BARRY ENERGY RECOVERY LTD

BARRY ENERGY RECOVERY FACILITY – NON-TECHNICAL SUMMARY

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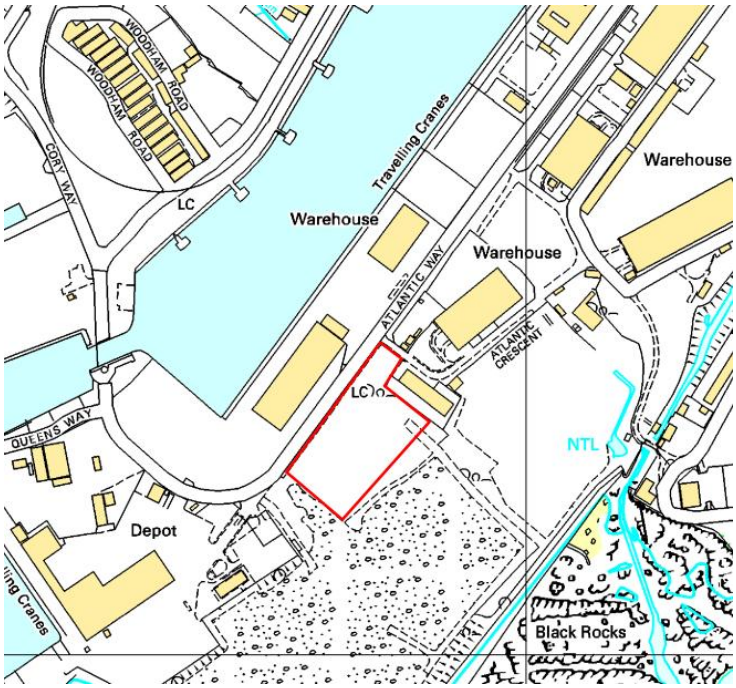
1 INTRODUCTION

The Proposals

Barry Energy Recovery Ltd (BERL) propose to build and operate a 7.5 electrical (MW_e) Energy Recovery Facility at Barry Docks, Vale of Glamorgan (See Figure 1).

The Facility will process approximately 80,000 tonnes of residual waste per annum to create 7.5MW_e of renewable electricity for transfer to the National Grid system. This Non-Technical Summary (NTS) summarises the findings of the Environmental Statement (ES) prepared to address the environmental issues associated with the scheme.

Figure 1 - Site Boundary



The Site, (NGR: 312810, 167260) extends to approximately 1.6 ha and is located in an existing industrial environment. Historic and existing land use in the vicinity of the Site includes other waste management activities and bulk materials storage and handling (including stockpiles of sand and other aggregates). At present, the site is covered by scrub vegetation, all of which will be removed as a consequence of the proposed Development.

The technology proposed comprises two stages to process the waste. In Stage 1, waste is heated in a reduced oxygen environment which converts the material into a synthetic gas (the syn gas); this is the gasification part of the process. The syn gas is then transferred to a second stage (oxidation) where it is burnt as a more efficient fuel. This combustion process in turn creates heat and steam which drives a turbine creating renewable electricity. The whole process is controlled and monitored throughout, including monitoring of fuel feed-rates, temperatures, process efficiencies, pollutant emission levels and renewable energy production.

The Facility will process waste materials and generate renewable energy on a 24 hour basis however, particular activities, including receipt of waste, will be restricted to normal operating hours described in Section 2.

The proposed Energy Recovery Facility falls under Schedule 1 Part 10 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended) (hereafter referred to as the EIA Regulations) therefore an Environmental Impact Assessment is required.

Policy Context

At a National level a range of planning policy guidance notes have been identified that are of relevance to the proposed Development. Consideration has been taken of them in both the ES and the Planning Application.

Technical Advice Notes (TANs) from the Welsh Regional Assembly provide advice on good practice and other relevant information. A range of TANs has been considered in relation to the proposed Energy Recovery Facility.

