of fields, crop losses, damage to hedges and fencing, damage to field drains and water supplies, dust and disturbance to livestock;
 - Damage to soil structure by construction vehicles and soil stripping, storage of construction plant and materials, and restoration.
- 6.476 The potential long term effects include the following:
- Changes, if any, to farm and land value through the presence of pipelines, pylons and overhead transmission lines;
 - Changes to cultivation and harvesting arrangements caused by physical presence of pylons and associated land take.

Assessment methodology

- 6.477 The assessment will be applied to both the construction and operation phases of the proposed scheme.
- 6.478 The assessment will be consistent with the principles set out in the National Planning Policy Framework (NPPF) of March 2012 that replaces earlier Planning Policy Statements (PPS) including PPS7 (Sustainable Development in Rural Areas) and guidance within NPS EN-1. NPPF, like PPS7, requires that local planning authorities seek to protect and preserve, where possible, the best and most versatile agricultural land.

⁵⁴ Rudeforth et al (1983). Soils of England and Wales, Scale 1:250,000. Sheet 2, Wales. Soil Survey of England and Wales.

⁵⁵ Rudeforth et al (1984), Soils and their Use in Eastern England. Soil Survey of England and Wales.

⁵⁶ Lea, J.W and Thompson, T.R.E. (1978). Soils in Clwyd 1, Sheet SJ35 (Wrexham North). Soil Survey of England and Wales.

Desk study

- 6.479 The desk study will consider: plans, drawings and proposed mitigation measures; national and local policy guidance; and published soil, climatic and agricultural maps and data.

Field reconnaissance

- 6.480 Landowner liaison will be undertaken to consider the potential effects of the scheme on land use and to identify opportunities for mitigation. Agricultural landowners and tenants that have the potential to be affected by the scheme would be interviewed individually to obtain baseline data about each holding, including; the size and location of the agricultural units, enterprise type and methods of husbandry and management. Information would also be gathered on field access and drainage. Landowners included within the scope include rural businesses, farms and rural land parcels that the scheme may directly impact, plus those whose access arrangements and infrastructure (such as water supply and drainage) may potentially be affected.
- 6.481 As discussed above, a detailed soil survey is not considered necessary for the EIA as the information gained is unlikely to significantly change the assessment of the ALC based on published material.

Assessment of environmental effects

- 6.482 The general methodology for assessment of the significance of land use impact includes consideration of factors such as land take, soils, farming practice, access, broad economic effects, and drainage and water supply.
- 6.483 A nationally recognised set of standard assessment criteria for effects on agricultural land and farm and other businesses does not exist; bespoke criteria will therefore be used for this assessment. Table 21 and Table 22 present such criteria, which will be further tailored to meet the specific needs of this project through the EIA process if required. Agricultural effects are graded on a scale from neutral to major.
- 6.484 The significance criteria relate to two issues: impact on the national resource of agricultural land quality; and impact on local farm businesses, as set out in Table 21 and Table 22 respectively.

Table 21: Significance of effect on agricultural land quality

Effect	Criteria
Major Adverse	Loss of 20 ha or more of the best and most versatile agricultural land – that is, land classified as Grades 1, 2 or 3a under the MAFF ALC system.
Moderate Adverse	Loss of 10 to 19 ha of best and most versatile agricultural land - Grades 1, 2 or 3a - or 50 ha or more of lower quality agricultural land - Grades 3b, 4 and 5 under the MAFF ALC system.
Minor Adverse	Loss of 5 to 9 ha of best and most versatile agricultural land - Grades 1, 2 or 3a - or 10 to 49 ha of lower quality agricultural land - Grades 3b, 4 and 5 under the MAFF ALC system. A threshold of 10 acres (approximately 4 ha) or more follows the approach of paragraph 6 of the Department of the Environment Circular 71/71 „Development of Agricultural Land“

Effect	Criteria
Very Minor Adverse	Loss of less than 4 ha of best and most versatile agricultural land - Grades 1, 2 or 3a – or less than 10 ha of lower quality agricultural land - Grades 3b, 4 and 5 under the MAFF ALC system.
Note: This follows the approach of Annex B15 of PPG7 as amended March 2001, which stipulated that MAFF had a right to be consulted and hence object to Schemes where a significant amount of such land was required for development. This represents a measure of land loss that has been used in planning issues for 20 years or more. The effects relate entirely to loss of agricultural land relative to the national resource and do not reflect any other inherent characteristics, such as scenic or habitat value.	

Table 22: Significance of effect on local agricultural businesses

Effect	Criteria
Major Adverse	Renders a business, unworkable in its current form, such that it could not continue unchanged; the business would have to change the activities undertaken as well as seeking some form of alternative income.
Moderate Adverse	Changes the workability of a full-time business, but without preventing the business continuing largely as before; there would be reductions in income and changes in day-to-day management of the business.
Minor Adverse	Affects the workability of a full-time business, but with little change to the business continuing largely as before; there would be limited change in income and day-to-day management.
Neutral	No direct impact.

Consultation

- 6.485 Consultation with land owners would be undertaken as described above. The findings of the interviews will be used to identify opportunities for mitigation within the scheme design. Liaison with the design teams will be undertaken to enable mitigation to be included where possible and as appropriate.

Potential mitigation

Effects on soils

- 6.486 The EC Thematic Strategy for Soil⁵⁷ and Government policy has moved away from the protection of land towards the sustainable use of soil.
- 6.487 The quality and quantity of soil on site would be maintained by implementing appropriate techniques for stripping, storing and re-use. This approach would be adopted in a Soil Handling and Management Strategy (SHMS), which would in due course form part of the CEMP.
- 6.488 Where possible, loss of agricultural soils would be minimised by careful engineering design, sensitive landscape works and restoration of disturbed land.

⁵⁷ European Commission (EC) 'Thematic Strategy on Soil Protection.' September 2006.
<http://ec.europa.eu/environment/soil/index.htm>

Effects on farm holdings

6.489 Opportunities for mitigation which will be considered include the following:

- Appropriate compensation for disturbance and loss of farm income during construction;
- Long term compensation through wayleave and easement payments;
- Provision of temporary access, water supplies and fencing during construction;
- Restoration of damaged hedges, fences, tracks, field drains and water supplies at the end of construction;
- Undertaking work in accordance with the CEMP to avoid pollution of natural springs, ditches and brooks on the affected farms;
- Liaising with CCW to maintain compliance with agri-environment Schemes;
- Implementing appropriate bio-security advice/actions given by the Defra with regard to vehicles and materials being brought on to the farm holdings

