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## 11.1 ECOLOGY

### 11.1.1 General Ecological Context

The proposals for the onshore components of the project are sited within an agricultural landscape comprising predominantly small fields of improved pasture and arable land. Field boundaries are predominantly species poor, defunct hedgerows or watercourses / field drains which form a network across the area. North of the A547 there are a few small and isolated woodlands and scattered trees with larger woodlands south of the A55 trunk road. There are a number of watercourses including the River Gele.

The coastal fringe is dominated by urban and recreational development with occasional areas of coastal habitat and some less intensively managed grassland.

### 11.1.2 Designated Sites

#### *Statutory Designated Sites*

There are no statutory sites of nature conservation value in close proximity to the proposals. The nearest site is Coed y Gopa Site of Special Scientific Interest (SSSI) that lies approximately three kilometres to the west at SH 938 766 (see section 7). This site is designated for its interest as a winter roost of lesser horseshoe bat and is a prominent carboniferous limestone hill with ancient woodland and calcareous grassland.

#### *Non-statutory Designated Sites*

The closest designated non-statutory site is Kimmel Bay Local Nature Reserve (LNR) (SH 987 806) which lies approximately two kilometres to the north-east of the proposals. This site comprises approximately 6.5 hectares of semi-natural sand dune community that supports the rare grass *Festuca arenaria* (rush-leaved fescue). The site has landscape value, access and is used for recreation.

A further eight proposed Wildlife Sites lie along, or within 2 km of the proposed route alignment (*pers comm* Conwy County Borough Council (CCBC), 2002) and North Wales Wildlife Trust (NWWT). We understand that these sites have been identified through a desk-based study that included a review of Phase 1 habitat maps produced by CCW, and did not involve any further site-specific analysis. In the future CCBC intend to undertake further evaluation of the sites to assess their suitability for designation as Wildlife Sites and to define boundaries. Excepting the grid references, little or no information was available from CCBC on the nature conservation interest of these possible sites. The eight locations areas are:

- Afon Gele river/ditch system (SH 962 785) which is crossed by the proposed alignment;
- Coed Parc-y-Meirch/Coed y Meibion woodland (SH 974 755);
- SH 966 761 <sup>(1)</sup>;
- SH 981 786;
- SH 974 781;
- SH 979 780;
- SH 973 768; and
- SH 972 765.

### 11.1.3 *National and Local Biodiversity Action Plans*

The following sections discuss the habitats and species identified during the EIA studies (including consultation and survey work), which have a biodiversity action plan at a national or local level <sup>(2)</sup>.

#### *National Biodiversity Action Plan*

National BAPS have been developed for one habitat type (species-rich hedgerows) and several animal species (pipistrelle bat, water vole, otter, and a number of farmland birds). An overview of the aims of these National BAPs is provided below <sup>(3)</sup>.

- *Species-rich Hedgerows*. Since 1945 there has been a drastic loss of hedgerows through removal and neglect throughout the UK. The action plan aims to halt all loss of ancient and species-rich hedgerows, achieve favourable management of species-rich and ancient hedgerows and maintain the overall number of hedgerow trees. The retention and favourable management of hedgerows is to be encouraged in order to meet the aims of the plan.
- *Pipistrelle Bat* populations have declined due to the loss of insect prey habitat and the loss or disturbance of roost sites. The action plan aims to maintain and increase existing populations of pipistrelle and their range. Actions to meet these objectives include encouraging water quality levels which will support populations of aquatic insect prey and encouraging favourable management of land adjacent to known roost sites to support foraging by juveniles.
- *Water vole* has suffered a significant decline in numbers and distribution throughout Britain due to the loss and fragmentation of habitats, disturbance of riparian habitats, predation by mink and the pollution of

(1) This may be woodland at Coed Parc-y-Meirch (see Section 11.1.5).

(2) Government and its advisors have developed national actions plans to conserve habitats that are threatened and species that are in significant decline. Local plans translate these plans into actions for specific areas within the UK.

(3) Further information on the current status, factors affecting the habitat and current action plan objectives and targets for habitats can be found on the Action Plan website: <http://www.ukbap.org.uk/plans/ha> and the current status, factors causing loss or decline and current action plan objectives and targets for species can be found on the UKBAP website at <http://www.ukbap.org.uk/plans/sp>.

watercourses and poisoning by rodenticides. The action plan aims to maintain the current distribution and abundance of this species in the UK and to ensure that they are present throughout their 1970s range by the year 2010. The promotion of favourable management of riparian habitats to favour water vole is one of the actions being promoted to achieve the aims of the plan.

- *Otter* underwent a rapid decline in numbers from the 1950s to 1970s, though the decline now appears largely to have halted (Andrews *et al*, 1993; Morris, 1993; Mammal Society, 2000) . Current factors causing loss or decline include the pollution of water courses, insufficient prey due to poor water quality, impoverished bankside habitat features needed for breeding and resting as well as incidental mortality such as road deaths. The action plan objectives are to maintain and expand existing otter populations and to restore breeding otters to all catchments and coastal areas where they have been recorded since 1960 by 2010. One of the measures to achieve the aims of the objectives is to secure appropriate management of riparian habitats and catchments in woodlands.

*Local Biodiversity Action Plans (LBAP)*

- **Conwy County Borough Council (CCBC)** – has developed a list of Species and Habitat Plans for inclusion in the first tranche of the Conwy LBAP. The details of the action plans are not yet available. Those habitats and species identified as requiring an action plan within the study area are listed below.

Habitats	Species
Unimproved neutral grassland; Semi-natural woodland; Species-rich hedgerows; Standing open water; Rivers and streams.	Bats; European otter; Water vole; Badger; Great crested newt; Red List farmland birds (eg grey partridge, skylark, tree sparrow, linnet and corn bunting)

- **Denbighshire County Council (DCC)** - a draft LBAP framework document has been developed. The only UK priority habitat listed in the plan that was identified in the study area is ancient and/or species-rich hedgerow. UK priority species identified include water vole, pipistrelle bat, lesser horseshoe bat, otter, great crested newt and a number of Red List farmland birds.

**11.1.4** *Species of Note*

*Flora*

Available species records and consultations with the relevant organisations listed in *Section 10.2* including BSBI, NNWT and CCW, indicate that there are

no known plant species of international, national or county importance which are likely to be affected by the proposals.

### *Fauna*

Historical records and consultee responses (including those from CCW and the Clwyd Bat Group) indicate that there are a number of protected species <sup>(1)</sup> within the study area.

### *Water Vole*

There are historical records of water vole presence in the area (CCW, 1998) (see *Figure E2.1, Annex E*). Consultation with CCW and the EA also indicated that water vole are present in the study area.