The current local development plan for the proposed site is the Vale of Glamorgan Unitary Development Plan (UDP) 1996-2011, adopted 18 April 2005. The UDP provides the strategic and detailed policy framework for Barry. Consideration has also been given to the Vale of Glamorgan Local Biodiversity Action Plan (LBAP), adopted May 2002.

2 PROPOSED DEVELOPMENT

Need for the Development

The proposed Facility is aimed at contributing to sustainable waste management. All sections of society produce waste and have been doing so in ever increasing quantities over recent years. Traditionally most of this waste has been managed by disposing of it to landfill. However the way in which we manage our waste is currently undergoing substantial change.

It is no longer acceptable to simply throw waste away, it must be first treated to remove wastes that can be reused and recycled, to remove wastes from which value can be recovered, and to process wastes in a way that leaves the residues more stable, thus reducing their potential effect on the environment. Most notably the waste hierarchy has been introduced which together with targets set by the EU Landfill Directive (1999/31/EC) has presented the UK with significant challenges relating to the need to divert biodegradable waste from Landfill. The UK government has also introduced the Landfill Tax Regulations 1996 which provide fiscal drivers for commerce and industry and LA'S to find alternative methods for treating and disposing of controlled waste – currently the standard rate of landfill tax is £32 per tonne which applies to non inert waste, but this will increase by £8 per tonne per year (April each year) until 2010/11.

There is a demonstrable need for sustainable CIW/C&D disposal capacity within the Sub Region (Vale of Glamorgan, West Cardiff, Rhondda Cynon Taff, and Bridgend) and by 2010 the proposed Facility would provide 13% of the required CIW and C&D disposal capacity required. Currently a significant proportion of the waste arising in the four local authority areas is transported and disposed of outside the area. This situation is unsustainable and conflicts with the driving principles set out within Wise about Waste, particularly the need to be self sufficient in waste treatment in Wales and to treat and dispose of waste as close to its origin as possible.

The proposal to construct and operate an Energy Recovery Facility in VoG will provide businesses in Vale of Glamorgan, Bridgend, West Cardiff and Rhondda Cynon Taff with a sustainable, reliable and cost effective waste disposal solution for a range of wastes which will contribute to the economic growth of the Sub Region.

Over the past 25 years in the UK there has been a steady increase in consumption of energy with the UK consuming approximately 20% more energy in 2006 than it did in 1982. In addition the cost of energy is rising across all energy types. Consequently, there is a real demand in the UK to implement effective renewable energy solutions. The proposed Facility provides one such solution which draws together the need to provide alternative waste management technologies and generate renewable electricity for public supply.

Site Description

The site is accessed from Fforydd Y Mileniwm, Wimbourne Road and Atlantic Way. Wimbourne Road and Atlantic Way are in private ownership although limited public access is permitted across Wimbourne Road. The site is situated on a level plot, approximately 1.6 ha in size, at National Grid Reference 312810,167260 off Atlantic Way, within Barry Docks. The site is currently disused with no buildings on site. The site is vegetated with a mixture of grasses, scrub, ruderal and immature trees. There is evidence on-site of fly tipping. The site is considered to be of low ecological value.

Surrounding land use comprises mixed industrial activities, including waste management activities (scrap yards, waste segregation, and landfill) and bulk materials storage and handling (including stockpiles of sand and other aggregates) and other small industrial units.

The existing nearby industrial buildings range in size from single storey industrial units through to large warehouses, some of which exceed 10m high. Tall structures near to the site are limited to lighting towers for other sites, although approximately 1.1km north east of the site is a chemical works facility with a number of tall structures estimated to be approximately 70m high. The Rank Hovis building forms a significant structure to the north west of the site.