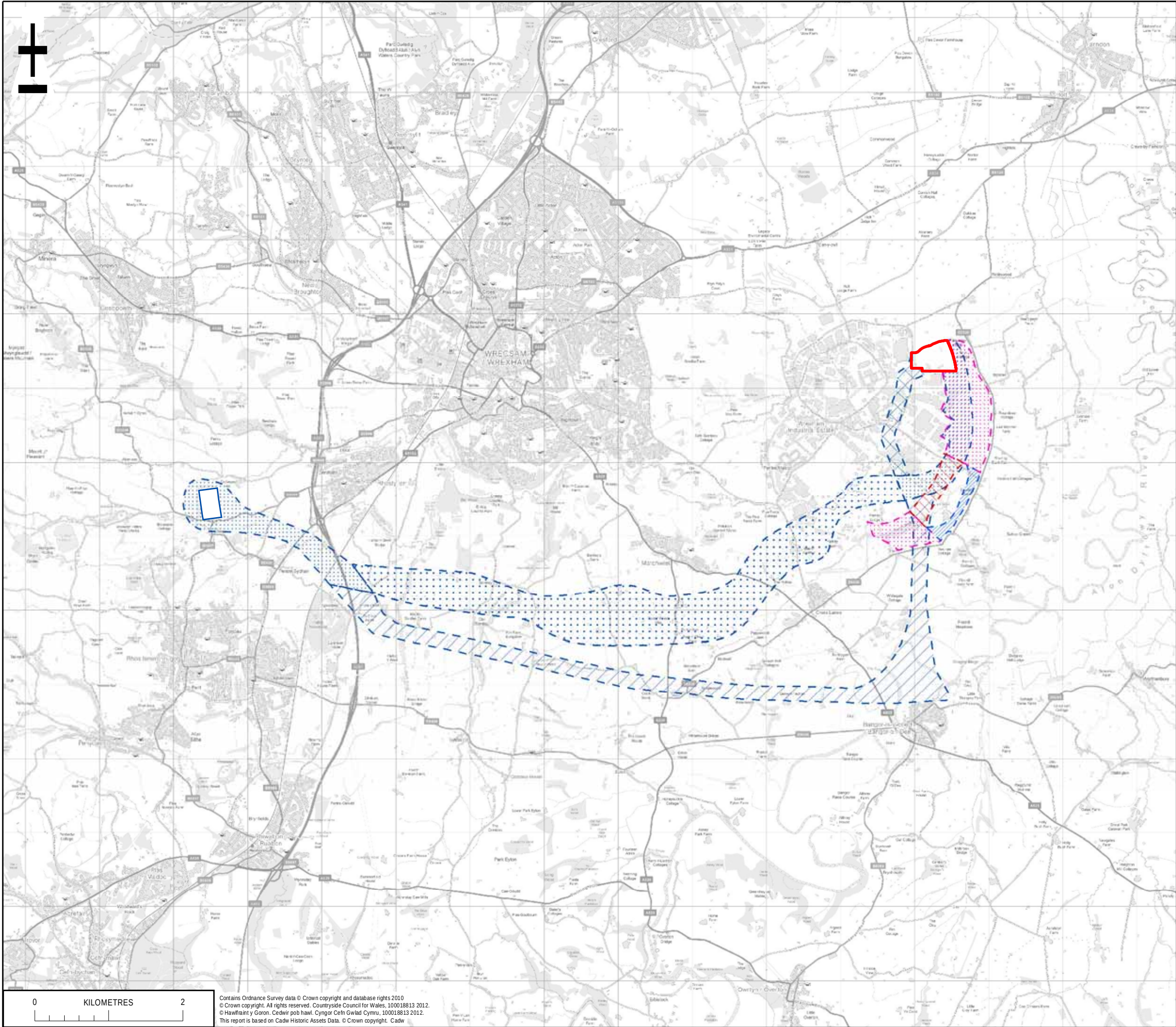
Appendix 1: Table of consultees

Schedule 1 – Table 1 extract

Column 1: Consultee	Column 2: Circumstances when that person must be consulted about a proposed application.	Column 3: Circumstances when that person must be notified about an application.
The Welsh Ministers	All proposed applications likely to affect land in Wales	All applications likely to affect land in Wales
The responsible regional authority	All proposed applications likely to affect land in England and Wales	All applications likely to affect land in England and Wales
The Health and Safety Executive	All cases	All cases
The relevant Strategic Health Authority	All proposed applications likely to affect land in England and Wales	All applications likely to affect land in England
The relevant fire and rescue authority	All cases	All cases
The relevant police authority	All cases	All cases
The relevant parish council, or, where the application relates to land Wales or Scotland the relevant community council	All cases	All cases
The Environment Agency	All proposed applications likely to affect land in England and/or Wales	All applications likely to affect land in England and/or Wales
The Equality and Human Rights Commission	All proposed applications likely to affect land in England and Wales	All applications likely to affect land in England and Wales
The Commission for Sustainable Development	All cases	All cases
Royal Commission on Ancient and Historical Monuments of Wales	All proposed applications likely to affect the historic environment in Wales	All proposed applications likely to affect the historic environment in Wales
The Countryside Council for Wales	All proposed applications likely to affect land in Wales	All applications likely to affect land in Wales
The Commission for Rural Communities	All proposed applications likely to affect rural communities in England	All applications likely to affect rural communities in England

Column 1: Consultee	Column 2: Circumstances when that person must be consulted about a proposed application.	Column 3: Circumstances when that person must be notified about an application.
The Highways Agency	All proposed applications likely to affect road or transport operation and/or planning on roads for which the Secretary of State for Transport is the highway authority.	All applications likely to affect road or transport operation and/or planning on roads for which the Secretary of State for Transport is the highway authority.
Integrated Transport Authorities (ITAs) and Passenger Transport Executives (PTEs)	All proposed applications likely to affect transport within, to or from the relevant integrated transport area of the ITA or PTE	All applications likely to affect transport within, to or from the relevant integrated transport area of the ITA or PTE
The relevant Highways Authority	All proposed applications likely to have an impact on the road network or the volume of traffic in the vicinity of the proposal	All applications likely to have an impact on the road network or the volume of traffic in the vicinity of the proposal
The Coal Authority	All proposed applications that lie within areas of past, present or future coal mining.	All applications that lie within areas of past, present or future coal mining.
The Gas and Electricity Markets Authority	All proposed applications likely to affect gas and electricity markets	All applications likely to affect gas and electricity markets
The Water Services Regulation Authority	All proposed applications likely to affect the water industry in England and Wales	All applications likely to affect the water industry in England and Wales
The British Waterways Board	All proposed applications likely to have an impact on inland waterways or land adjacent to inland waterways	All applications likely to have an impact on inland waterways or land adjacent to inland waterways
The Health Protection Agency	All proposed applications likely to involve chemicals, poisons or radiation which could potentially cause harm to people	All applications likely to involve chemicals, poisons or radiation which could potentially cause harm to people
The relevant local resilience forum	All cases	All cases
Relevant statutory undertakers	All proposed applications likely to affect their functions as statutory undertakers	All applications likely to affect their functions as statutory undertakers

Appendix 2: Site location plan and environmental constraints



ATKINS

- NOTES
1. DO NOT SCALE FROM THIS DRAWING.
- KEY
- Proposed Power Station Site
 - Legacy Substation
 - Electrical Grid Connection - Indicative Route Corridor
 - Route Corridor Alternative Section
 - Route Corridor Common End Sections
 - Route Corridor Option A
 - Route Corridor Option B
 - Natural Gas Connection - Indicative Pipeline Route Corridor
 - Route Corridor Common End Sections
 - Route Corridor Option (East)
 - Route Corridor Option (West)

ATKINS

Atkins Limited
Woodcote Grove
Ashley Road
Epsom, Surrey
KT18 5BW
England

Telephone +44(0)1372 726 140
Fax +44(0)1372 740 055

CLIENT:

WREXHAMPOWERLIMITED

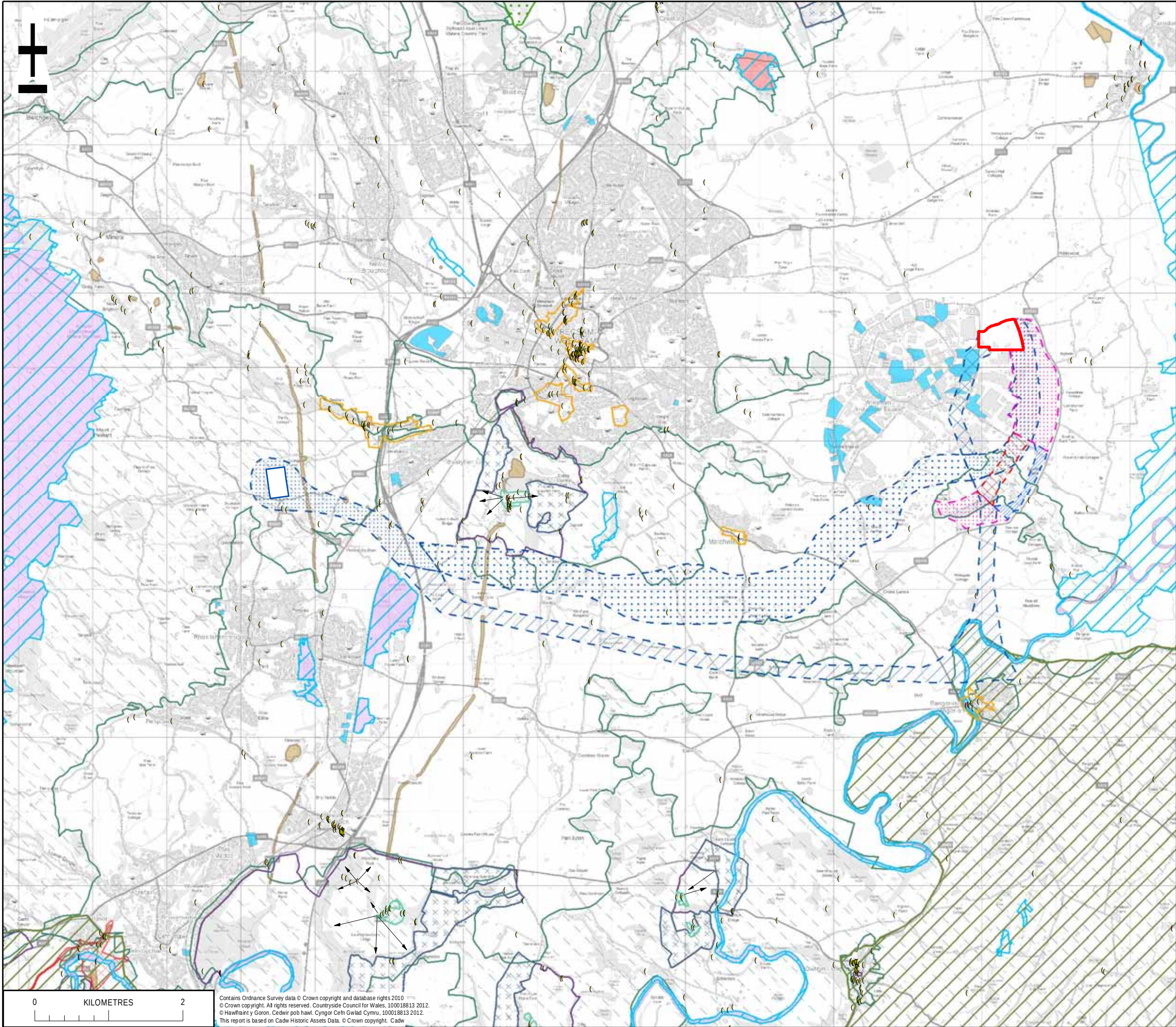
PROJECT:

CCGT POWER STATION AND CONNECTIONS

TITLE:

LOCATION PLAN

SCALE:	ORIGINAL SIZE:	ORIGINATOR:	CHECKED:	REVIEWED:	AUTHORISED:
1:50,000	A3	SJD	IEW	CL	CL
	OFFICE:	DATE:	DATE:	DATE:	DATE:
	GBBMA	08-11-12	08-11-12	- -	- -
Project No:	Discipline:	Type:	Number:	Status/Rev:	
5105324	WRX ENV		001	A	



Contains Ordnance Survey data © Crown copyright and database rights 2010
© Crown copyright. All rights reserved. Countryside Council for Wales, 100018813 2012.
© Hawffraint y Goron. Cedwir pob hawl. Cyngor Cefn Gwlad Cymru, 100018813 2012.
This report is based on Cadw Historic Assets Data. © Crown copyright. Cadw

ATKINS

NOTES

1. DO NOT SCALE FROM THIS DRAWING.

KEY

Proposed Power Station Site

Legacy Substation

Electrical Grid Connection - Indicative Route Corridor

Route Corridor Alternative Section

Route Corridor Common End Sections

Route Corridor Option A

Route Corridor Option B

Natural Gas Connection - Indicative Pipeline Route Corridor

Route Corridor Common End Sections

Route Corridor Option (East)

Route Corridor Option (West)