### *Otter*

The current Otter Survey of Wales (1991) indicates that otter numbers and their range in the Clwyd area are both on the increase. Sites with positive survey results increased from 33% to 63% between 1984-85 and 1991. Now some years later there is a strong possibility that otter has spread along the tributaries of the River Clwyd (where otter have been recorded), including the River Gele.

There are records of otter on the River Clwyd (*pers comm* M Ellis, 2002). There are no records of previous survey work on the River Gele and agricultural drains in the study area, but consultation with Conwy County Council and NWWT suggest that otter may use them.

### *Badger*

The Clwyd Badger Group was contacted, but was unable to provide any relevant records of badger activity in the area.

### *Bats*

Recent records from the Clwyd Bat Group (*pers comm*. Clwyd Bat Group, 2001), indicate that there are pipistrelle bats in the Towyn area. These records also identify a significant roost site supporting Natterer's bats at Gors Cottage (SH 976 781); the bats from this roost use Gors Wood for feeding. A number of buildings in this area are known to support bat roosts. The Clwyd Bat Group did not identify any individual tree roosts in the survey area.

### *Birds*

- *Wintering and Passage Birds*

(1) Protected under the *Wildlife and Countryside Act, 1981 and amendments*.

The main concentrations of birds during the winter and passage periods are along the coastal fringes. The review of the WeBS <sup>(1)</sup> data revealed that the Clwyd Estuary supports a range of wildfowl and wader species, but only two species, cormorant and common scoter, occur in nationally important numbers (see *Annex E*). In comparison Colwyn Bay generally supports fewer species of waterfowl and lower numbers in sectors that lie within 2 km of the proposed route corridor. However, common scoter, which occurs offshore, does occur in nationally important numbers (see *Annex E*). The main concentrations of waterfowl, have been reported further west in the Abergele-Llanddulas sector.

- *Breeding Birds*

The proposals will result in the loss of only small areas of habitat of low nature conservation value and the main impacts are considered to be from the overhead lines once operational. Hence this assessment has, therefore, sought to identify key species which could be affected.

A review of the breeding bird atlas (Gibbons *et al.* 1993) revealed a total of 98 bird species breeding, or possibly breeding, within the 10x10 km square in which the proposed substation and overhead electricity line route are situated. For the purposes of this assessment, all of these records have been considered. A review of this list against the findings of the habitat survey along the route corridor and of the local bird reports suggested 92 of these species could occur within habitats along or in close proximity to the route corridor (see *Annex E*).

Thirty three of these species are of conservation importance including four protected species (peregrine, quail, barn owl and kingfisher) (see *Annex E*). A further eight species (turtle dove, skylark, song thrush, spotted flycatcher, tree sparrow, linnet, bullfinch and reed bunting) are classed also as medium sensitivity, as a result of their inclusion on the UK Biodiversity Action Plan (BAP) priority species list. In addition to the above species, the raptor group has identified the potential use of the area by sparrowhawk, buzzard and hobby as well as large non raptor species such as mute swan, Canada goose and raven.

The information from the review does not suggest that there are any breeding bird species that occur in nationally, or regionally important numbers and the habitats along the route corridor are all common in the area.

#### *Great Crested Newt*

Historical records of great crested newt (CCW, 1993) exist at four locations approximately two kilometres east of the proposals, see *Figure E2.1, Annex E2*.

(1) Wetland Bird Survey, a joint scheme of the British Trust for Ornithology (BTO), The Wildfowl and Wetlands Trust (WWT), Royal Society for the Protection of Birds (RSPB) and Joint Nature Conservation Committee (JNCC) to monitor non-breeding waterbirds in the UK.

CCW was of the opinion that, whilst there were no confirmed records along the route of the electricity line or at the substation, it was possible that great crested newts used the area (*pers comm* M Ellis, 2001). They requested that an evaluation be carried out to assess the potential of the area to support this species.

Consultation with the relevant organisations suggests that no other amphibian, or reptile species of interest have been recorded in the vicinity of the proposals.

#### *Invertebrates*

No historical records of terrestrial invertebrate species of interest were provided by consultees. An invertebrate survey was not considered necessary due to the small scale of the habitat loss and the low nature conservation value of the habitats that would be affected.

Records of freshwater invertebrates were obtained from the Environment Agency (EA) and give an indication of water quality. An EA monitoring site lies on the River Gele 1.7 kilometres upstream of the proposals and there is another 2 km downstream. The most recent data available from the EA indicate that the Biological Monitoring Working Party (BMWP) score and Average Score Per Taxon (ASPT) for the two sample sites for the period 1988 – 1993 is presented in

*Table 11.1.*

**Table 11.1 EA Biological Monitoring Results - River Gele (BMWP and ASPT Scores <sup>(1)</sup>)**

Site Name	National Grid Reference	Biological Results	1988	1990	1991	1992	1993
R. Gele, @ Gravel Trap (Upstream of proposed facilities)	SH 9515 7775	BMWP	-	19	77	-	-
		ASPT	-	3.17	4.81	-	-
R. Gele, U/S Glascoed Water Treatment Works (WTW) (Downstream of proposed facilities)	SH 9911 7868	BMWP	65	69	-	81	74
		ASPT	4.06	4.05	-	4.26	3.7

Both BMWP and ASPT are relative measures of water quality. It is not possible to directly relate a given index value to an absolute level of pollution (Mason, 1991). Values need to be considered in the light of catchment characteristics *ie* a BMWP score of 90 may be considered reasonably poor for one site *eg* chalkland stream but good in another *eg* low pH headwater stream. In this case the watercourse is slower flowing on plain rather than the more active upper reaches, therefore will result in a slight reduction in the BMWP and ASPT scores. The results indicate a relatively low – moderate water

(1)BMWP scores are based on the varying degrees of tolerance shown by species and /or families to pollution (usually organic). Taxa sensitive to pollution are given a high score, tolerant taxa are given low scores. The sum of the scores of individual families recorded at a site constitutes the 'BMWP score'. The 'ASPT score' is calculated by dividing the BMWP score by the number of individual families recorded

quality. This watercourse is not monitored regularly by the EA and thus has not been assigned a grade that indicates its water quality. Neither is the data compared via a computer package (RIVPACS) with data for pristine watercourses. The data is believed by the EA to be typical of the watercourse and the area (*pers comm EA, 2001*).

### 11.1.5 *Habitat Survey Findings*

The Phase 1 survey did not record any plant species of importance. Phase 2 surveys were not undertaken. The following sections describe the existing habitat in the areas to be directly affected by the proposals and their immediate environs. The locations of habitats are shown on the Phase 1 Habitat Maps in *Annex E* together with the and the Target Notes.

#### *Grassland*

The majority of habitat in the survey area is improved grassland, predominantly grazed fields dominated by *Lolium perenne* (perennial rye grass), *Trifolium repens* (white clover), *Ranunculus repens* (creeping buttercup) and *Taraxacum officinalis* (dandelion), with few other species. This grassland habitat is considered to be of limited nature conservation value.