General Process Description

Waste will be transported via the local road network to the site. It is estimated that at full capacity the site will be serviced by approximately 27 vehicle deliveries per day. Waste will only be accepted on site during the following hours:

- 7am and 7pm Monday to Friday
- 7am and 5pm on Saturdays

Delivery Vehicles will enter the Waste Reception Hall (WRH) and will tip waste into the Waste Silo. The WRH is operated slightly below atmospheric pressure to reduce the risk of odour release. Waste from the Waste Silo is then transferred by crane to the recycling area where ferrous materials are removed. The waste is then shredded to promote a uniform sized material. Once the material has been processed this fuel material is discharged into a fuel silo. The fuel is transferred to a fuel feed hopper via an overhead crane grab. Processing of the fuel is carried out in the energy recovery unit. The fuel is heated in the gasifier to produce a syn gas. The solid material remaining is called bottom ash. The syn gas is transferred to the second stage of the process where the syn gas (along with additional air) is burnt at high temperatures – this stage is called oxidation. Once the synthetic gas is oxidised it is converted to a hot flue gas which is transferred to a boiler to produce steam. The steam in turn passes through a steam turbine to generate renewable electricity. The Flue gas created following oxidation is mixed with lime and carbon to produce a light weight ash which is removed from the flue gas by filters before the flue gas is discharged to the atmosphere via an emissions stack. The filtered fly ash is collected from the filters and stored in a sealed dust silo.

As well as the renewable electricity the process will generate quantities of steam that may prove useful to local users for heating their premises so the Applicant is discussing the opportunities to use the steam with local landowners including Dow Corning Chemicals and the developer for the South and East Quays developments.

The Bottom Ash produced following stage 1 is inert and will be recycled for block making or for use as a secondary aggregate and the Applicant is also exploring opportunities to reuse the fly ash as an aggregate.

The development will comprise 4 buildings with a maximum height of 23.6m and an emissions stack, 45m in height. The Facility, with the exception of the waste and fuel storage bunkers, will be raised above ground. The waste and fuel bunkers will be excavated to a depth of 8 m to allow vehicles to reverse up to the waste bunkers without the need for access ramps.

The site will incorporate 18 car parking spaces, 7 will be adjacent to the front entrance of the site and 11 abutt the workshop and office building with two being disabled spaces. 5 bicycle parking spaces will also be provided close to the office and workshop

Construction is anticipated to take 18 months with the development having a lifespan of 25 years, although this may be extended with appropriate maintenance.

Figure 3 – Impression of proposed facility

3 ENVIRONMENTAL IMPACTS

Introduction

The construction and operation of the proposed Facility is likely to cause some changes in the local environment. These changes are associated with changes in noise levels, habitat impacts and visual impacts. They may also be caused by operational activities such as changes in traffic patterns, changes in landscape and ecology.

The proposed Facility includes mitigation measures which will help to reduce, eliminate or compensate for the negative effects that may arise as a consequence of the proposals. The mitigation measures for each of the environmental topics are described in the ES. The following sections summarise the findings of the Environmental Impact Assessment and the recommended mitigation measures proposed in the Environmental Statement

Air Quality

An air quality assessment has been undertaken which considered the potential impacts of the construction and operation of the proposed Facility. The emissions of pollutants have been assessed by estimating the impact of emissions on relevant receptors and resources.

During construction, the development is not expected to result in a large number of vehicle movements and the use of best practice construction techniques will minimise dust generation. Impacts to air quality and dust soiling at the nearest residential receptor are predicted to be low. No impacts are likely to occur at nearby ecological receptors. Construction impacts associated with the scheme are therefore predicted to be Negligible.

During operation with a stack height of 45m, predicted concentrations of all pollutants are less than 5% of the relevant objectives and Environmental Assessment Levels (EALs). Since background concentrations in the area are well below the objectives and EALs, this is deemed to be a Negligible Impact.

For dioxin emissions, a risk assessment methodology was used. The worst case Total Daily Intake of dioxins was found to be consistent with the WHO recommended intake.

At Barry Island, the nearest ecological receptor the facilities contribution to NOx concentrations has been determined to be a Negligible impact.

Operational impacts on air quality at residential receptors are therefore Negligible.

Ecology

The ecology and nature conservation features of interest at the development site and in the area have been determined through a combination of desk study and site appraisal. The site was found to be of very limited conservation value and biodiversity interest.

The proposed development is assessed as having no significant impact on the ecological features. Some mitigation measures have been identified in line with legislative requirements and enhancement measures are proposed to provide opportunities for net ecological gain. A landscaping plan has been produced which incorporates some native planting and a wetland area. This will increase the biodiversity of the area and provide a degree of visual screening. The landscaping plan is provided at the back of this NTS.