Constraints

Grade I Listed Building

Grade II* Listed Building

Grade II Listed Building

Conservation Area

Significant View

Local Nature Reserve

SSSI

SAC

RAMSAR

Registered Gardens and Kitchen Gardens

Historic Landscape Area

Essential Setting

Scheduled Ancient Monument

Registered Park Boundary

World Heritage Site

Special Landscape Area - Policy EC5

Employment Allocation

ATKINS

Atkins Limited
Woodcote Grove
Ashley Road
Epsom, Surrey
KT18 5BW
England

Telephone +44(0)1372 726 140
Fax +44(0)1372 740 055

CLIENT:

WREXHAMPOWERLIMITED

PROJECT:

CCGT POWER STATION AND CONNECTIONS

TITLE:

EIA SCOPING
ENVIRONMENTAL CONSTRAINTS
UTILITY CONNECTION CORRIDORS

SCALE:	ORIGINAL SIZE:	ORIGINATOR:	CHECKED:	REVIEWED:	AUTHORISED:
1:50,000	A3	SJD	IEW	CL	CL
	OFFICE:	DATE:	DATE:	DATE:	DATE:
	GBBMA	08-11-12	08-11-12	- -	- -
Project No:	Discipline:	Type:	Number:	Status/Rev:	
5105324	WRX	ENV	002	B	

Appendix 3: WEC: Stage one feedback report

Stage One Feedback Report

wrexham energy centre
and connections

Contents

1. Overview	5
2. Background to the project	8
Introduction	8
The national need for stable and secure power	8
The regional need for stable and secure power	8
The Wrexham Energy Centre (WEC)	8
WEC's electrical connection	9
WEC's gas connection	10
3. Planning the consultation	11
Introduction	11
Producing a Consultation Plan	11
Consulting on Nationally Significant Infrastructure Projects (NSIP)	11
Consulting in stages	13
Proposed consultation over a wide area	13
Proposed engagement with consultees	14
Proposed advertising of the consultation	15
4. Carrying out the consultation	16
Introduction	16
What Wrexham Power Limited (WPL) consulted on	16
Preliminary discussions with Wrexham County Borough Council (CBC)	16
Launching the consultation	17
Presentation to Wrexham County Borough Council	17
Notifying the Planning Inspectorate (PINS)	18
Project documentation	18
Welsh language materials	19
Consulting over a wide area	19
Project website	20
Project leaflet	20
Publicity	21
Public exhibitions	21
Presentations and meetings	23
Inspection copies	24
Hard to reach groups	24
Feedback	24

5.	Summary of Feedback	26
	Introduction	26
	Breakdown of feedback received	26
	Recording and analysing feedback	26
	Main topics of feedback received	27
	Feedback on WPL's preferred site, Kingmoor Park South	29
	Preference of WEC infrastructure orientation at Kingmoor Park South	30
	Preference between the North and South corridors for the electrical connection	31
	Preference between the East and West corridors for the gas connection	32
	The overall project and general feedback	33
	Logged phone calls	33
	Emailed feedback	33
6.	Conclusion	34
7.	Appendices	35
	Appendix 1 – Consultation Plan	36
	Appendix 2 – Map of preferred site, Kingmoor Park South	49
	Appendix 3 – Map of electrical connection corridors	50
	Appendix 4 – Map of gas connection corridors	51
	Appendix 5 – Map of consultation zone	52
	Appendix 6 – Presentation to Wrexham CBC	53
	Appendix 7 – Consultation website	67
	Appendix 8 – Project leaflet	97
	Appendix 9 – Schedule of community consultees written to	107
	Appendix 10 – Example letter to community consultees	116
	Appendix 11 – Bilingual newspaper advert	120
	Appendix 12 – Press release	121
	Appendix 13 – Bilingual poster	124
	Appendix 14 – Reminder press release and clipping	129
	Appendix 15 – Map of exhibition venues	133
	Appendix 16 – Exhibition boards	134
	Appendix 17 – Feedback form (English)	145
	Appendix 18 – Feedback form (Welsh)	149
	Appendix 19 – Indicative site layouts	153
	Appendix 20 – Example signed project information leaflet receipt	155

Feedback and Wrexham Power Limited's response

Appendix 21 – Feedback form: Do you have any comments to make on our preferred site – Kingmoor Park South?	156
Appendix 22 – Feedback form: We also considered two other sites on the Wrexham Industrial Estate for the Wrexham Energy Centre and welcome your comments on these.	159
Appendix 23 – Feedback form: We are presenting three possible layouts for the Wrexham Energy Centre on the Kingmoor Park site. Which option do you prefer?	162
Appendix 24 – Feedback form: The Wrexham Energy Centre requires a connection to the national electricity grid. We have identified two areas in which a connection could be made. Of the two, which option do you think is most suitable?	166
Appendix 25 – Feedback form: Do you have any comments on options for making the electrical connection?	167
Appendix 26 – Feedback form: The Wrexham Energy Centre requires a connection to the national gas transmission network. We have identified an area in which the pipeline could run, including two corridors. Of the two corridors, which option do you think is the most suitable?	170
Appendix 27 – Feedback form: Do you have any comments you would like to make on the gas connection?	171
Appendix 28 – Feedback form: Which of the following proposed new infrastructure are you most interested in?	172
Appendix 29 – Feedback form: Do you have any general comments you would like to make about the proposals?	173
Appendix 30 – Logged phone conversations	209
Appendix 31 – Emailed feedback	211
Appendix 32 – Summary of oral feedback provided at exhibition events	248
Appendix 33 – Completed freepost responses	252
Appendix 34 – Questions from Isycoed Community Council	253

1. Overview

- 1.1 This report describes and summarises the informal (non-statutory) pre-application consultation carried out by Wrexham Power Limited (WPL) in respect of its proposals to develop and operate the Wrexham Energy Centre (WEC), a combined cycle gas turbine (CCGT) power station with a nominal generating capacity of up to 1,200 MWe (megawatts electrical output) on the Wrexham Industrial Estate, and including the WEC's connections to the national electricity and gas transmission systems.
- 1.2 WPL is a joint venture company between St. Modwen, the UK's leading regeneration specialist and Glenfinnan. Both companies have extensive experience in the development and regeneration of sites throughout the country and also have extensive experience in the energy market.
- 1.3 The WEC is designated as a "nationally significant infrastructure project" under the Planning Act 2008, as it has a proposed capacity in excess of 50 MWe. In accordance with the Planning Act 2008, WPL is required to apply for a Development Consent Order (DCO) from the Secretary of State for Energy and Climate Change. The Planning Inspectorate has been given the remit of examining, on behalf of the Secretary of State, applications for nationally significant infrastructure projects. Accordingly, WPL has registered the project and will submit its application for a DCO in respect of the WEC to the Planning Inspectorate, who will examine and consider the application and make a recommendation to the Secretary of State. This process, including the manner in which consultation should be undertaken, is prescribed in the Planning Act 2008.
- 1.4 The consultation described in this report precedes the formal consultation that will be undertaken in accordance with Sections 42, 47 and 48 of the Planning Act 2008. Therefore, this report describes and summarises the non-statutory consultation exercise that WPL carried out, being an informal, introductory stage of consultation. However, WPL will have regard to the feedback supplied and will amend its proposals where appropriate.
- 1.5 The informal, non-statutory stage of consultation took place over eight weeks, commencing on Monday 11 June 2012 and closing on Sunday 5 August 2012. However, all of the feedback received up to the publication of this report is summarised within this report. This feedback is being considered by WPL and its initial responses are summarised in this report. The influence on the project of the feedback received will be explained at the next stage of consultation.

- 1.6 This informal, non-statutory consultation has been undertaken in line with a published Consultation Plan (Appendix 1), agreed with Wrexham County Borough Council. In accordance with this plan, feedback at the informal stage of consultation was requested on:
- the location for the WEC;
 - two further sites considered by WPL;
 - two corridors, through which an electrical connection could be made to National Grid's Legacy Substation; located 1.3km west of Rhostyllen;
 - two corridors in which a connection could be made from the national gas network, providing the fuel for the WEC; and
 - the overall project.
- 1.7 Over the course of consultation, 134 individuals visited exhibition events, 1,467 visits were made to the project website, 60 feedback forms were returned to the WPL team, 42 emails were received, 19 consultation phone calls were logged and meetings were held with key individuals, community councils and organisations.
- 1.8 Through this consultation activity, it has been established at this early stage that:
- the visual and environmental effects of the WEC need to be considered carefully in the design and environmental assessment of the project;
 - some consultees prefer other potential sites for the WEC, predominantly the former Firestone Factory site. This preference comes particularly from the villages of Isycoed and Holt and the area around them;
 - from those expressing a preference, there is a clear preference for an electrical connection to be made within the South Corridor (one of two options proposed)
 - the visual and environmental effect of the proposed electrical connection need to be considered carefully in the design and environmental assessment of the project;
 - there is a slight preference for a gas connection to be made within the East Corridor (one of two options proposed);
 - there appears to be less interest in the gas connection element of the proposals than the WEC itself and its electrical connection; and,
 - the potential commercial and energy supply benefits of the WEC are acknowledged by businesses on the Wrexham Industrial Estate and more widely.
- 1.9 In summary, it was found that there is broad support for the WEC particularly from businesses on the Wrexham Industrial Estate, but also more widely. There are concerns around the visual and environmental effects of the WEC from residents of Isycoed/Bowling Bank and Holt as well as along the electrical connection route corridors. Amongst the wider community there is a clear preference for routeing the electrical connection through the South Corridor.

- 1.10 Full details of the consultation undertaken, the feedback received and WPL's initial response are provided in the body of this report.

2. Background to the project

Introduction

- 2.1 This section summarises the background to the Wrexham Energy Centre project.