One area of less improved neutral grassland was recorded at SH 969 763 that was surrounded by dense hedges with mature trees and is dominated by *Holcus lanatus* (Yorkshire fog), *Ranunculus repens* (creeping buttercup) and *Cirsium spp.* (thistles).

One area of marshy grassland was recorded at SH 959 738 between Fynon Dyfyr and Glan Dyfyr (see *Target Note 35*). This is dominated by clumps of *Juncus effusus* (soft rush).

Along the coastal fringe there is a small area of sparse dune grassland which intermingles with shingle and pebbles. Typical species include *Tripleurospermum maritimum* (scentless mayweed), *Glaucium flavum* (yellow horned-poppy), *Plantago coronopus* (buck's-horn plantain), *Rumex crispus* (curled dock), *Beta vulgaris* (sea beet) with sparse clumps of *Ammophila arenaria* (marram grass) (see *Target Note 15*).

#### *Woodland and Scattered Trees*

Woodland in the survey area comprises both broadleaved and mixed types with a number of scattered trees, often along the line of former hedgerows.

There are several small and isolated broadleaved semi-natural woodlands in the survey area, as follows:

- Gors Wood (SH 975 780) dominated by *Quercus robur* (pedunculate oak).
- Coed Bodtegwal (SH 974 769), mature woodland dominated by *Quercus sp* (oak).



- A belt of woodland along the western edge of Parc-y-meirch quarry (SH 968 759) dominated by *Betula* sp. (birch), *Sorbus aucuparia* (rowan) and *Quercus* sp. (oak) (see *Target Note 20*).
- Coed Parc-y-Meirch (SH 965 759) (see *Target Note 23*) dominated by *Quercus robur* (pedunculate oak) and *Fraxinus excelsior* (ash). This wood and the contiguous Coed y Meibion is under consideration as a potential Wildlife Site (see *Section 11.1.2*).
- A small area of broadleaved semi-natural woodland (approximately 330m in length and 80m in width) present on land that slopes towards a stream (at SH 960 748), see *Target Note 28*. It is dominated by *Quercus* sp. (oak), *Salix* sp. (willow), *Fraxinus excelsior* (ash) and *Prunus spinosa* (blackthorn).

Several areas of mixed plantation woodlands are present to the south of the A55:

- Coed y Geufron (SH 963 760) (see *Target Note 19*), a mature mixed plantation woodland dominated by *Fagus sylvatica* (beech), *Quercus robur* (pedunculate oak), *Fraxinus excelsior* (ash) and *Acer pseudoplatanus* (sycamore), with some conifers in the western end of the woodland.
- Coed Pen-y-Bryn (SH 964 745) (see *Target Note 31*), a mixed plantation woodland dominated by *Quercus* sp (oak), *Fraxinus excelsior* (ash), *Fagus sylvatica* (beech) and *Acer pseudoplatanus* (sycamore), with conifers including *Pinus sylvestris* (Scot's pine) and other *Pinus spp.* (pine species) in the northern part of the woodland. To the south of the minor (Roman) road at SH 963 741 is mixed plantation woodland dominated by *Fagus sylvatica* (beech), *Fraxinus excelsior* (ash) and *Pinus sp* (pine).
- A strip of mixed semi-mature woodland (SH 969 763) runs along the boundary of a semi-improved field and links in with tall hedgerows around the field.

In addition there are a number of scattered trees, predominantly mature or semi-mature *Quercus* sp (oak) and *Fraxinus excelsior* (ash), that were recorded as individuals, or small groups, along field boundaries, as remnants of former hedge-lines. A stand of *Quercus* sp (oak) trees is present at the south-east corner of Coed y Geufron (see *Target Note 22*). These trees link in with a *Crataegus monogyna* (hawthorn) hedge running south from the woodland corner.

### *Hedgerows*

Hedgerows are sparse across the northern part of the survey area and are generally defunct. Towards the southern end of the proposals the hedgerows are more frequent and intact.

The majority of intact hedgerows are species-poor, dominated by *Crataegus monogyna* (hawthorn) and frequently heavily trimmed. Several include mature trees, mainly *Quercus sp.* (oak) with some *Acer pseudoplatanus* (sycamore) and *Fraxinus excelsior* (ash).

Two native species-rich hedgerows were recorded along both roads at SH 958 749 (see *Target Note 26*) and the semi-improved field at SH 969 763 that was surrounded by dense hedges up to 3 m in height (see *Target Note 17*).

Species-poor defunct/fragmented hedgerows were also recorded, indicative of a more extensive previous hedgerow network.

#### *Running Water*

The proposed route crosses the River Gele at SH 967 783. The river has been subject to some channel straightening and agricultural practices are generally carried out up to the bank of the watercourse. There is limited emergent and floating vegetation, with *Phragmites australis* (common reed) present at some points.

An extensive network of man-made field drains extends over much of the survey area, particularly to the north of the A55. The majority of channels are minor (approximately 1-1.5 metres wide), of variable water content at the time of survey. Several have been invaded by grasses and rushes, whilst others have become overgrown with scrub. Many of the channel banks have been poached by livestock where they adjoin improved pasture.

#### *Standing Water*

There are two ponds in the vicinity of the proposals as follows:

- (SH 967 766), a small pond which is heavily shaded and overgrown with *Salix spp.* (willows).
- (SH 959 738), a pond within the marshy grassland area (see *Target Note 35*).

#### *Urban / Quarry*

At the northern end of the route the land use is predominantly urban (at the outskirts of the town of Kinmel Bay), including holiday camps, caravan parks and related facilities. Further inland south of the River Gele there are isolated properties within a more rural landscape. Parc-y-Meirch limestone quarry is located at SH 968 759 (see *Target Note 20*).

To the east of the landfall there is an artificial break water comprising large calcareous boulders. These have been colonised by a range of common intertidal species *Enteromorpha sp* with a low density of *Fucus sp*, barnacles (*Porphyra*), rough periwinkle (*Littorina saxatilis*) and small periwinkle (*Littorina neritoides*) (see *Target Note 16*).

### 11.1.6 *Fauna Survey Findings*

#### *Water Vole*

The surveys recorded signs of water vole in several locations along the watercourses surveyed. Further details of water vole activity are provided in *Annex E*.

#### *Otter*

No signs of otter were identified in watercourses crossed by the proposals.

#### *Badger*

The surveys recorded considerable badger activity in the area and the findings are contained in a separate and confidential report (see *Section 10.2*).

#### *Bats*

The majority of habitat in the survey area is improved grassland, with some smaller areas of habitat more suitable for foraging bats. Drains in the area to the north of the A55 appear suitable as linear feeding habitat. The area to the south of the A55 also provides good foraging habitat, particularly the woodland parcels. The Clwyd Bat Group did not identify any individual tree roosts in the survey area and with the exception of an over mature oak that lies to the west of the route alignment (midway between Fairdrie Farm and Twll Dwr), the trees observed during the habitat survey did not appear to be suitable as bat roosts (as far as could be determined given access restrictions). Trees in woodland areas may, however, provide suitable sites.

