

Appendix 6: 2010 ES Documents

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Environmental Statement

Prepared on behalf of Sunrise Renewables Ltd
for
Erection of new industrial building and installation
of 9MW wood fuelled renewable energy plant
on
Land off Woodham Road, Barry Docks

December 2009

sa/ms/4116

2008/01203/FUL
VOLUNTARY ENVIRONMENTAL
STATEMENT (SUBMITTED
AT APPEAL STAGE).

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GLOSSARY

Baseline Conditions	Information on the site's current status against which to measure any effects
Biomass	The collective term for renewable biological material derived from plant and animal sources, which is used to generate heat, electricity or motive power
Combined Heat and Power	Simultaneous generation of usable heat and power (usually electricity) in a single process
Cumulative Effects	A number of developments in a locality or a continuous activity over time that together may have an increased impact on the environment, local community or economy.
Dispersion modelling	The mathematical simulation of how air pollutants disperse in the ambient atmosphere.
Ecology	Study of interactions between organisms and the interactions of these organisms and their environment
Environmental Impact Assessment	A procedure that must be followed for certain types of project before they can be given 'development consent'. The procedure is a means of drawing together, in a systematic way, an assessment of a project's likely significant environmental effects.
Environmental Statement	Aims to provide environmental information to the public and other interested parties regarding the environmental impact of the proposed development
Geology	The study of the solid and liquid matter that constitutes the Earth. The field of geology encompasses the study of the composition, structure, physical properties, dynamics, and history of Earth materials, and the processes by which they are formed, moved, and changed.
Hydrogeology	The area of geology that deals with the distribution and movement of groundwater in the soil and rocks of the Earth's crust.
Hydrology	The study of the movement, distribution, and quality of water throughout Earth
Mitigation measures	Steps that could be taken to minimise or eliminate the adverse impacts of a development
Non-technical Summary	A summary of the project and its likely effects in non-technical language
Pathways	The route by which a receptor is being or could be exposed to, or affected by a contaminant

Planning Inspectorate	The Planning Inspectorate's main work involves the processing of planning and enforcement appeals and holding examinations into regional spatial strategies and local development plans.
Proximity principle	Advocates that waste should be disposed of (or otherwise managed) close to the point at which it is generated, thus aiming to achieve responsible self-sufficiency at a regional/or sub regional level.
Receptors	It is either: a) a living organism, a group of living organisms, an ecological system or a piece of property that is listed in the Statutory guidance for significant harm and is being or could be harmed by contaminant or b) controlled waters which are being, or could be, polluted by a contaminant
Renewable Energy	Energy generated from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished)
Screening Direction	The determination by the planning authority and the Welsh Ministers of whether EIA is required is known, respectively, as a screening opinion and screening direction.
Site of Special Scientific Importance	A conservation designation denoting a protected area in the United Kingdom.
Sources	A contaminant is substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters
Unitary Development Plan	An old-style development plan prepared by a metropolitan district and some unitary local authorities, which contains policies equivalent to those in both a structure plan and local plan. These plans will continue to operate for a time after the commencement of the new development plan system, by virtue of specific transitional provisions.

ABBREVIATIONS

ABP	Associated British Ports
ACM	Asbestos-containing Materials
AOD	Above Ordnance Datum
AONB	Area of Natural Beauty
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
CHP	Combined Heat and Power
CCW	Countryside Council for Wales
DAFOR	D = Dominant, A = Abundant, F = Frequent, O = Occasional, Rare = Rare
DEFRA	Department for Environment, Food and Rural Affairs
DEM	Digital Elevation Model
EC	European Commission
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
GIS	Geographical Information System
HCV	Heavy Commercial Vehicle
HGV	Heavy Goods Vehicle
IUCN	International Union for Conservation of Nature
LPA	Local Planning Authority
MIPPS	Ministerial Interim Planning Policy Statement
NAQS	National Air Quality Strategy
PRA	Preliminary Risk Assessment
SEWRWP	South East Wales Regional Waste Plan
SLA	Special Landscape Area
SSSI	Site of Special Scientific Interest

TAN	Technical Advice Note
UDP	Unitary Development Plan
UK	United Kingdom
VGC	Vale of Glamorgan Council
WAG	Welsh Assembly Government
WID	Waste Incineration Directive
WRAP	Waste and Resources Action Programme
ZVI	Zone of Visual Influence

PREFACE

A copy of this Environmental Statement are available for viewing at the Planning and Transportation Department, Dock Office, Barry Docks, Barry CF63 4RT

The documentation comprises a Non-technical Summary and the full Environmental Statement. Copies of the documentation are also available for purchase. Both are available in paper or digital form from:

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Email Brenda.s@sedgwickassociates.co.uk.