The national need for stable and secure power

- 2.2 The UK faces a significant challenge in meeting growing demand for power across the UK. At the same time it has to replace ageing nuclear power stations as well as coal and oil-fired power stations that do not comply with EU emissions directive, the Large Combustion Plant Directive. This states that all non-compliant plants will have to close after either 20,000 hours of generation after 1 January 2008 or, at the latest, 31 December 2015. The first plants to close under these rules will cease generation in spring 2013 at which point they will have reached their maximum hours. This demonstrates that the generation is required, as the plants will have reached their maximum hours nearly three years early.
- 2.3 At present it is anticipated that, if new power generation is not built, the UK will experience shortfalls in supply from winter 2014 onwards. The growing reliance on wind power also leaves the national supply of electricity vulnerable to the UK's variable climate.

The regional need for stable and secure power

- 2.4 The Wrexham area is a net importer of power, meaning that it consumes more power than it produces. Providing a power station on the Wrexham Industrial Estate would help to address this imbalance and improve the security of supply in the county borough area, including the Wrexham Industrial Estate, one of Europe's largest industrial estates.

The Wrexham Energy Centre

- 2.5 WPL proposes to apply for a DCO to build and operate the WEC, a CCGT power station with a nominal generating capacity of up to 1,200 MWe (megawatt electrical) on the Wrexham Industrial Estate in North Wales. It is proposed that the application would also include the WEC's connections to the national electricity and gas transmission systems.
- 2.6 CCGT power stations use gas and steam to generate power. Gas and compressed air are combusted and fed into a turbine, which drives a generator to create electricity. The heat generated by this process is captured to generate steam. This steam is fed, under pressure, into a steam turbine that generates additional electricity. This allows a CCGT power station to be extremely efficient when compared to a traditional gas, coal or oil-fired power station.

2.7 Furthermore the WEC will:

- contribute to replacing 22GW of lost generation nationally;
- provide a reliable and flexible source of power that can be brought on and offline as and when required which will support renewables;
- create up to 50 direct, permanent jobs, and support further jobs indirectly through ongoing maintenance and supply contracts;
- create up to 1,200 temporary construction jobs;
- increase the security of electrical supply to the Wrexham Industrial Estate and its existing 300+ businesses, who between them employ over 7,000 people;
- seek to increase the competitiveness of the Wrexham Industrial Estate through measures such as a district heating system.

2.8 As the WEC's generating capacity will be in excess of 50 MWe, it is classed as a "nationally significant infrastructure project" (NSIP) under the Planning Act 2008 and as such, a DCO from the Secretary of State for Energy and Climate Change is required.

2.9 After extensive due diligence and site search, WPL identified Kingmoor Park South, situated on the Wrexham Industrial Estate, as its preferred site for the WEC (this site is referred to as the "preferred Kingmoor Park South site" in this report). This brownfield site was formerly occupied by a fibreglass factory that was demolished in 2005. In addition, planning permission for a 500,000 sq ft high bay industrial and warehouse building on the site was granted in 2010. A plan of the preferred site is provided in Appendix 2. Before WPL makes a final decision on the site for the WEC, WPL requested feedback during the informal, non-statutory consultation described in this report on the preferred WEC site as well as two alternative sites identified by WPL. WPL is now considering all the feedback received on the sites before it makes its final site choice.

WEC's electrical connection

2.10 Following initial discussions with the National Grid, National Grid's Legacy Substation, 1.3km west of Rhostyllen, has been identified as the electrical connection point for the WEC. This substation has the capacity to take power from the WEC.

2.11 National Grid's Legacy Substation is located 10km west of the preferred WEC site, Kingmoor Park South. The connection is likely to take the form of a high voltage overhead power line, with its exact route to be determined through consultation and environmental field survey work. A map of the potential corridors through which this connection could be made is provided in Appendix 3.

WEC's gas connection

- 2.12 The WEC requires a connection from the national gas transmission network. A spur of this network terminates at the former Maelor Gas Works site (c. 3km south of the preferred WEC site at Kingmoor Park South). As with the electrical connection, the exact route of this connection will be determined through consultation and environmental field survey work. A map of the areas through which this connection could be made is provided in Appendix 4.

3. Planning the consultation

Introduction

- 3.1 This section explains how the approach to the informal, non-statutory consultation was developed to ensure the consultees were introduced to the proposals at the informal stage of consultation.

Producing a Consultation Plan

- 3.2 Prior to consultation commencing, a Consultation Plan (Appendix 1) was drafted and agreed with Wrexham County Borough Council (Wrexham CBC). This plan set out how WPL would introduce the project to consultees and seek feedback on the proposals that would aid the siting and design of the WEC and its associated connections to the national electricity and gas transmission networks.
- 3.3 The Consultation Plan will influence the form and content of a formal Statement of Community Consultation (SOCC), which is required under the Planning Act 2008, before commencement of the formal, statutory stage of consultation. The SOCC will be drafted by WPL and issued to Wrexham CBC for consultation before being finalised and published. The SOCC will set out how WPL will consult the local community in accordance with Section 47 of the Planning Act 2008.

Consulting on Nationally Significant Infrastructure Projects (NSIP)

- 3.4 The proposed WEC is designated as a “Nationally Significant Infrastructure Project” under Section 15(2) of the Planning Act 2008, as its generating capacity is greater than 50 MWe. WPL is therefore required to apply for a Development Consent Order (DCO) from the Secretary of State for Energy and Climate Change. The application will be submitted to the Planning Inspectorate, which will examine and consider the application and make a recommendation to the Secretary of State for Energy and Climate Change. This process, including the manner in which consultation should be undertaken, is prescribed in the Planning Act 2008.
- 3.5 The primary policy basis for decisions made by the Secretary of State is National Policy Statement EN1, which sets out the broad approach to meeting the UK’s energy requirements and sets out the UK government’s policy around fossil fuel electricity generating infrastructure.

- 3.6 The DCO application process is set out in the Planning Act 2008, which also details the manner in which consultation should be undertaken, with which parties, and how it should be publicised. Before commencement of the formal consultation process, WPL will identify all of the consultees necessary to comply with Section 42 of the Planning Act 2008.
- 3.7 WPL has carried out informal, non-statutory consultation in advance of the prescribed process. Accordingly, the consultation recorded in this report is informal, non-statutory consultation that has been undertaken in the spirit of the process set out in the Planning Act 2008. By consulting informally, feedback can be gathered at an earlier stage in the project's design cycle.
- 3.8 Additionally, this preliminary round of the informal, non-statutory consultation has allowed WPL to consider the approach taken to consulting the community, identifying which methods have proved effective and those that could be altered and/or improved ahead of producing the SOCC.
- 3.9 Consultation has been undertaken with the local community informally but will be undertaken formally, as required by Section 47 of the Planning Act 2008, at the next stage of consultation. This includes the production of a SOCC, setting out what will be consulted on and how the consultation will be undertaken.
- 3.10 In this instance the local community is defined as the community living within the core consultation zone and outer consultation zone (shown in Appendix 5).
- 3.11 Section 43 of the Planning Act 2008 sets out which local authorities should be consulted with in order to satisfy the duty to consult set out in Section 42 at the formal stage of consultation. At this informal stage of consultation, WPL fully briefed Wrexham County Borough Council (Wrexham CBC) on the proposals as well as agreeing the Consultation Plan with it. Consultation will be undertaken with the following additional local authorities at the formal stage of consultation:
- Chester
 - Flintshire
 - Denbighshire
 - Powys
 - Shropshire.
- 3.12 Section 44 of the Planning Act 2008 identifies three categories of consultee. 'Category 1' consultees are those persons who are a tenant or owner of land directly affected by NSIP proposals. 'Category 2' consultees are those persons who are interested in this land or have the power to sell, convey or release the land affected by the NSIP proposal. 'Category 3' consultees are those persons that could be entitled to claim under Compulsory Purchase Legislation or the Land Compensation Act. Through informal

consultation with the local community, a number of possible Section 44 consultees have already been engaged with ahead of formal consultation. At the formal stage of consultation, all these consultees will be identified and notified in the prescribed manner.

Consulting in stages

3.13 Consultation on the WEC has been devised to take place over two stages:

1. **Stage one** – informal, non-statutory consultation (and the subject of this report). This stage allows for the proposals to be introduced to the consultees at an early point, allowing feedback to be gathered on key elements of the proposal and to help inform the proposals going forward;
2. **Stage two** – formal, statutory consultation pursuant to Sections 42, 47 and 48 of the Planning Act 2008, as well as the published SOCC (this is expected to take place in the first half of 2013). Detailed proposals including, but not limited to, landscape and visual impact assessment, choice of site, the route corridors for the gas and electrical connections and environmental information will be available at this stage.

3.14 If necessary, depending on the feedback received from the second stage, a third stage of consultation may be held before WPL submits its application for a DCO to the Planning Inspectorate.

Proposed consultation over a wide area

3.15 The proposals for the WEC and its connections to the national electricity and gas networks span a broad geographical area. The Consultation Plan was drafted to account for this and proposed a number of communication methods to promote engagement with a dispersed community spread over a wide area.

3.16 The first step was to identify the area in which consultation would take place. For this purpose two zones were identified, comprising a core consultation zone and an outer consultation zone (Appendix 5).

3.17 The core consultation zone was drawn up around the location of the preferred WEC site and the proposed route corridors for the electricity and gas connection routes.

3.18 The core consultation zone captured those consultees who might consider that they would be directly affected by the project through their proximity to proposed elements of the WEC and/or its connections. This zone included villages such as Isycoed and Marchwiell, businesses and their employees on the Wrexham Industrial Estate and residents living in

the vicinity of National Grid's Legacy Substation, 1.3km west of Rhostyllen, into which the WEC's connection to the national electricity transmission network will be facilitated.

- 3.19 The outer consultation zone was defined as containing those stakeholders who might not be affected by the project, given their distance from the proposed WEC and route corridors, but who might still have an interest in the proposals.
- 3.20 The outer consultation zone extended to cover the town of Wrexham and villages located outside of the core consultation zone.