#### *Great Crested Newt*

No newts were recorded from water courses, ponds or refugia. It was difficult to establish areas of suitable breeding habitat due to limitations of the methodology as outlined in *Section 10.2*. Those water bodies and water courses surveyed seemed unlikely to be suitable for newts for a number of reasons, including the presence of stickleback (that predate great crested newt larvae) in some of the ditches, lack of vegetation cover and lack of water in some of the minor ditches. No other amphibian or reptile species were recorded during the surveys.

#### *Other Fauna*

Several incidental records of common mammal species were made during the faunal surveys including, brown rat, fox, mole and small mammals. Few records of bird species were recorded in the Phase 1 survey records, although occasional waterfowl were recorded such as moorhen (Target Notes 5 and 6) and mute swan (P1 (Pond at SH 979 796) see *Annex E2*).

## 11.2 TERRESTRIAL ARCHAEOLOGY

### 11.2.1 *Geology, Topography and Landscape*

The grid connection for the wind farm crosses the low-lying Rhuddlan Marsh situated between Rhuddlan and Abergele that once formed the estuary of the Rivers Elwy and Clwyd. The basal geology here comprises Bunter Sandstone, pebble beds and basal breccias of the Triassic period above Millstone Grit deposits (*Geological Map of Great Britain, Sheet 2, 1:625 000 series*). To the south, the connection options rise up a ridge of hills trending west-north-west to east-south-east that rise to c. 150 m.

Creuddyn and Conwy, including Great Ormes Head and Little Ormes Head to the west of the Development Area, are included in the Register of Landscapes of Outstanding Historic Interest in Wales. To the south-west of the Land Study Area, the Lower Elwy Valley is included in the Register of Landscapes of Special Historic Interest in Wales.

### 11.2.2 *Known Sites*

The assessment collated details of 491 sites in the Land Study Area ranging from the Mesolithic to Modern periods. Ten Scheduled Ancient Monuments are located within the Land Study Area while three Historic Parks and Gardens registered within the Register of Parks and Gardens in Wales fall within the Area, see *Figure 11.1*.

Details of the sites are summarised in *Annex A*. The text below provides a chronological overview. Where relevant, site gazetteer numbers are provided in the text as references in parenthesis.

#### *Lower, Middle and Early Upper Palaeolithic (500,000 BC – 12,000 BC)*

There are no recorded finds predating the Devensian glaciation within the Land Study Area, though it is worth noting that the internationally important cave complexes of the Lower Elwy – which include evidence of human occupation up to 250,000 years ago – are located just south of the Land Study Area.

#### *Early Prehistoric (12,000 BC – 4000 BC)*

The earliest recorded finds within the LSA are from the Mesolithic period (8,500–4000 BC) and comprise the flint and chert sites (WA 202, 216) and finds (WA 189, 208) in the vicinity of Rhuddlan. An antler pick attributed to the Mesolithic is recorded from Splash Point (WA 359).

#### *Later Prehistoric (4000 BC – AD 43)*

The chambered tomb at Dinorben Lodge (WA 64) and the flint working site at Rhuddlan (WA 218) provide evidence of Neolithic (4000–2400 BC) activity

within the Land Study Area. Finds of Neolithic date have been found on the foreshore at Rhyl.

Again, as noted above, the Bronze Age (2400-700 BC) is represented by finds on Rhyl beach (WA 269) comprising a chisel and a socketed spearhead. These were found on an exposed peat bed just east of Splash Point in 1913.

The Iron Age (700 BC-AD43) is marked by the development of the first towns and the construction of large defensive sites (hillforts), however most of the countryside was still populated by isolated farms within their associated field systems. Only three records relate to Iron Age activity within the Study Area, including the hillfort at Dinorben (WA 67).

#### *Roman (AD 43- 410)*

The 43 records relating to Roman finds within the Land Study Area indicate both military and civilian occupation throughout the lower Clwyd valley. The Roman period in Britain is marked by the development of towns and an expansion of the farming base needed to support these urban populations. Here, the establishment of Rhuddlan as a trading centre upon the Clwyd (WA 190) and the fort of Varae/Varis at St Asaph (WA 479), which may have utilised the River Elwy for navigation into the Clywd, indicate permanent Roman settlement. Both Rhuddlan and Varae/Varis would have been connected to the network of Roman roads, the most prominent of which is now followed by the B5381 (and see, e.g. WA 125, 482, 123, 124, 155, 356, 464, 483, 487, 61). Other isolated Roman findspots recorded within the Land Study Area include a coin found on Rhyl beach (WA 272).

#### *Early Medieval (410-1066)*

The Early Medieval period is represented largely by the town defences developed at the Roman settlement at Rhuddlan and the Saxon burh of Cledemutha, located either adjacent to the Medieval town at Rhuddlan or at the mouth of the Clwyd (WA 253). The battle of Morva Rhuddlan, at which the Welsh were defeated by the Saxons under Offa, took place at the end of the eighth century.

The nucleus of modern Abergele was a seventh century Celtic monastic settlement situated on the lower reaches of the surrounding hills, away from the floods of Rhuddlan Marsh (Wynne Williams 1983). Abergele had developed into a trading centre for the area by the ninth century.

#### *Medieval (1066- 1499)*

The number of records indicating both religious and secular settlement sites within the Land Study Area reflects extensive occupation in the Medieval period. This includes continued occupation at Rhuddlan that by now had been established as a town with a mint and later as a Norman borough with a castle.

Abergele developed into a market town and by 1282 had a dovecote, mill and castle (Wynne Williams 1983). Medieval ecclesiastical sites include the cathedral at St Asaph (WA 363) and the church at Abergele (WA 442).