The Non-technical Summary is available free by email or £8.00 for a bound paper copy by post. The price of the optical disk and hard copy versions are available on application to the above address.

NON-TECHNICAL SUMMARY

Introduction

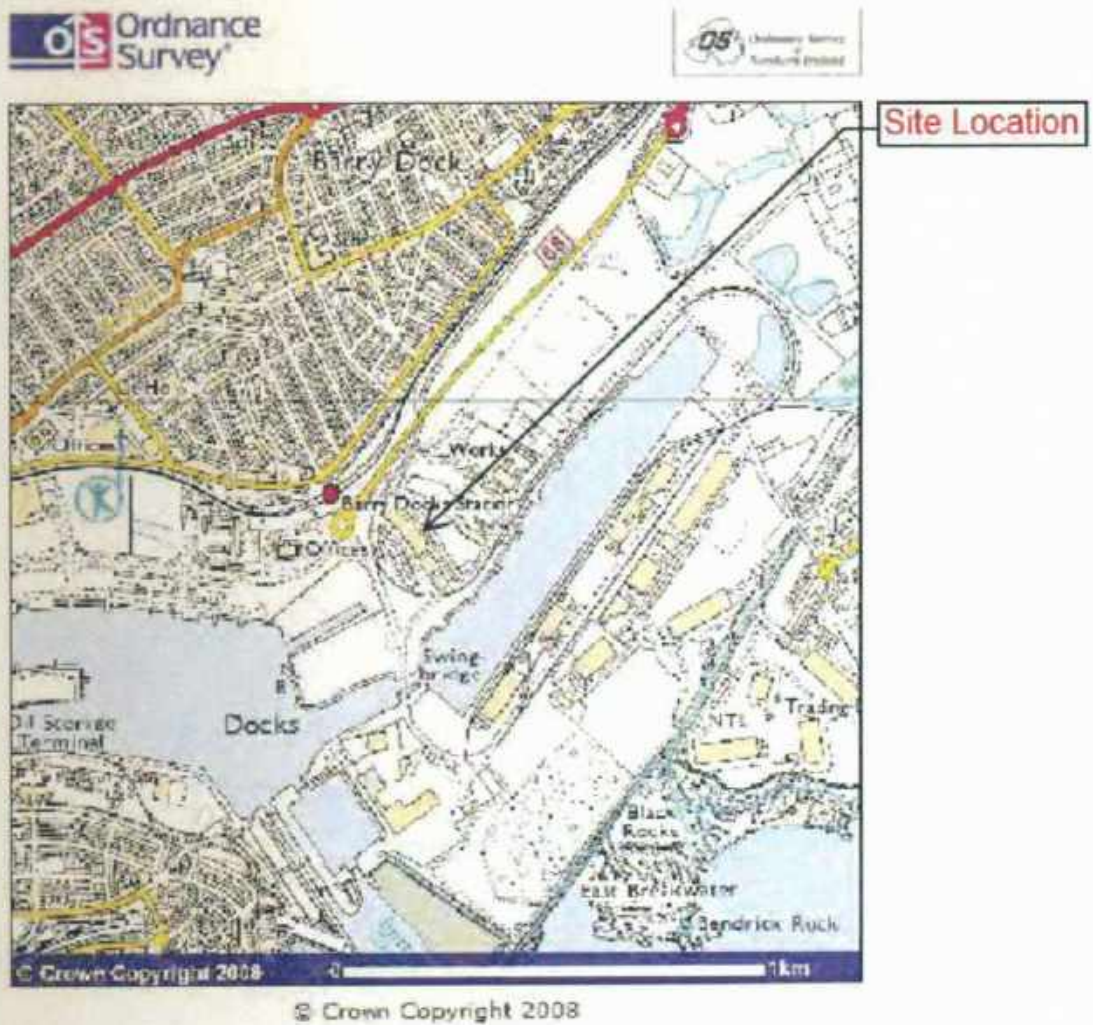
- 1.1. An Environmental Statement (ES) has been prepared on behalf of Sunrise Renewables Ltd with regard to proposals for the erection of a new industrial building and installation of 9MW fuelled renewable energy plant. A planning application (no. 2008/01203/FUL) for the proposed development was submitted to The Vale of Glamorgan Council. The application was refused and a planning appeal has now been submitted (reference: Z6950/A/09/2114605).
- 1.2. Whilst deemed not EIA development (development that will require an Environmental Impact Assessment to be undertaken), an Environmental Statement (ES) has been prepared voluntarily following advice by lawyers. The majority of the assessments and surveys required for an EIA were undertaken for the planning application. The ES unites all of the submitted documents along with a Landscape Assessment not previously seen by the Council.
- 1.3. This non-technical summary (NTS) aims to ensure that the findings of the studies undertaken as part of the EIA process can more readily be disseminated to the general public, and that the conclusions are easily understood by non-experts as well as decision makers. The NTS reflects in an accurate and balanced way the key information contained in the ES, describing all conclusions, and the facts and judgements on which they are based. The NTS is available as a separate document to facilitate wide community consultation.