Proposed engagement with consultees

- 3.21 It was proposed that the most up-to-date information would be provided on a dedicated project website with an associated email address, from which project documentation could be downloaded. Consultees would also be able to call the project team using a Freephone number or write to the team using a Freepost address.
- 3.22 Direct communications materials are an effective way of notifying the community. For this reason, it was proposed that a project leaflet introducing the proposals and guiding recipients to further sources of information be produced and circulated to the core consultation zone.
- 3.23 It was also important to provide consultees with an opportunity to meet the project team in person. For this reason a series of public exhibition events were proposed at accessible and well known venues spread along the route of the proposals.
- 3.24 Using existing channels of communication with the community would allow the project team to further disseminate information. For this reason, presentations to community councils were offered. If requested, presentations would also be offered to civic or amenity groups. Alongside this, meetings with political representatives would be held, informing them of what was proposed in their respective wards and constituencies.
- 3.25 Inspection copies of project documentation such as technical notes would be produced and made available online, at exhibition events and on request.
- 3.26 Hard-to-reach groups are generally defined as being those individuals or groups who are marginalised, disadvantaged or socially excluded. WPL acknowledged that 'hard-to-reach' groups might require information in alternative formats. To accommodate this, WPL committed to making information available in alternative formats, if requested, in the Consultation Plan. No such requests were received.

- 3.27 Welsh language translations of the core consultation materials would also be made available and publicised, including, but not limited to, the project leaflet, the project website and the display boards used during the public exhibitions.

Proposed advertising of the consultation

- 3.28 Widely placed advertising of the consultation would ensure that stakeholders should be aware of the proposals and could therefore participate in the consultation process.
- 3.29 No one consultation tool or method guarantees that all stakeholders will be reached. The Consultation Plan thus provided that the consultation would be promoted through a range of other media channels. These included advertising in a locally circulated newspaper, press releases to other media, posters on community hall notice boards, direct mailshots, radio interviews, press briefings as well as a launch presentation to the members of the Wrexham CBC, who in turn could inform residents of their respective wards.

4. Carrying out the consultation

Introduction

- 4.1 This section details the approach taken to consulting stakeholders, how the informal, non-statutory consultation was undertaken and the channels provided to consultees to submit feedback.

What WPL consulted on

- 4.2 At this stage, the project proposals were only at a formative stage and therefore WPL's broad considerations around siting and design options were presented. Consultees were asked to provide feedback on:
- the general location of the WEC, including WPL's preferred site at Kingmoor Park South and alternatives at Kingmoor Park North and the former Firestone Factory site;
 - three indicative layouts for the WEC on the preferred Kingmoor Park South site;
 - two corridors (North and South) through which the electrical connection to National Grid's Legacy Substation could be made;
 - two corridors (East and West) through which the gas connection could be made to the national transmission system.
- 4.3 The project team will consider the feedback supplied by consultees and assess these representations while developing the detailed design. This design will be shown at the next stage of consultation.

Preliminary discussions with Wrexham County Borough Council

- 4.4 Prior to commencing the consultation process, WPL had carried out detailed analysis of the energy provision in the UK to identify locations for the construction of gas-fired power stations. Wrexham was identified as a location and Wrexham Industrial Estate as a suitable area due to its proximity to both electrical and gas connection points as well as being a large and important employment zone for the area.
- 4.5 Since late 2009, WPL has engaged with officers and members of Wrexham CBC to explain and outline the proposals and discuss the potential of developing a gas-fired power station on the Wrexham Industrial Estate. Summaries of those meetings are outlined below.

- 4.6 26 November 2009 – representatives of WPL met with Wrexham CBC officers. At that meeting the power station concept and the associated electrical and gas connections, the potential requirement for a carbon dioxide pipeline as well as the potential for a heat network for adjoining occupiers were outlined. There was a discussion on potential sites that were large enough to accommodate such a development. A council planning officer confirmed that in principle the proposal would be acceptable to the Local Planning Authority but on the basis of a single user only for the whole site, and not a dual user, so as to comply with Policy E3 of the UDP.
- 4.7 11 June 2010 – representatives of WPL took three officers from Wrexham County Borough Council on a tour of Corby Power Station in Northamptonshire so that they could inspect a similar plant to that which is being proposed at Wrexham Industrial Estate.
- 4.8 9 September 2010 – WPL met Wrexham CBC officers together with the Leader of the Council and the Economic Development portfolio holder. In order to provide an understanding of the WEC concept, WPL presented using the Kingmoor Park North site, as it was the only available site large enough to accommodate the WEC proposal at the time. It was agreed that a presentation to a Council Member Workshop should be arranged to inform members of the proposals and to answer questions.
- 4.9 17 November 2010 – WPL presented the proposals to a Council Member Workshop. A copy of the presentation that was given is provided in Appendix 6. After the presentation was given questions were asked covering site selection, overhead power lines, carbon transport and visible smoke and vapour plumes.
- 4.10 Since November 2010 – further extensive due diligence has been carried out by WPL on the proposals. On the 3 February 2012 representatives of WPL took three officers from Wrexham County Borough Council on a tour of Severn Power Station in Newport, South Wales, so that they could inspect a recently completed plant, similar to that which is being proposed at Wrexham Industrial Estate. WPL worked with Wrexham CBC to develop and agree a Consultation Plan in order to launch the project. The Consultation Plan was agreed on 18 April 2012.

Launching the consultation

- 4.11 The informal stage of consultation was launched on Monday 11 June and closed on Sunday 5 August, a period of eight weeks.

Presentation to Wrexham County Borough Council

- 4.12 The informal, non-statutory consultation was launched at a presentation to members and officers of Wrexham CBC on Monday 11 June 2012. At this presentation, WPL introduced the proposals and provided details on how the consultation would be carried out. A letter

and project leaflet were sent to all councillors ahead of this presentation to give them background information regarding WPL's proposal and the content of the presentation.

4.13 Following the launch, local councillors were directly contacted for a telephone briefing on the proposals so any initial questions or clarification on the process could be answered. The following councillors spoke to a member of WPL:

- Cllr Mark Pritchard – Esclusham ward – 20 June 2012
- Cllr John Pritchard – Marchwiel ward – 20 June 2012
- Cllr Michael Morris – Holt ward – 26 June 2012

These councillors represented some of those wards closest to WPL's preferred Kingmoor Park South site and the proposed corridors through which a connection to the national electricity and gas transmission networks could be made.

Notifying the Planning Inspectorate (PINS)

4.14 WPL notified the Planning Inspectorate of its intention to consult on its proposals on 15 June 2012.

Project documentation

4.15 To support the consultation and provide consultees with the information they required to make informed decisions, the following documents were made available at the public consultation events. In addition, all consultation documentation was uploaded and available on the project website – www.Wrexham-Power.com as well as at exhibition events:

- Consultation Plan, which set out the approach to consulting the community;
- Project Summary, a summary of the proposals;
- Site plans, showing the preferred WEC site at Kingmoor Park South and the two alternative site options on the Wrexham Industrial Estate;
- Project Needs Case, an explanation of why the WEC is required;
- Strategic Options Report, a report on the options considered for the site of the proposals;
- Sustainability Technote, an explanation of how the project would respond to sustainable development policy;
- Ecology Technote, an explanation of the environmental policy and physical constraints considered in siting the WEC;
- Landscape Technote, a report setting out the landscape and visual considerations to be taken in siting the WEC and its connections;
- Historical Technote, an explanation of how the historical and archaeological character of the area is to be taken into account in the siting of the WEC and its connections;

- Planning Technote, a report summarising relevant national and local planning policies that are being considered in bringing the proposed WEC forward;
- Constraints Map, a map of environmental constraints such as flood plains, protected conservation sites that have been considered in selecting the preferred WEC site and route corridors for the electrical and gas connections;
- Plans of three indicative power station layouts, which demonstrated how the WEC's main buildings and plant could be orientated on the preferred site;
- Electrical Connection Corridor Plan, a plan showing the two corridors in which an electrical connection to National Grid's Legacy Substation, 1.3km west of Rhostyllen, could be made;
- Gas Connection Corridor Plan for the two corridors in which a gas connection to a spur of the national transmission network could be made, close to the former Maelor Gas Works;
- The Holford Rules, a guidance document on siting and design of overhead lines devised by Lord Holford and reviewed by National Grid;
- Electromagnetic Fields Booklet, a booklet produced by the Energy Networks Association, providing facts and information on electromagnetic fields; and,
- EU Large Combustion Plant Directive, the European Union Directive which seeks to reduce sulphur dioxide and nitrogen oxides and is predominantly responsible for the closure of a number of non-compliant coal-fired and oil-fired power stations.

Welsh language materials

4.16 In summary, the Consultation Plan states that:

- summaries of the Statement of Community Consultation, each feedback report, the final consultation report, the project website, the project leaflet, exhibition boards and other consultation materials would be provided in Welsh; and,
- bilingual staff would be available at consultation events.

4.17 This commitment to providing key materials in Welsh was fulfilled during the informal consultation stage. Exhibition boards, the project leaflet, the project website, sign-in sheets, adverts and posters were provided in Welsh and English and a Welsh-speaking member of the team was present at each consultation event. A summary of this feedback report is also available in Welsh.

Consulting over a wide area

4.18 It is one of WPL's core objectives to ensure that the local community is provided with an opportunity to participate in each stage of consultation. No single communication method will reach everyone, so the Consultation Plan proposed a number of methods for reaching stakeholders and the local community living in and around Wrexham Industrial Estate and

the electricity and gas corridors, including the surrounding villages and isolated hamlets. These comprised:

- a project website
- a project leaflet
- media coverage
- a touring public exhibition
- presentations and meetings
- inspection copies
- approaches for hard to reach groups.

4.19 These methods are considered in turn below.

Project website

4.20 A bilingual project website (www.Wrexham-Power.com) was created. The website provides a summary of the project and how visitors could participate in the consultation. The website also includes a library from which copies of supporting project documents, plans and maps could be downloaded. In total, this website attracted 1,467 visitors between 11 June 2012 and 5 August 2012. Screenshots of the website are included in Appendix 7.