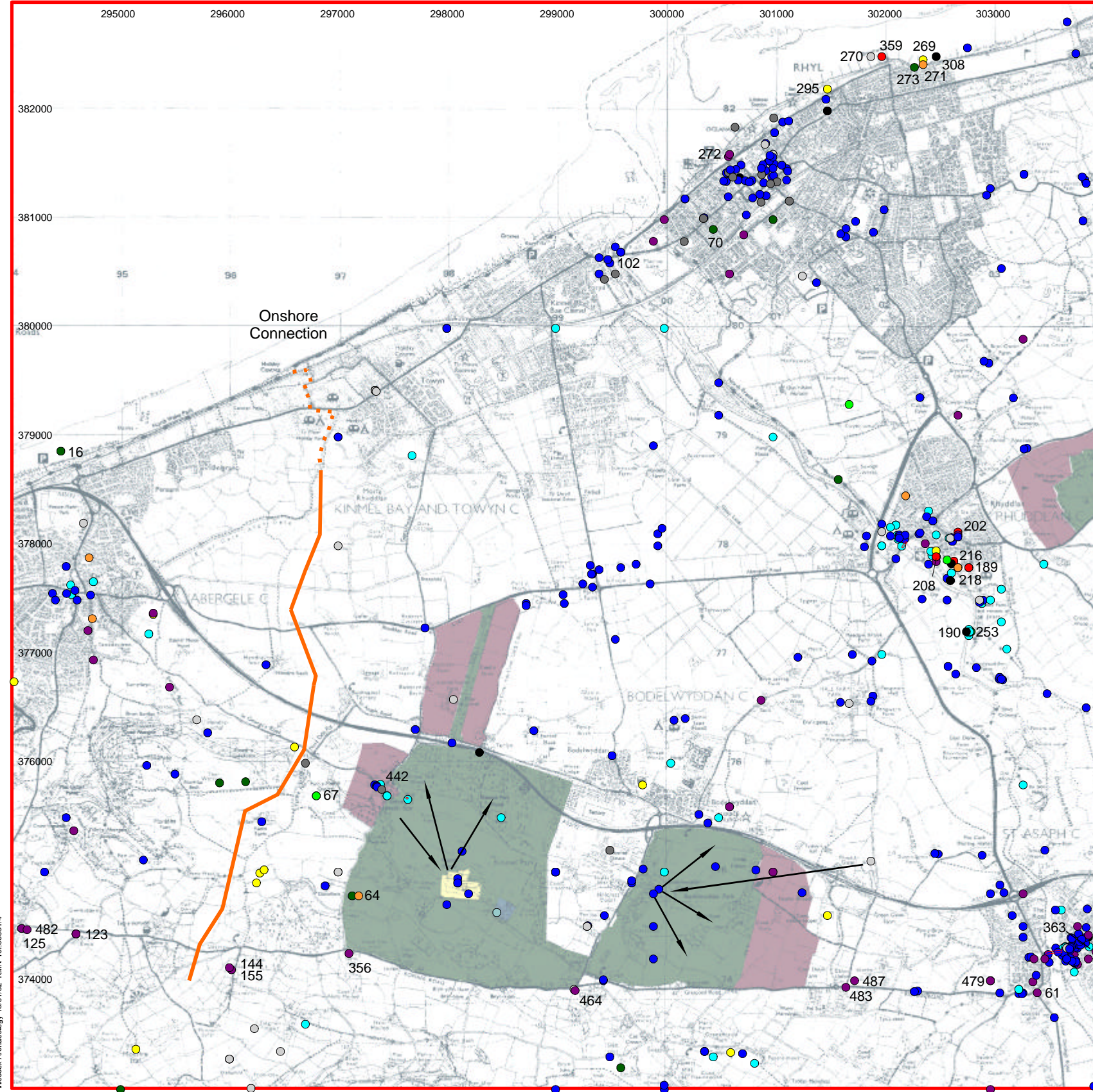
*Post-medieval and Modern (1500 – present)*

The large number of records relating to Post-Medieval sites and finds represents the largest body of archaeological evidence within the Study Area. The main features are undoubtedly the further development of Rhuddlan and Abergele, followed by the later development of Rhyl in the nineteenth century.

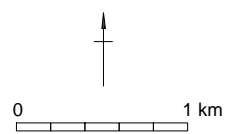
The First Edition OS demonstrates that Rhyl, Rhuddlan and Abergele formed the urban centres of the vicinity with a scattering of settlements between them. Elements of the road infrastructure on the First Edition OS survive within the modern layout and indicate that development within the area has been limited to the expansion of existing settlements and upon tracts of former marsh.

Rhyl was a small fishing port until early nineteenth century but by 1839 had become a seaside resort with many hotels and roads serviced by a regular steam packet service from Liverpool (Jones 1976). Its status was enhanced by the development of the railway network in 1848 that was laid behind a seawall built along coast to protect the line from the sea (Jones 1976).

Land Study Area



Wessex Archaeology 18/01/02 KMN ref 50081/4



- |                         |                 |                     |
|-------------------------|-----------------|---------------------|
| Location of known sites |                 | Parks and gardens   |
| ● Mesolithic            | ● Medieval      | ■ Parkland          |
| ● Neolithic             | ● Post-medieval | ■ Kitchen Garden    |
| ● Bronze Age            | ● Modern        | ■ Garden            |
| ● Iron Age              | ● Multi period  | ■ Essential setting |
| ● Prehistoric           | ○ Undated       | → Significant views |
| ● Romano-British        |                 |                     |

Figure 11.1  
Known Archaeological Sites on Land

Abergele developed after 1774 with the arrival of the mail coach and the area developed as a small resort (Wynne Williams 1983). This led to a rapid increase in population. However, the town lost out to other North Wales resorts in the mid nineteenth century and never developed as Rhyl did. It was only in mid twentieth century that the area developed as a large holiday resort (Wynne Williams 1983).

### 11.2.3 *Archaeological Potential*

Aside from the potential of the principal settlements within the Land Study Area, which are not implicated by the development proposals, archaeological potential can be addressed in terms of three zones:

- Rhuddlan Marsh;
- areas of higher ground to the south of the marsh; and
- the Roman Road.

The archaeological potential of Rhuddlan Marsh comprises three elements. At or near to the surface there are likely to be features relating to the Medieval (and later) reclamation of the marsh and its subsequent inhabitation. Some features of the present landscape, such as field boundaries and drainage ditches, may be of considerable age and importance to dating the history of reclamation and land use. Below the surface, it is conceivable that wrecked vessels and maritime structures predating the reclamation may survive within marine sediments. Below any such marine sediments, it seems likely that prehistoric landsurfaces and deposits predating marine inundation may survive. Prehistoric sites and structures may be associated with these deposits, which will also be of palaeo-environmental interest.

The higher ground to the south of Rhuddlan Marsh will not have been subject to the gross changes of the marsh, but the relative stability of the landforms may have made them particularly attractive for settled inhabitation. Their attractiveness would have been enhanced by their proximity to the marsh, whether it was a coastal lowland, open estuary or fertile plain.

The Roman Road warrants specific reference because sites of that period (and later) are likely to have clustered along it, as is already apparent to some extent from previously recorded sites.

### 11.2.4 *Previous Disturbance*

The main forms of previous disturbance likely to have occurred in the Land Study Area are construction and agriculture. Although construction and agricultural activities have become most damaging to archaeological material following mechanisation, it is worth noting that comparable activities in historic and prehistoric periods will have damaged any earlier underlying sites. Hence Medieval reclamation of Rhuddlan Marsh may have caused the truncation by ditches of prehistoric sites and land surfaces, and organic deposits may have degraded as a result of changes in drainage. Similarly, the



continuing attractiveness of the higher ground are likely to have caused intensive use and re-use, such that earlier remains have been severely disrupted. Re-use of the Roman Road from the time of its construction through to the present is likely to have caused substantial damage both to its original structure and to roadside sites.