Ground Conditions

A review of desk-based environmental information associated with the Site and the surrounding area and a site investigation has been undertaken. These indicate that there were a number of historical site uses, including railway sidings and landfill activity, which may have left behind a range of contaminants, some of which are potentially harmful to human health and / or the environment. Boreholes excavated material typical of demolition waste, such as ash, clinker, brick and concrete. It is recommended that materials resulting from excavations will need to be disposed of off site. Most of the soil samples were within screening criteria for the contaminants tested with the exception of one concentration of copper and one of asbestos. In a few cases the groundwater samples just exceeded the screening criteria for some contaminants. Gas monitoring was undertaken during the investigations and is continuing in order to better understand the ground conditions,

A range of mitigation measures have been identified for the Facility which will be implemented during the design and construction phases of the project. Based on the available information the Facility is considered to have a moderate negative impact during the construction phase and a slight positive impact during the operational phase.

In order to refine the likely impacts associated with the proposed development further site investigations and assessments will be undertaken as the project progresses. The findings of these will influence the design of the Facility and construction working methods. Due consideration will be given to the presence of ecologically important vegetation but there isn't any and Japanese knotweed within the Site.

Landscape

A landscape and visual impact assessment has been undertaken for the proposed Energy Recovery Facility in accordance with the methodology and assessment criteria contained in the Guidelines for Landscape and Visual Impact Assessment.

There would be a slight adverse change to the landscape character of the Atlantic Trading Estate Area of Special Identity due to the scale of the proposed building and stack which cannot be fully mitigated. However, other aspects of the development can be mitigated and the proposals would result in a well designed, high quality building in a soft landscaped setting on an existing vacant brownfield site. The landscape plan is provided at the back of this NTS.

Temporary moderate adverse visual impact from a close distance was identified from one industrial location (low sensitivity) during the construction phase. The temporary and permanent impacts on all other views were assessed as either slight adverse or experiencing no change. The most significant change would be to south facing views where the proposed building and stack would be a prominent feature in relation to adjacent low rise industrial buildings set against the low horizon of the Bristol Channel and distant English coastline.

The design (with mitigation) of the proposed development would comply with the objectives of policies contained in the Vale of Glamorgan Unitary Development Plan 1996-2011 (adopted 2005) and supplementary planning guidance that seek to control development and minimise adverse environmental effects. The development would make a positive contribution to the regeneration of Atlantic Way and the Atlantic Trading Estate as a whole.

Noise

A baseline noise survey has been undertaken and an assessment has been made of likely construction noise and vibration using assumed worst case noise levels for the likely construction methods. The impact of construction noise and vibration is considered to be of minor significance at noise sensitive receptors (NSR) in the vicinity of the site. The impact of predicted operational noise from the proposed Facility has been assessed against background noise levels obtained during the baseline noise survey. The assessment found that noise levels at all NSR locations will be of less than marginal significance, and that complaints from existing residents are unlikely. The impact of increased traffic noise associated with the operation of the facility has been assessed and the predicted increases in traffic noise are not considered to be significant.

Overall the noise and vibration impact of the proposed Faciltiy is considered to be of less than marginal significance. Through careful design there are not considered to be any residual noise impacts associated with the proposed Facility.

Traffic

A traffic impact assessment has been conducted for the proposed Facility. This has considered the impact of increased traffic, and specifically HGVs on two roads in the vicinity of the proposed site, these being Wimbourne Road (a private road with limited public access) and FFordd y Mileniwm. The assessment assumes that waste will be delivered to the site by 21 tonne HGVs. In addition the assessment has considered the availability of public transport and opportunities for cycling.