Project leaflet

4.21 A bilingual project leaflet was produced and hand-delivered to properties within the core consultation zone. A copy of this leaflet is provided in Appendix 8. In total, 6,000 were hand-delivered to addresses in the core consultation zone.

4.22 The leaflet introduced the project and pointed recipients to where they could find further information, how they could contact the team, the dates for the exhibition events and a Freepost response form that could be used to provide initial feedback. Four completed Freepost response forms were returned. The points they raised and WPL's initial responses are included in Appendix 33.

4.23 The project leaflet was hand-delivered by a distribution company to the core consultation zone. The distribution company undertook checks into its delivery, including asking some recipients to confirm they had received materials by signing a receipt. An example of this receipt is included in Appendix 20. While the majority of residents received the leaflet, some told WPL that they had not. However, the project leaflet was one of many methods of promoting the consultation, none of which functioned in isolation. On 12 and 13 June 2012, a member of the WPL project team also called, door to door, on those residents living in the immediate vicinity of the preferred WEC site, Kingmoor Park South, on Bryn Lane and along the B5130 in Isycoed, to reinforce local awareness of the consultation and ensure a copy of the project leaflet had been delivered. If a resident was not at home, a project leaflet was left

at the address. Project leaflets were also sent to all businesses on the Wrexham Industrial Estate.

- 4.24 The public consultation event publicity was also provided to the editor of the Isycoed Newsletter, a voluntarily-produced community publication. The Isycoed newsletter carried these details, and was hand-delivered around the village of Isycoed in the week commencing 25 June 2012.

Publicity

- 4.25 The consultation was publicised through a range of media channels, including:

- Letters were sent on 8 June 2012, to arrive on 11 June 2012, to key community groups, businesses, councillors and organisations notifying them of the consultation launch and public events (a schedule of those written to is included in Appendix 9 and a copy of the letter is provided in Appendix 10);
- A bilingual advertisement was placed in the locally-circulated Wrexham Leader on Thursday 14 June 2012 (provided in Appendix 11);
- A press release promoting the start of the consultation period (provided in Appendix 12) was issued to local media and led to articles in the local press, radio, BBC North Wales website, amongst others. WPL was contacted directly by journalists for comment and journalists also attended the consultation events;
- A press briefing was given to the Wrexham Leader on 15 June 2012, resulting in articles on its website. A radio interview was given to Heart FM, a popular local radio station on 2 July 2012. Details of the project and consultation were provided including that public exhibition events were taking place. These details were then broadcast that day as a part of a news bulletin update. Additionally, journalists attended the exhibition event on 2 July 2012 and took photographs of the event;
- Bilingual posters were posted to each of the exhibition venues on 25 June 2012 (provided in Appendix 13);
- A further press release was provided prior to the start of the public exhibition week providing details of the locations and the times of the event. A copy of the press release and an example press cutting is attached in Appendix 14; and,
- The Isycoed Newsletter carried details of the consultation and dates of the public exhibition events.

Public exhibitions

- 4.26 Public exhibition events were held across five days in venues that were in close proximity to the Wrexham Industrial Estate or the WEC's infrastructure connections. Events took place between 2pm and 8pm on the following days and locations:

- Monday 2 July 2012 – Marchwiel Community Hall, Piercy Avenue, LL13 0RH

- Tuesday 3 July 2012 – Rhostyllen Parish Hall, Vicarage Hill, LL14 4AR;
- Wednesday 4 July 2012 – Atrium Suite, Redwither Tower, Wrexham Industrial Estate, LL13 9XT;
- Thursday 5 July 2012 – Stiwt Theatre, Broad Street, Rhosllanerchrugog, LL14 1RB; and,
- Friday 6 July 2012 – Parciau Community Centre, Bellevue Road, LL13 7NH.

4.27 A map showing the location of the five venues is provided in Appendix 15.

4.28 A total of 120 consultees signed in to exhibition events and a headcount of 134 was taken.

4.29 A breakfast event was also held for local businesses and key stakeholders on Wednesday 4 July 2012 at Redwither Tower at the Wrexham Industrial Estate. This was to allow businesses on the Wrexham Industrial Estate an opportunity to discuss the plans with the project team. Local ward councillors, Welsh Assembly Members and Members of Parliament were also invited to this event.

4.30 At each of the events listed above, attendees could view a series of bilingual exhibition boards that detailed the proposals and explained the context in which the project was being brought forward, allowing consultees to provide informed feedback. In summary, the exhibition boards:

- welcomed attendees and introduced the day's event and WPL;
- explained what the WEC was;
- set out why new generation is required;
- explained how the WEC would function;
- described what a similar CCGT looks like;
- set out the benefits that could be brought to Wrexham and the Wrexham Industrial Estate;
- detailed WPL's preferred site and invited comments on other sites considered;
- demonstrated how the WEC could be orientated on the preferred site;
- mapped areas in which the gas and electrical connections could be made;
- explained how feedback could be submitted and the role of PINS; and,
- set out the next steps and timeline for the project.

4.31 Copies of the exhibition boards are provided in Appendix 16.

4.32 Printouts of the supporting documentation and plans were made available and members of the project team were on hand, including a Welsh speaker, to answer questions. At each event, attendees could complete a feedback form in English or in Welsh or return a completed form via the project's freepost address. Those who completed the feedback form at the event could post a copy into a ballot box available at each event. A copy of the English feedback form is provided in Appendix 17. A copy of the Welsh feedback form is provided in Appendix 18.

Presentations and meetings

4.33 Presentations, which included a Question and Answer session, were given to the following community councils, which are located within the core consultation zone and who had meetings scheduled during the consultation period:

- Abenbury Community Council – Wednesday 11 July 2012;
- Isycoed Community Council – Tuesday 17 July 2012; and,
- Sesswick Community Council – Thursday 19 July 2012.

4.34 These presentations were arranged with community councillors or the relevant council clerk and their purpose was to provide a further channel of information to the community as well as providing an opportunity to focus on project issues that affected their locality. The presentation introduced WPL, the national energy scene, the WEC, the benefits it could bring to Wrexham, how the WEC could function, key elements of the proposed design and appearance, the consultation that was underway and the expected timeline for the delivery of the proposals.

4.35 In addition to the engagement with community councils, meetings and presentations to introduce the project and explain the purpose of the consultation, were held with key individuals, elected representatives, and businesses, as set out chronologically below:

- The Planning Inspectorate – Friday 15 June 2012;
- Kellogg's – Friday 6 July 2012;
- Ian Lucas MP – Friday 12 July 2012;
- Prysmian Cables – Friday 20 July 2012;
- Lesley Griffiths AM – Friday 20 July 2012;
- Cllr Neil Rogers, Wrexham Council Leader – Wednesday 5 September 2012;
- Susan Elan Jones MP – Wednesday 12 September 2012;
- Countryside Council for Wales and the Environment Agency – 26 September 2012;
- Presentation to businesses on the Wrexham Industrial Estate on energy supply and usage – 27 September 2012;
- Ian Lucas MP, Lesley Griffiths AM, representatives of Yale College and representatives of Glyndwr University, regarding potential future vocational training and employment – 27 September 2012;
- National Trust Erddig – 27 September 2012;
- AST Plastics, a significant power user with expansion plans – 28 September 2012; and,
- Ken Skates AM – 28 September 2012.

Inspection copies

- 4.36 Consultation documentation was provided on the project website, www.Wrexham-Power.com, and at the public exhibition events. As WPL was not undertaking formal consultation, a formal notice of deposit locations was not produced, however information was provided on the website and could be issued in paper format on request. At the formal stage of consultation, deposit locations will be agreed with WPL and advertised in the manner prescribed in the Planning Act 2008.

Hard-to-reach groups

- 4.37 In addition to acknowledging the need to engage proactively with those groups and individuals who traditionally fall within the definition of 'hard-to-reach', WPL recognises that those living in more isolated rural areas could also be considered 'hard-to-reach' due to their separation from the wider community. WPL therefore expressly sought a distribution company with experience of delivering information to isolated properties. Despite this, while the majority of consultees received the project information leaflet, some told WPL they had not. WPL will therefore review its approach to leaflet distribution to seek to reduce this. The team remains open to presenting to groups who may require information in a different manner and will take Wrexham CBC's advice on such initiatives.

Feedback

- 4.38 During the consultation period, consultees were invited to provide written feedback using feedback forms which were available at the public exhibition events and could also be filled in online through the project website. A total of 25 paper feedback forms was submitted at the events with a further 35 online feedback forms completed, either on a laptop available at the events or after the events.
- 4.39 Feedback could also be submitted via:
- a Freepost address
 - a Freephone project number
 - a project email address.
- 4.40 The feedback received during the public exhibition events was recorded and immediate questions posed to the team were answered. Written feedback and questions have been addressed in this feedback report.

4.41 WPL provided the following freepost address:

Wrexham Power Limited
Local Dialogue LLP
FREEPOST NAT3717
London
SE1 2BR

4.42 Consultees could also call 0800 319 6185, Monday to Friday between 9:00am and 5:30pm and speak to a member of the project team, or email info@Wrexham-Power.com with their feedback.

4.43 The feedback received during the consultation period, and further feedback received to the end of September 2012, is summarised in this report. WPL's initial responses to the questions posed are provided in this report.

5. Summary of feedback

Introduction

- 5.1 This section summarises the key areas on which feedback was received and WPL's initial response. The responses to individually submitted feedback can be found in the appendices of this report (Appendices 21 to 34).

Breakdown of feedback received

- 5.2 The table below details how feedback responses were received by WPL and the total numbers received.