Notwithstanding such disturbance, the continued presence of identifiable sites in the landscape and occasional discoveries of artefacts indicates that some sites of archaeological interest have survived in reasonable condition. Locally, the continued survival of archaeological features may be very good.

In contrast to the forms of older disturbance postulated above, it is worth noting that in recent centuries land use outside the main settlements appears to have been relatively low impact. With the exception of the development of places such as Pensarn, Belgrano, Towyn and Kinmael Bay, comparison of First Edition and current large scale OS maps indicates relatively little change.

### 11.2.5 *Designations*

There are ten sites protected by the *Ancient Monuments and Archaeological Areas Act 1979* within the LSA, see *Table 11.2* below.

**Table 11.2** *Sites within the LSA Protected by the Ancient Monuments and Archaeological Areas Act 1979*

WA no.	SMR no.	Name	SAM no.
26	23082	Bodelwddan WW 1 practice trenches	FI186 (DEN)
67	102000	Dinorben Hillfort	De012 (DEN)
108	102012	Fynnon Gegidog	De186 (CON)
190	105808	Rhuddlan	FI068 (DEN)/FI229 (DEN)
192	102034	Rhuddlan Bridge	FI108 (DEN)
193	102031	Rhuddlan Castle	FI004 (DEN)
225	13116	Rhuddlan Town Banks	FI068 (DEN)
362	102567	St Asaph Bridge	FI026 (DEN)
463	100487	The Mount	De031 (CON)
470	102028	Twt Hill Palace	FI015 (DEN)

There are three designated Parks and Gardens within the Study Area, at:

- Kinmel Park, consisting of a house prominently set in a landscape park;
- Bodelwyddan Castle, comprising a well preserved eighteenth and nineteenth century landscape park; and
- Bodrhyddan, comprising the intact survival of a fine Victorian formal garden.

Where appropriate, 'Significant Views' are recorded within each Historic Park and Garden. The outward Significant Views at Kinmel Park look northward from Kinmel Manor while a west-facing Significant View at Bodelwyddan

Castle does not extend beyond the castle itself. The Significant Views at Bodrhyddan both face east.

### **11.3**            ***BASELINE NOISE***

The assessment of the existing noise levels at the location of the proposed onshore substation have relied on the measurements performed at Happy Days Holiday Park.

The proposed location of the electricity substation is located within 1 - 2 km of this measurement position. The background noise levels are predominantly set by traffic noise along the A587 and A55. The A55 being the dominant noise source in the vicinity. The location of substation will result in marginally higher noise levels due to traffic noise effects. For our assessment, we have used the measured levels collected at Happy Days Holiday Park to determine the lowest background noise levels for assessment purposes.

The minimum measured background noise level at Happy Days Holiday Park was 24 dB  $L_{A90,10 \text{ min}}$ . Quiet daytime noise levels range from as low as 32 dB  $L_{A90,10 \text{ min}}$ . Details of measured noise levels are presented in *Annex I*.

### **11.4**            ***TRAFFIC AND TRANSPORT BASELINE***

The road network in the immediate vicinity of the onshore works is shown on *Figure 11.2*. The principal roads in the vicinity are the A548, A525 and A547.

The A548 runs eastwards towards Rhyl and Prestatyn from the A55 at Pensarn and thence south-eastwards towards Flint and Connah's Quay.

The A525 links Rhyl to the A55 north Wales coast road at St Asaph. The A547 links the A55 at Abergele to the A548 at Prestatyn.

### **11.5**            ***LANDSCAPE AND VISUAL AMENITY***

#### **11.5.1**        ***Introduction***

This section provides a description, characterisation and evaluation of the landscape and visual context of the study area.

#### **11.5.2**        ***Landscape Context***

The landscape context of the study area is illustrated by *Figure 11.3*. The assessment has been based on a study area spanning the length of the transmission line route and covering land up to 2 km from each route on either side, as shown on *Figure 11.3*. The landscape of the study area has been examined to identify:






- the landform, hydrology, land use, land cover and landscape elements that form the existing landscape (landscape description); and
- the landscape designations in the study area.

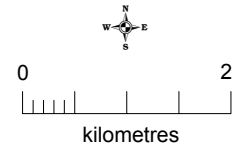
For each of the landscape character areas defined in the Clwyd Landscape Assessment (CCC, 1995), an analysis has been made of:

- some key characteristics - general description, location, topography, landscape and land use patterns, settlement and road patterns, the nature of views, and aesthetic and perceptual characteristics;
- landscape designations/protected areas;
- landscape quality; and
- visual receptors.