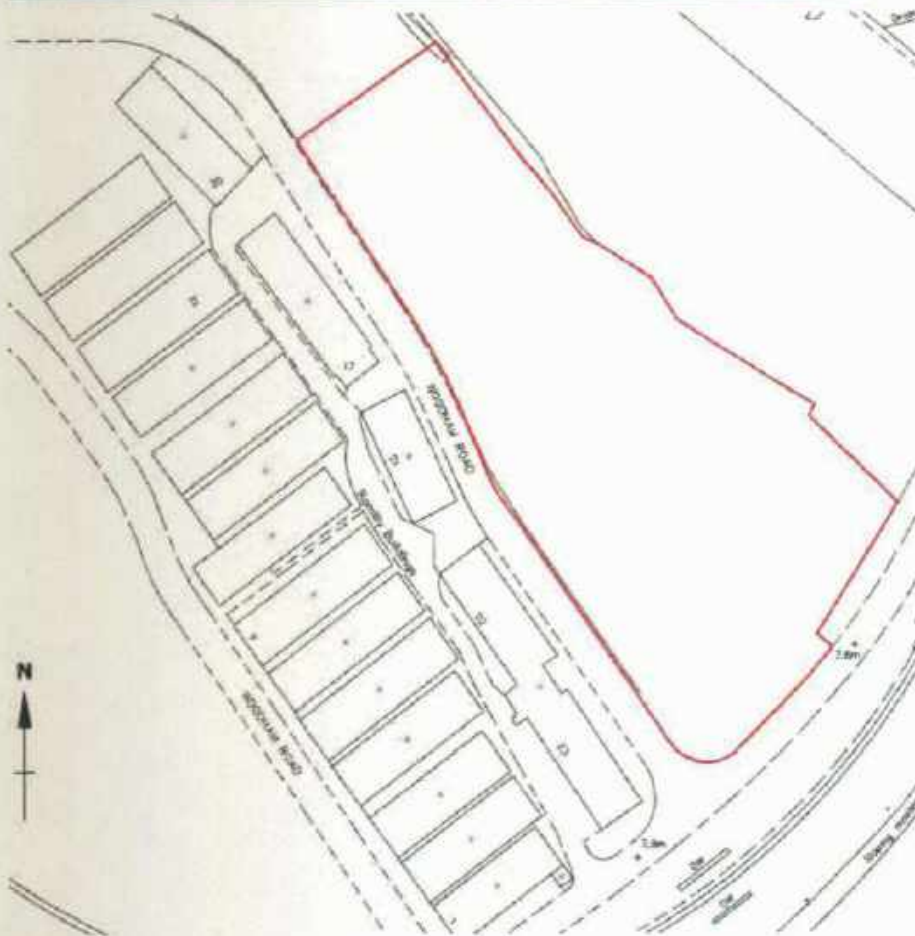
Background to the Proposals

- 1.4. Sunrise Renewables Ltd are a group of experienced professionals committed to assisting with the delivery of biomass combined heat and power projects throughout the UK. The directors have a proven track record in the assembly and delivery of "turn-key" Renewable Energy projects. The directors and a number of their advisers have spent almost three years developing a number of port site projects with the objective that each Renewable Energy plant will be owned and operated by individual companies. Sunrise

Renewables Ltd submitted proposals to Vale of Glamorgan Council to invest £20 million in developing a renewable energy biomass plant on land off Woodham Road at Barry Docks.