Method of feedback	Total
Feedback forms (paper copy)	25
Feedback forms (online)	35
Phone calls	19
Emails (including letters submitted as attachments)	42

Recording and analysing feedback

- 5.3 The feedback received by the project team has been considered by WPL. Emailed feedback and completed feedback forms have been kept on file, phone conversations have been logged and verbal feedback supplied at exhibition events has been recorded in note form. The summary of the verbal exhibition feedback and WPL's initial response can be found in Appendix 32.
- 5.4 WPL has taken account of the frequency of comments made by consultees on the following elements of the proposed WEC and its connections:
- the choice of site
 - the orientation of the power station infrastructure on the preferred Kingmoor Park South site
 - the selection of a route corridor for the electrical connection to National Grid's Legacy Substation, 1.3km west of Rhostyllen
 - the selection of a route corridor for the connection to the national gas transmission network.

- 5.5 WPL will take account of the feedback submitted by consultees on the WEC and its associated connections.
- 5.6 The responses provided by WPL are initial ones and it continues to review, and have regard to, the responses received from consultees in developing the design of the WEC and its associated connections.

Main topics of feedback received

- 5.7 The table below summarises the main topics of the feedback received via completed feedback forms, logged phone calls and emails and provides WPL's initial responses. WPL's responses to individual feedback can be found in the appendices of this report.

Main topic	Frequency	WPL's initial response
Preference of routing the electrical connection through the South Corridor, due to the presence of an existing 132kV overhead line, over a new connection in the North Corridor.	17	WPL will have regard of feedback received on each of the corridor options for the electrical connection. The South Corridor affords the opportunity to run an electrical connection alongside the existing 132kV overhead line.
Visual effect of the electrical connection to National Grid's Legacy substation.	15	The visual effects of the proposals will be considered in the landscape and visual assessment, the results of which will be consulted on at the next stage of consultation.
Health concerns around electromagnetic fields (EMF).	15	The design will meet the requirements of the Health Protection Agency, UK government and International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines.
Environmental effect of the WEC.	14	An environmental impact assessment will be undertaken which will include air quality and emissions analysis. The power station can only begin operation with an Environmental Permit that regulates the emissions of the power station.
Support for the WEC and the preferred Kingmoor Park South	12	The WEC and its site have drawn support from local businesses and members of the community.

site.		
The selection of sites other than preferred Kingmoor Park South for the WEC, including the former Firestone Factory site and locations not on the Wrexham Industrial Estate.	12	The Firestone site has greater ecological sensitivities than the preferred site and is adjacent to the Pentre Maelor residential neighbourhood. These points have been taken into account when choosing the preferred power station site. However, WPL will have regard to consultation responses on all three sites before WPL makes its site choice. A site selection report will be provided in the Environmental Statement.
Visual effect of the WEC due to building massing.	11	The existing buildings on the Wrexham Industrial Estate, the industrial allocation in the UDP and the extant planning consent for a 500,000 sq ft high bay industrial/warehouse building on the preferred site set a visual precedent for the WEC. If there is a visual impact, this will be mitigated through design.
Carbon Capture and Storage (CCS) and its role given national uncertainty around its adoption.	10	At present, carbon capture technology has yet to be made commercially viable but there is a requirement to set land aside for future carbon capture and storage (CCS) equipment. Carbon would not be stored at the power station site, rather it would be transferred from the CCS equipment by underground pipeline to a storage facility, potentially under the Irish Sea. The obligation to demonstrate Carbon Capture Readiness (CCR) on power stations with a capacity of more than 300 MWe is determined by DECC as set out in a Guidance Note which can be found in the project library on WPL's website – www.Wrexham-Power.com. In accordance with the Guidance Note, WPL will set aside 4 hectares (10 acres) for this purpose.
The potential effect	9	At this early stage, this effect cannot be

of the WEC and its associated connections to the national electricity and gas connections on local property values.		accurately gauged as detailed designs have yet to be produced. However the preferred Kingmoor Park South site's location on the Wrexham Industrial Estate provides the appropriate industrial visual and physical setting for the WEC, especially when considering an existing consent for a 500,000 sq ft high bay warehouse already exists for the site. WPL will take into consideration the location of local property when routeing the electrical connection.
Preservation of Rights of Way.	4	An environmental impact assessment including a landscape and visual impact assessment and an assessment of the impact, if any, on Rights of Way, will be undertaken.
Expanding the district heating system to the wider area.	3	The viability and potential extent of a district heating system is being investigated as part of the detailed analysis of the proposals being carried out.

Feedback on WPL's preferred site, Kingmoor Park South

- 5.8 WPL's preferred site for the WEC is Kingmoor Park South, Bryn Lane, the site of a former fiberglass factory. There is presently consent on this site for a 500,000 sq ft high bay industrial warehouse/distribution centre.
- 5.9 The preferred site, along with Kingmoor Park North (adjacent to Kingmoor Park South) and the former Firestone Factory site, were considered as potential locations for the WEC and therefore WPL asked for feedback on these locations.
- 5.10 Consultees were asked for their general comments on each of these sites. In wider discussions with key stakeholders, the preferred Kingmoor Park South site was found to be the most suitable location for the WEC. However, in a small number of cases, consultees suggested another site as being their preference. Of the 60 completed paper and online feedback forms submitted to WPL, only eight (13%) recorded a preferred site for the WEC. Of these eight, three recorded a specific preference for Kingmoor Park South, one recorded a specific preference for Kingmoor Park North and four recorded a preference for the former Firestone Factory site. Additionally, four respondents suggested other locations outside of the Wrexham area. A summary of comments on the preferred Kingmoor Park South site and

WPL's initial response can be found in Appendix 21. A table of the comments received on the other sites examined by WPL is provided in Appendix 22.

- 5.11 It should be noted that, in discussion with residents of the village of Isycoed, there is a preference for the WEC to be located on the former Firestone Factory site, adjacent to the village of Pentre Maelor. This is primarily due to concerns around views of the WEC and its electrical connection from properties along the B5130, from Isycoed and from individual farmsteads to the northeast and east of the village and from the village of Holt.
- 5.12 Some consultees also suggested that WPL consider alternative locations where electrical transmission infrastructure already exists, but which are not on the Wrexham Industrial Estate, namely Connah's Quay and Deeside.

Preference of WEC infrastructure orientation at Kingmoor Park South

- 5.13 The feedback forms asked consultees for their preference on how future WEC infrastructure could be orientated on the preferred Kingmoor Park South site to inform the design of the WEC layout to be presented at formal consultation.
- 5.14 This infrastructure includes:
- heat recovery generators and stacks
 - turbine halls
 - transformers/substation
 - a demineralised water plant
 - water storage tanks
 - land set aside for carbon capture infrastructure
 - workshop and stores
 - a maintenance laydown area
 - a control and administrative building.
- 5.15 Three indicative layouts were provided, showing how the above infrastructure could be combined on the site. Plans presenting these layouts are provided in Appendix 20. The table below lists the layout orientation preference recorded by consultees in feedback forms and where mentioned in other written correspondence as well as a summary of the main themes of comments on each site. A table of comments received on these sites and WPL's initial response is provided in Appendix 23.

Layout	No. of preferences	Summary of comments
East/west layout	6	Overall less visual effect on surrounding area Closer proximity to the Wrexham

		Industrial Estate
North/south layout	2	Less visual effect on residents to the northeast of the site
Northeast/southeast layout	3	n/a

5.16 The east/west layout is the most preferred layout in the written feedback received. This option locates the taller, and therefore more likely to be visible, infrastructure towards the Kingmoor Park South site's boundary with Bryn Road and Wrexham Industrial Estate.

5.17 General comments supplied on the site layouts include:

- the final layout of the site should consider wind direction
- steps should be taken to lessen the view of the proposed power station onto properties to the northeast of the site
- that a sufficient buffer area be created to the east of the site, between the WEC and existing properties.

Preference between the North and South corridors for the electrical connection

5.18 Consultees were asked to provide feedback on the location in which a high voltage overhead line connection to National Grid's Legacy Substation, 1.3km west of Rhostyllen, could be made. Two corridors were identified, a North Corridor and a South Corridor. The North Corridor passes through an area where there is no existing electricity transmission infrastructure, while the South Corridor mainly follows the route of an existing 132kV overhead line. The preferences from the corridors supplied in written feedback are provided below and are also provided in Appendix 24.

Corridor Option	No. of preferences
North Corridor	1
South Corridor	17

5.19 Consultees were also asked for comments on the North Corridor and the South Corridor. The main themes and preferences are provided below. A full summary of individual responses can be found in Appendix 25.

Comment	WPL's initial response
Protecting undeveloped land by running a new connection alongside the route of an existing 132kV connection to the Wrexham Industrial Estate.	The South Corridor provides an opportunity to develop an electrical connection mainly along the route of the connection currently supplying the Wrexham Industrial Estate.

Visual impact of the electrical connection be lessened or that undergrounding be considered.	An environmental impact assessment and a landscape and visual impact assessment will be undertaken to assess the impact of the WEC and any new infrastructure. While it is appreciated that an underground connection may be considered a popular option, the cost of doing so would render the project commercially unviable. It would also present operational obstacles when it comes to maintaining the connection and fault checking. Undergrounding causes greater environmental and ecological harm due to the need to excavate a corridor with a width of between 30 to 40m. This could be wider to account for physical constraints such as roads or watercourses.
Health concerns around electromagnetic fields.	The design will meet the requirements of the Health Protection Agency, UK government and International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines.

Preference between the East and West corridors for the gas connection

5.20 Consultees were asked to indicate their preference between two options for the route of a gas pipeline connection to the former Maelor Gasworks, the East Corridor and West Corridor. The responses are summarised below and summary of the main comments received around the sites is provided. This table is also provided in Appendix 26.

Corridor Option	No. of preferences	Summary of feedback
Eastern Route	4	Seems to be the least disruptive.
Western Route	3	Impacts least on residents. Provides better access to the Maelor Gasworks.