Figure 11.2  
Local Road Network

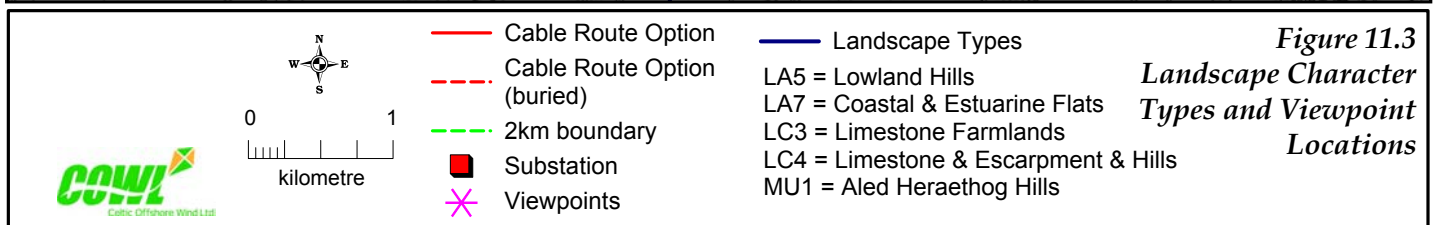
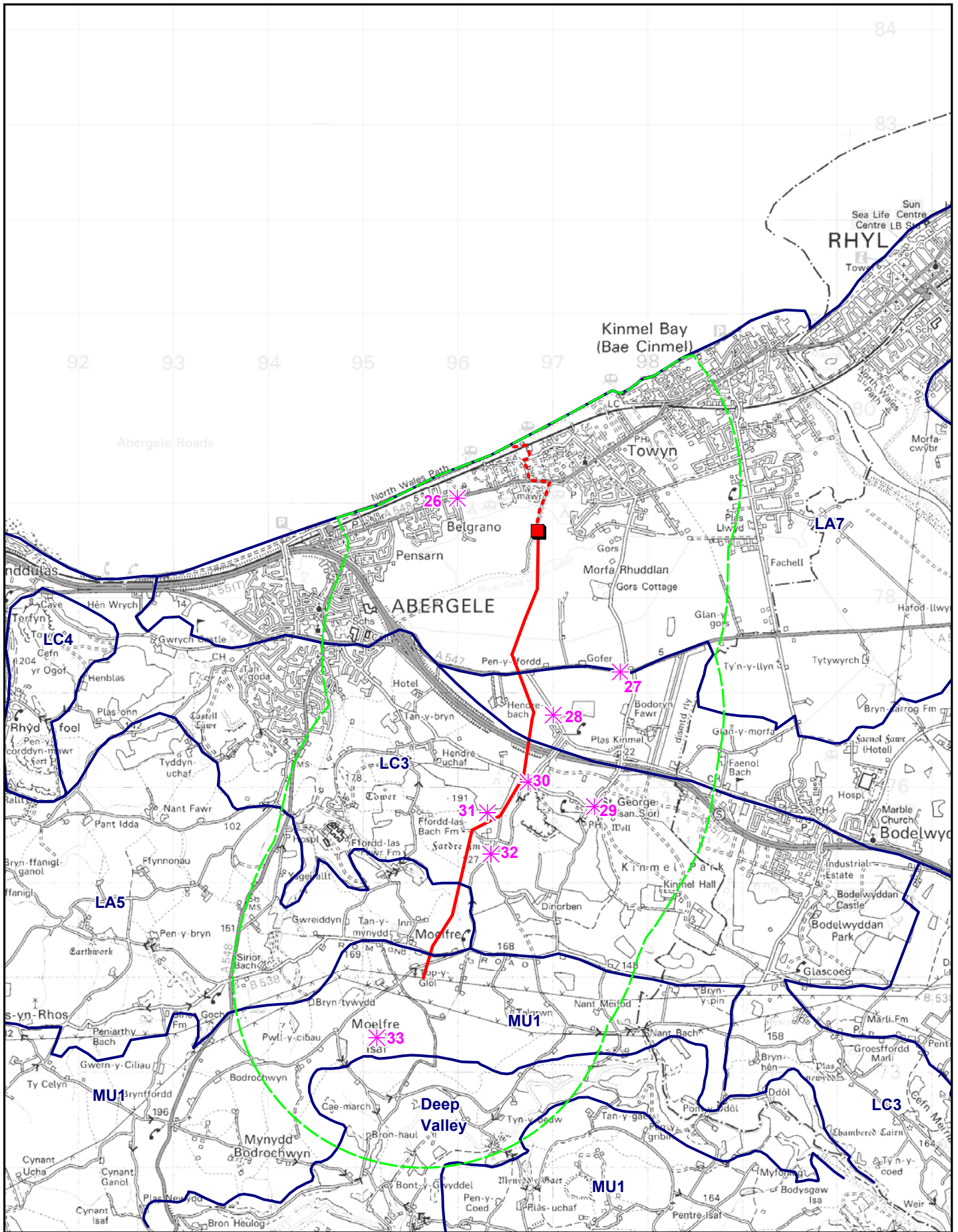


-  Offshore Cable Route
-  Onshore Cable Route
-  Onshore Cable Route (buried)
-  Substation Option
-  A Roads



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### *Landscape Description*

The existing landscape is the result of the underlying landform and hydrology, the overlying patterns of land use and land cover, and the arrangement of landscape features. These have arisen as the result of a combination of natural and manmade processes.

The study area consists of three main topographical areas: the flat coastal plains in the far north; the low-lying undulating hills within the middle of the study area overlooking the coast; and the more prominent high ridge hills within the far south of the study area.

The highest point in the study area is the summit of Moelfre Isaf at 317m AOD, with most land south of the village of St George undulating between heights of 150m and 180m AOD. The lower coastal plain lies at approximately 5m AOD with several settlements located adjacent to the sea, including Abergele, Belgrano, Towyn and Kinnel Bay.

The Afon Gele flows towards the coast across the flat coastal plains, with a network of water channels covering the agricultural land of the plains. The Afon Elwy and the Afon Clwyd flow out to the coast in the far northwest of the study area between Rhyl and Kinnel Bay.

Agriculture is the main land use over the majority of the study area. This has created a patchwork of irregular shaped fields, mainly with improved pasture, bounded by hedgerows and some fencing. There is also some grazing on the unimproved moorland areas on some of the higher land in the south of the study area. Woodland can also be found within the study area, mainly in large swathes of mixed woodland across the undulating hills overlooking the coast.

The main settlements in the area are within the northern region of the study area. Abergele, Pensarn, Belgrano, Morfa Rhuddlan, Towyn and Kinnel Bay are all situated in close proximity to each other, as well as to the coast. The small village of St George is located within the centre of the study area, with a generally sparse scattering of individual dwellings across the whole study area. Outside the coastal settlements, the flat coastal plain contains very few residential properties.

Vertical structures in the study area include industrial chimneys, church spires, pylons and overhead electricity grid cables. Two high voltage electricity lines with pylons cross the south of the study area just north of Moelfre Isaf.

The main roads in the study area are the A55(T), a dual carriageway route that runs through the area from Bodelwyddan in the east to Abergele and beyond in the northwest, the A548 in the far north of the study area, running along the coastline from Kinnel Bay and linking into the A55 at Abergele, and the A547 which runs across the coastal plains and through the centre of Abergele.

There is only one B road in the study area; the B5381 travels through the far south of the study area, below Moelfre Isaf. A network of minor and unclassified roads cross the study area and, for the purposes of this assessment, have been classed as local routes. A passenger rail route runs along the coastline, with stations at Rhyl and Abergele.

Due to the relative high density of the settlement along the coast, much of the recreation in the area is focussed on the coastal region. There are several caravan parks and holiday centres located in this area offering seasonal recreation, with the North Wales Coast Path and cycle routes running adjacent to the coastline. A leisure centre and a racecourse are located between Towyn and Kinnel Bay town centres. Abergele also has a leisure centre. Recreation within the remainder of the study area is mainly focussed on the many footpaths and bridleways found across the undulating hills and higher land.

#### 11.5.4 *Landscape Designations*

The landscape designations in the study area are shown on *Figure 11.3*. The study area is outside of any national landscape designations. However, three local landscape designations cover parts of the study area:

- The Special Landscape Area designation (SLA) is a local designation covering large swathes of the CCBC District. Within the study area itself, the SLA covers most of the landscape south of the A55 (T), including St George, Tower Hill, Kinnel Manor, Moelfre and Moelfre Isaf.
- The Green Barriers designation is a local landscape designation covering smaller, more isolated areas of land, usually adjacent to settlement areas. Within the study area, the Green Barriers designation is located immediately to the south of the settlements of Pensarn, Belgrano, Morfa Rhuddlan and Towyn.
- The Coastal Zone designation covers the coast and beaches adjacent to the settlements of Abergele, Pensarn, Belgrano, Towyn and Kinnel Bay.