The assessment indicates that operation of the Facility will result in a less than 10% increase in HGVs on the local highway network. Current guidance indicates that this is no greater than daily variation in traffic flows. The nearest public transport link to the site is Barry Docks railway station, 600m away. Current guidance indicates this distance is too great for people to make the walk from the station to the Facility. Whilst there is a footpath along Atlantic Way again distances from residential development are too great for people to travel to the Facility on foot. National Cycle Route 88 runs along FFordd y Mileniwm providing good cycle access to the site. To encourage workers to cycle to

work, bike racks and showers have been incorporated into the design. No mitigation measures are proposed for either the construction or operational phases of the project.

Water Resources

An assessment of potential impacts upon the water environment was undertaken. The potential water environment receptors include surrounding surface water features, underlying groundwater or aquifers, and flood sensitive areas. All permanent surface water features are located at least 100m from the site. The proposed Facility will be constructed in such a way as to minimise flood risk to the building and will incorporate appropriately designed drainage so as to minimise flood risk to other sites in the vicinity. The EA's recommendations regarding the use of oil interceptors will be incorporated at the detailed design stage.

With incorporation of appropriate mitigation measures and the use of construction best practice, impacts on water resources during construction are considered to be slight adverse, impacts during operation are considered to be not significant. Overall the impacts of the proposed Facility on water resources are considered to be not significant.

Cumulative Effects

In consultation with the local planning authority two proposed developments were identified in the vicinity of the application site which had the potential to generate cumulative impacts. Both sites lie within or adjacent to areas of existing development. The first development considered was for residential properties with some associated commercial development. A planning application had not been submitted for this development at the date of this assessment and therefore environmental information relating to the proposals was not available. The second development considered was for a Wood Burning Gasification Facility. A Planning Application has been submitted for this site and was viewed prior to undertaking the cumulative impact assessment. The Planning Application contained limited environmental information. Professional judgement has been used as to the likely environmental effects associated with both of the developments identified.

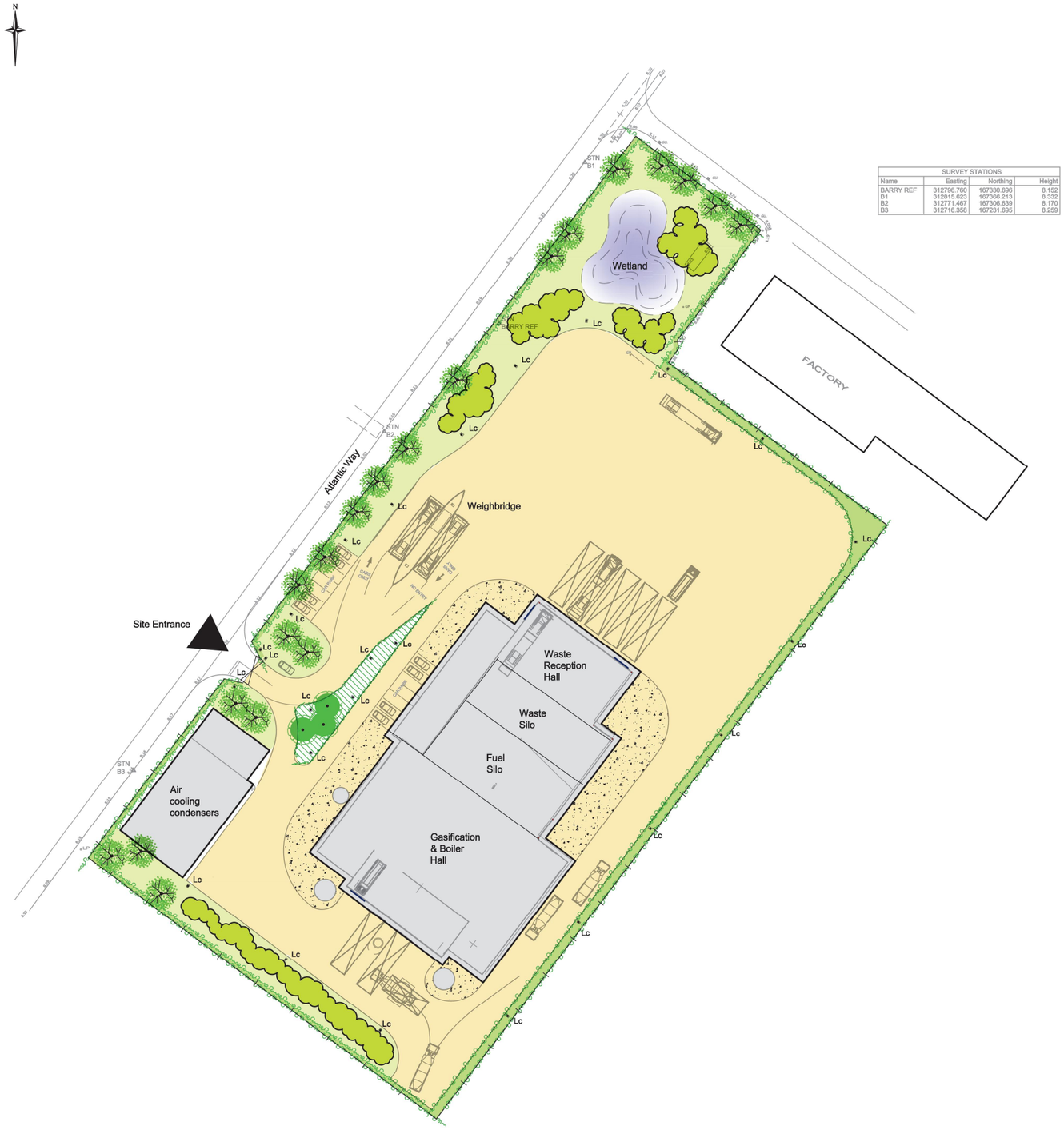
Due to a paucity of construction information for either proposed development, construction impacts could not be considered for cumulative assessment. Cumulative impacts were considered for environmental topics, which were likely to result in a negative impact (Air Quality - impacts upon ecological receptors and landscape - impacts upon landscape/townscape and effect on views). Cumulative assessment of the proposed Facility and the two developments considered indicates that although cumulative impacts will occur these will be minimal in the case of impacts to air quality and potential exists for a reduction in landscape impacts.