		The route of the gas pipeline passes through an area of former mining works so care should be taken.
--	--	--

5.21 Overall, there is a marginal preference for the Eastern Route over the Western Route. The individual feedback on these sites and WPL's initial response can be found in Appendix 27.

The overall project and general feedback

5.22 Consultees were asked 'Which element of the project most interests you?' in the feedback form. The table below shows that consultees were most interested in the power station and its electrical connection (Appendix 28).

Element of the proposals	Preference
The power station	12
The electrical connection	12
The gas connection	5

5.23 WPL's response to general project comments submitted via the feedback form is provided in Appendix 29.

Logged phone calls

5.24 A total of 19 phone calls relating to the consultation were received. A log of these phone calls and WPL's initial response is provided in Appendix 30.

Emailed feedback

5.25 A total of 42 emails providing consultation feedback were received. These emails and WPL's response to individual points are provided in Appendix 31.

5.26 At its meeting on 17 July 2012, Isycoed Community Council submitted a list of questions to WPL. WPL's initial response to these questions is given in Appendix 33.

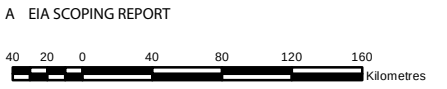
6. Conclusion

- 6.1 Over the course of consultation, 134 individuals visited exhibition events, 1,467 visits were made to the project website, 60 feedback forms were returned to the WPL team, 42 emails were received, 19 consultation phone calls were logged and meetings were held with key individuals, community councils and organisations.
- 6.2 Through this consultation activity, it has been established at this early stage that:
- the visual and environmental effects of the WEC need to be considered carefully in the design and environmental assessment of the project;
 - some consultees prefer other potential sites for the WEC, predominantly the former Firestone Factory site. This preference comes particularly from the villages of Isycoed and Holt and the area around them;
 - from those expressing a preference, there is a clear preference for an electrical connection to be made within the South Corridor (one of two options proposed);
 - the visual and environmental effect of the proposed electrical connection needs to be considered carefully in the design and environmental assessment of the project;
 - there is a slight preference for a gas connection to be made within the East Corridor (one of two options proposed);
 - there appears to be less interest in the gas connection element of the proposals than the WEC itself and its electrical connection; and,
 - the potential commercial and energy supply benefits of the WEC are acknowledged by businesses on the Wrexham Industrial Estate and more widely.
- 6.3 The design of the WEC and its connections is being considered in light of the above and how WPL has had regard to this feedback will be explained at the following formal stage of consultation.
- 6.4 Generally, there is support for the project amongst local businesses and residents and an appreciation of the economic benefits it will bring. However, the effect of the WEC on individual businesses is being discussed with the relevant parties.
- 6.5 The majority of concerns received have emanated from those living in proximity to the preferred WEC site, Kingmoor Park South, and within the electrical connection route corridors identified.
- 6.6 The next phase of the project will see detailed designs produced and consulted around in accordance with Sections 42, 47 and 48 of the Planning Act 2008.

Appendix 4: Phase 1 habitat plan



- Site boundary
- Parkland/Scattered broad-leaved trees
- Unimproved Neutral Grassland
- SI Semi-Improved Neutral Grassland
- A Amenity Grassland
- Ruderals
- Dense/continuous Scrub
- Scattered Scrub
- Swamp
- Standing Water
- Marsh/marshy Grassland
- I Improved Grassland
- SI Poor Semi-Improved Grassland
- Bare Ground
- Ephemeral/Short Perennial
- Spill
- Buildings
- Hardstanding
- A Arable Land
- Intact hedgerow
- Intact hedgerow with hedgerow trees
- Defunct hedgerow
- Water filled ditch
- Dry ditch
- Road
- Fence



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationary office. Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. CLIENT NAME. Licence number XXXXXXXX

Atkins Limited ©
Consulting Engineers
The Hub
500 Park Ave,
Bristol, South Glos.,
England, BS32 4RZ
Tel: +44(0)1454 662000
Fax: +44(0)1454 663333
www.atkinsglobal.com

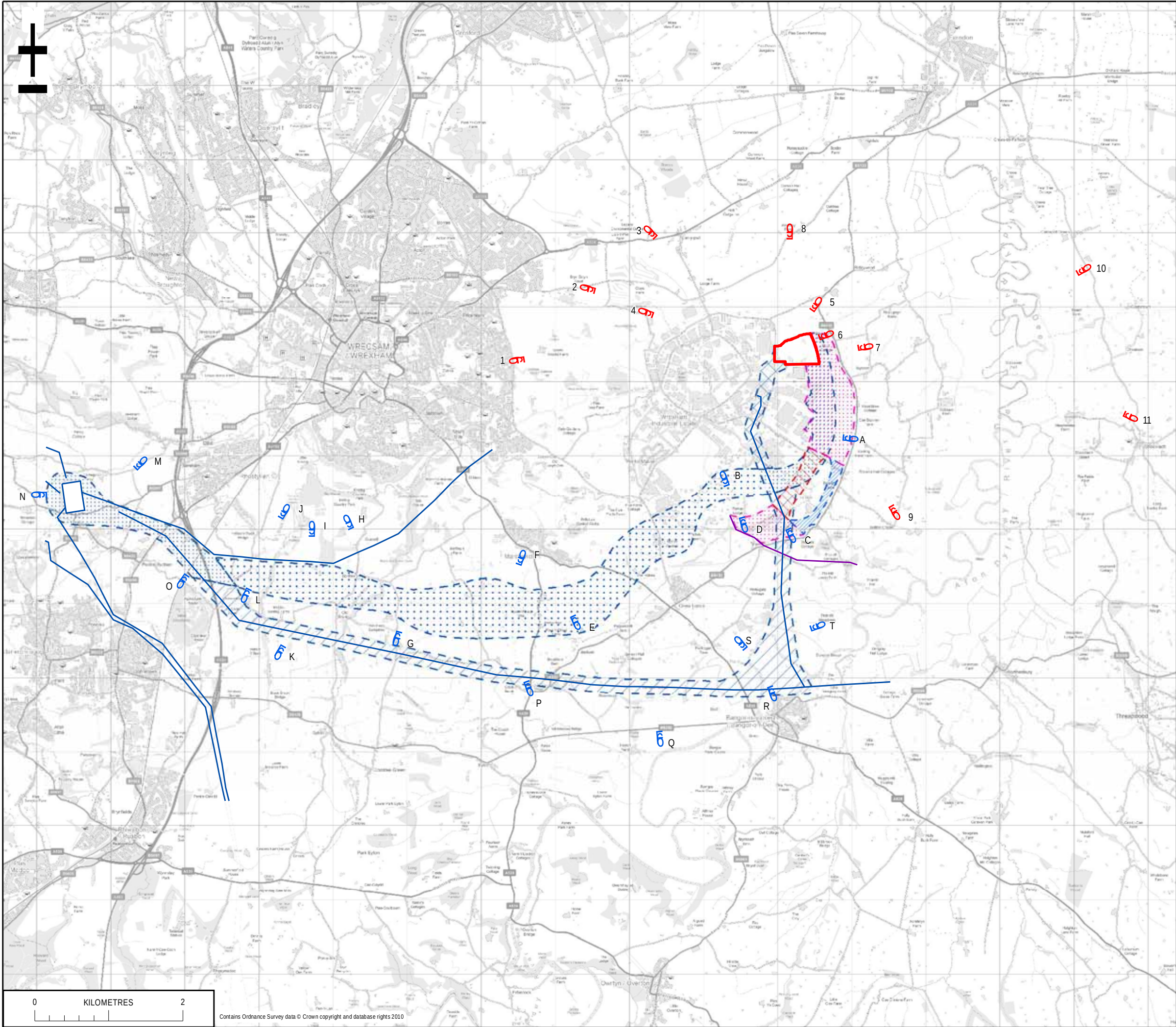
Client
WREXHAM POWER LIMITED

Project
**CCGT POWER STATION
AND CONNECTIONS**

Title
PHASE 1 HABITAT SURVEY PLAN

Sheet Size	Original Scale	Designed/Drawn	Checked	Authorised
A3	NTS	GB	PW/LG	CL
Drawing Number		Date	Date	Date
5105324/WRX/ ENV/003		10.2012	10.2012	10.2012
Rev				A

Appendix 5: LVIA provisional viewpoints



ATKINS

- NOTES
1. DO NOT SCALE FROM THIS DRAWING.
- KEY
- Proposed Power Station Site
 - Legacy Substation
 - Existing Overhead Line
 - Existing National Transmission System Pipeline
- Electrical Grid Connection - Indicative Route Corridor
- Route Corridor Alternative Section
 - Route Corridor Common End Sections
 - Route Corridor Option A
 - Route Corridor Option B
- Natural Gas Connection - Indicative Pipeline Route Corridor
- Route Corridor Common End Sections
 - Route Corridor Option (East)
 - Route Corridor Option (West)
- CCGT Viewpoints
- Electrical/Gas Connection Corridor Viewpoints

ATKINS

Atkins Limited
Woodcote Grove
Ashley Road
Epsom, Surrey
KT18 5BW
England

Telephone +44(0)1372 726 140
Fax +44(0)1372 740 055

CLIENT:

WREXHAMPOWERLIMITED

PROJECT:

CCGT POWER STATION AND CONNECTIONS

TITLE:

**EIA SCOPING
LANDSCAPE AND VISUAL IMPACTS
PROVISIONAL LOCATIONS FOR
REPRESENTATIVE VIEWPOINTS**

SCALE:	ORIGINAL SIZE:	ORIGINATOR:	CHECKED:	REVIEWED:	AUTHORISED:
1:50,000	A3	SJD	IEW	CL	CL
	OFFICE:	DATE:	DATE:	DATE:	DATE:
	GBBMA	08-11-12	08-11-12	- -	- -
Project No:	Discipline:	Type:	Number:	Status/Rev:	
5105324	WRX	ENV	004	B	