There are also Conservation Areas in the centre of Abergele and in St George.

Existing SLA, Green Barrier and Coastal Zone designations have been considered within this assessment, as amendments to designations in the draft Conwy UDP are not expected to be adopted until 2004. It should be noted that the current SLA and Green Barrier designations cover much of the land where the revised local landscape designations are to be located (as set out in the draft Conwy UDP).

#### 11.5.5 *Landscape Character and Quality*

The study area has been described and characterised as part of the Clwyd Landscape Assessment (CCC, 1995). Within this assessment, the study area

landscape is characterised by six landscape types, described in *Table 11.7* and illustrated in *Figure 11.3*. These are:

- coastal and estuarine flats;
- vale farmlands;
- limestone farmlands;
- lowland hills;
- Aled Hiraethog Hills; and
- deep valleys.

The following descriptions are based on those in the Clwyd Landscape Assessment, supplemented by fieldwork observations made for this assessment.

#### *Coastal and Estuarine Flats*

This landscape type consists of an open and flat landscape, largely devoid of trees and often with a degraded appearance. This landscape type is located adjacent to the coast with a fringe of sand dunes and saltmarsh. The low lying landscape is used mainly for agriculture, having been reclaimed from former marshland, and is set out in mainly geometric pasture and arable fields. Fields are mainly bounded by hedgerows, which are often broken, and reinforced by fencing. There are few hedgerow trees, with occasional small swathes of deciduous or coniferous woodland belts. Coastal resort towns are linked by extensive caravan sites creating continuous urban development along the coast.

#### *Vale Farmlands*

This landscape type consists of a predominantly pastoral farmland with generally medium to large scale irregular field patterns. The land slopes gently towards the coast and contains few woodlands but the dominant hedgerow tree cover creates a superficially wooded character. Estate wooded character is a strong influence in parts, with estate halls and farms of local stone and red brick giving a strong historic character and interest.

#### *Limestone Farmlands*

This landscape type has a gently undulating landscape with a strong local limestone character, often with rocky outcrops. The area is well wooded, with ash as a dominant species, and strong estate woodland character in places. The remains of past mining and quarrying activities are evident, as well as isolated areas of current quarrying. Overall, there is an essentially rural character, with small villages, scattered farms and cottages, often built of local limestone. Fields are small to medium-sized with thorn hedges and dry stone walls.



### *Lowland Hills*

This landscape type consists of low rolling hills divided by shallow, often dry valleys. Mixed and thorn hedgerows divide medium to large sized irregular and semi-irregular fields. Hedgerow trees, particularly oak, are very common, in addition to small deciduous copses. This landscape type contains a large network of major and minor roads, as well as many farms, small holdings and cottages.

### *Aled Hiraethog Hills*

This landscape type consists of a remote and intimate landscape of high hills and valleys with a strong rural character. Much of the land has been agriculturally improved, with occasional areas of unimproved land on the open, rounded hilltops where areas of heath and bracken survive. Fast flowing rivers and streams flow through the valleys, where broadleaf woodlands are also common. A network of minor and winding roads link stone built small villages and scattered farmsteads. The ancient irregular field pattern of small to medium sized fields is defined by often overgrown thorn hedges.

### *Deep Valleys*

This landscape type consists of narrow and deep valleys which are well wooded and carry major watercourses. The valleys are very steep sided, in direct contrast to the surrounding landscapes, with slopes a mixture of woodland, rough pasture, scrub and bracken, and used for un-intensive farming. Past quarrying activities are also evident, with some valleys carrying major communication routes, as well as small villages and farms.

**Table 11.3** *Landscape Types*

<b>Landscape type</b>	<b>Designations</b>	<b>Quality</b>	<b>Visual receptors</b>	<b>Views</b>
Coastal and estuarine flats	Green Barrier and Coastal Zone	Low	Residents, tourists, main and local road users, walkers and users of the North Wales Coast Path (NWC Path).	Partially contained by the coastal settlements, also by surrounding higher land. Mainly short to medium distance.
Vale farmlands	None	Medium	Residents, main and local road users.	Generally short to medium distance, enclosed by surrounding higher land and vegetation.
Limestone farmlands	SLA	Medium.	Residents, main and local and B class road users, walkers.	Medium distance across the landscape type, some longer distance out to sea from edge of area.

Landscape type	Designations	Quality	Visual receptors	Views
Lowland hills	SLA	High	Residents, local and B class road users, walkers and horse riders.	Short to medium distance.
Aled Hiraethog Hills	SLA	High/medium	Residents, local and B class road users, walkers and horse riders.	Short to long distance.
Deep valleys	SLA	High	Residents, local and B class road users, walkers, horse riders.	Short to medium distance.

Note: Sections of the SLA, Green Barrier and Coastal Zone fall within parts of these landscape types. However, not all regions of these landscape types are within these local designations.

### 11.5.6 Visual Receptors

A total of twenty-five viewpoints were visited during the fieldwork. Of these, eight were selected and considered representative of the main views and receptors in the study area related to the transmission line route. These viewpoints are listed in *Table 11.4* and their locations shown on *Figure 11.3*. The existing and predicted views from these viewpoints are shown on Viewpoints 26 - 33 in *Volume IV*. Photographs illustrate the existing views from each viewpoint (26-8). Photomontages and computer generated wireframes illustrate the predicted views.

Details of the viewpoint analysis are presented in *Annex L, Volume V*.

**Table 11.4** *Transmission Line Route Viewpoints - Visual Receptors and Landscape Types*

No	Viewpoint	NGR	Elevation (mAOD)	Distance from development	Direction of view towards route	Receptors	Landscape type
26	A548 near Belgrano	295995 379064	4	0.9km	SE	Main road users, residents	Coastal and estuarine flats
27	A547 Rhuddlan Road near Bodoryn Cottages	297714 377231	6	1.0km	W	Main road users	Vale farmlands
28	St Asaph Road near Bodtegwel Terrace	297006 376777	18	0.2km	W	Local road users, residents	Vale farmlands
29	St George	297441 375812	60	0.8km	W	Local road users, residents	Limestone farmlands

No	Viewpoint	NGR	Elevation (mAOD)	Distance from development	Direction of view towards route	Receptors	Landscape type
30	Junction of Nant Ddu Road and St George's Road	296741 376070	63	0.07km	W	Local road users	Limestone farmlands
31	Footpath above Fadre Farm	296312 375747	155	0.1km	E	Footpath users	Limestone farmlands
32	Local Road near Fadre Farm	296349 375311	122	0.25km	W	Local road users, residents	Limestone farmlands
33	Summit of Moelfre Isaf	295146 373374	317	0.8km	NE	Walkers	Aled Hiraethog Hills