4 CONCLUSION

The Environmental Statement concludes that the proposed Development would have no significant impact upon most environmental aspects and that some would experience a slight positive effect through the mitigation measures incorporated into the scheme (when short and long-term effects and positive and negative effects are taken into account). The design of the Facility has taken account of changes recommended in order to reduce the environmental impacts, for example the stack height has been increased to bring emissions in line with recommended levels and a landscape plan has been produced which utilises native species and incorporates a wetland feature which will provide both water storage capacity and increased opportunities for wildlife. The proposed landscaping will also provide a degree of visual screening.

The Facility will provide renewable electricity for transfer to the National Grid and will reduce waste going to landfill from the region, thus providing a benefit to the surrounding area. The Facility will also generate employment, particularly during its construction.

On balance it is concluded that the proposed Scheme would provide a net environmental benefit.



SURVEY STATIONS			
Name	Easting	Northing	Height
BARRY REF	312796.760	167330.696	8.152
D1	312815.023	167366.213	8.332
B2	312771.467	167306.639	8.170
B3	312716.358	167231.695	8.259

NOTES

1. The functions of the proposed planting are:

- For visual amenity and landscape integration
- To screen operational areas within the development site
- To provide a significant extent of new tree and shrub planting that would eventually provide connectivity with nearby existing woodland and hedgerows in accordance with the landscape guidelines for the Atlantic Trading Estate

2. All plant material, lifting, packaging, handling and workmanship would be in accordance with BS 3936, BS 4043, BS 4428 and the National Plant Specification (Horticultural trades Association).

3. All planting would be undertaken using local provenance stock where available.

4. The proposed planting would comprise predominantly native species of trees and shrubs of the following species, sizes and arrangement:

OUTLINE PLANTING PROPOSALS

Species	Size at planting	Density	Notes
Planting objective:	**Visual amenity with immediate impact**		
Fraxinus oxycarpa Raywood *(Ash species)*	Extra Heavy Standard, 4.0 -4.5 metres high	As shown	
Tilia Greenspire *(Lime species)*	Extra Heavy Standard, 4.0 -4.5 metres high	As shown	
Betula pendula *(Silver Birch)*	Multi-stemmed tree, 3-5 stems, 2.5 – 3.0 metres high	As shown	Specimen tree planting at site entrance
Planting objective:	**Boundary (hedge) planting for screening, visual amenity, landscape integration and biodiversity**		
Acer campestre *(Field Maple)*	60-80cm, bare root	6 plants per linear metre, plant in double staggered row 30cm between plants, 25cm between rows, plant in groups of 3 -11 of each species, species groups intimately mixed.	15% of species mix
Corylus avellana *(Hazel)*	60-80cm, bare root		15% of species mix
Crataegus monogyna *(Hawthorn)*	60-80cm, bare root		40% of species mix
Ilex aquifolium *(Holly)*	30-40cm, 2 litre pot		10% of species mix
Prunus spinosa *(Blackthorn)*	60-80cm, bare root		10% of species mix
Quercus robur *(Oak)*	60-80cm, bare root		10% of species mix
Planting objective:	**Tree and shrub planting for screening, visual amenity, landscape integration and biodiversity**		
Acer campestre *(Field Maple)*	60-80cm, bare root	250cm apart	10% of species mix, plant in groups of 1-3m
Corylus avellana *(Hazel)*	60-80cm, bare root	100cm apart	20% of species mix, plant in groups of 7-11
Crataegus monogyna *(Hawthorn)*	60-80cm, bare root	100cm apart	30% of species mix, plant in groups of 7-15
Ilex aquifolium *(Holly)*	30-40cm, 2 litre pot	100cm apart	10% of species mix, plant in groups of 3-5
Prunus spinosa *(Blackthorn)*	60-80cm, bare root	100cm apart	20% of species mix, plant in groups of 7-11
Quercus robur *(Oak)*	60-80cm, bare root	100cm apart	10% of species mix, plant in groups of 1-3m
Planting objective:	**Low groundcover planting for visual amenity**		
Hedera Hibernica *(Ivy species)*	20-30cm, 2 litre pot	500cm apart	
Iris foetidissima *(Iris – native species)*	2 litre pot	Groups 400cm apart	Plant in groups of 7 – 21 randomly spaced amongst Hedera
Planting objective:	**Marginal planting to wetland for visual amenity and biodiversity**		
Carex pendula *(Sedge species)*	Plugs	20cm apart	Plant in groups of 5 – 21 adjacent to permanent water area
Iris pseudoacorus *(Flag Iris – native species)*	1 litre pot	30cm apart	Plant in groups of 11 – 33 adjacent to permanent water area
Planting objective:	**Grass for visual amenity in general areas and for biodiversity in the wetland**		
General grass areas would be sown with a proprietary landscape seed mix, British Seed Houses A19 Landscape mix or similar species composition			
Wetland areas would be sown with proprietary wetland seed mix – composition to be determined following soil analysis			

5. Planting would be undertaken in the first planting season following completion of the construction works.

6. All planting areas would receive a minimum depth of 40cm topsoil and amenity grass seeding areas 15cm. Wetland grass seeding areas would receive 15cm subsoil or low nutrient topsoil cover.

7. All tree and shrub planting would be protected from rabbit damage with individual guards secured at the time of planting.

8. All planting would be maintained for a minimum period of 5 years to ensure full and successful establishment. Maintenance visits would be routinely undertaken at sufficiently frequent intervals to ensure all plants are firmed up, all weed growth removed, all dead, damaged or diseased wood removed, and plant guards, stakes and ties secured. Watering would be undertaken in the first and second year following planting to promote successful growth. All plants that fail to thrive would be replaced in the following planting season.

Key

Proposed

- Building / Structure
- Security fencing, 2.4m high
- Gate
- Paving:
- In-situ concrete
- Gravel
- *Lc Lighting column
- Planting:
- Trees (Extra Heavy Standards)
- Specimen tree (Multi-stemmed)
- Hedge
- Tree / shrub
- Low groundcover
- Grass
- Wetland (water levels fluctuate)