- 1.5. The appeal site is located on existing industrial land at the Port of Barry which is an established business and industrial area in the Vale of Glamorgan. The site location is shown below:





- 1.6. The site is partially vacant and occupied by a container storage and refurbishment operation. It is previously developed and consists only of a compacted hard standing surface which is not vegetated.
- 1.7. Biomass is the collective term for renewable biological material derived from plant and animal sources, which is used to generate heat, electricity or motive power. Biomass uses recently stored carbon, rather than old carbon stored in fossil fuels. Biomass fuel is cleaner, and in the application process meets much stricter emission controls, than conventional power plants. Biomass energy production will also save some of the 6 million tonnes of waste wood which goes into landfill each year (WRAP 2008). There are few alternative uses for recycled timber and green wood waste, and in many cases it is disposed of by landfill. Not only is this route of disposal being phased out, wood releases methane when rotting down in a landfill site. Methane is 24 times more harmful to the climate than carbon dioxide, underlining the benefits of energy recovery over landfill for this material.
- 1.8. Every ton of wood fuel used saves 593 kg coal or 270 kg natural gas. This equates to a saving in CO₂ emissions of 940 kg (coal) and 263 kg (natural gas). As a comparison, a Drax power station burns 38,000 tonnes of coal per day and is one of Europe's top five polluters.
- 1.9. The biomass plant will be a combined heat and power station, which maximises the potential to supply renewable energy to local homes. It would generate 9MWe of power, enough to provide localised heat and energy for around 15,000 homes in Barry. It would also complement the sustainable footprint of the future waterfront development by providing a source of heat and power to the area.
- 1.10. It is anticipated that the scheme will also contribute to the overall regeneration of Barry by bringing economic benefits to the town and the surrounding area. The new plant will create 50 jobs for the local community during the build of the plant and 25 permanent jobs thereafter. The permanent jobs will comprise of skilled and semi skilled workers who will be trained to high standards.

- 1.11. The application site is located at the Port of Barry. As a dedicated dock, it already handles huge volumes of forest products (Biomass) imports. To meet the demand, ABP has invested in a large number of terminals and storage facilities to accommodate a wide variety of forest products that come into and out of the ports. The site was therefore chosen as it provides greater security and sustainability over fuel supply and could potentially complement activities at the port. The site also has provides a clear ability to obtain deliveries of fuel via rail and indeed sea connections thus limiting deliveries via the local road network.
- 1.12. At local, regional and national levels, recovering energy from waste which cannot sensibly be reused or recycled is considered to be an essential component of a well-balanced energy policy. The proposed development will aid in meeting renewable energy targets that are vitally important to combating climate change.

Alternatives

- 1.13. When selecting suitable locations for its CHP plants, Sunrise Renewables Ltd has a lengthy and comprehensive list of requirements for a site including:
- Dockside location so that wood can be transported by sea;
 - Industrial location – the operational processes involved in a CHP plant are similar to those associated with industrial B2 and B8 uses and the building required is similar in appearance to industrial buildings;
 - Within close proximity of existing and proposed energy consuming land uses so that waste heat can be effectively utilized;
 - Within close proximity of waste wood processing facilities so that wood need not be transported long distances by road.
 - Close to good highway accessibility; and,
 - Within close proximity of an available connection to the National Grid.
- 1.14. The appeal site meets all of the above requirements. It is demonstrable that the requirements are such that the number of sites available as alternatives is severely

restricted. This of course is furthered by the importance of ensuring that a CHP Plant has no adverse environmental impacts. This ES demonstrates that the proposed CHP plant has no adverse environmental impacts. No alternative sites were considered.

Methodological Framework for Environmental Statement, its Author and Contributors

- 1.15. The ES follows the guidance set out in 'Environmental Impact Assessment: A Guide to Good Practice and Procedures (Department for Communities and Local Government (DCLG, 2006). It has been prepared by Sedgwick Associates in conjunction with advice provided by lawyers.
- 1.16. Part A of the ES provides the context of the Environmental Impact Assessment; a description of the proposed development is provided along with an assessment of the appeal site and its environs, and a summary of the planning policy context.
- 1.17. Part B assesses the environmental impacts relevant to the appeal proposals; it includes individual assessment chapters relating to air quality, ecology, ground conditions, landscape, noise, traffic and water resources. These chapters are written using the Surveys and Assessments undertaken for the planning application in addition to a Landscape Assessment prepared following refusal of the planning application.

Consultations Undertaken

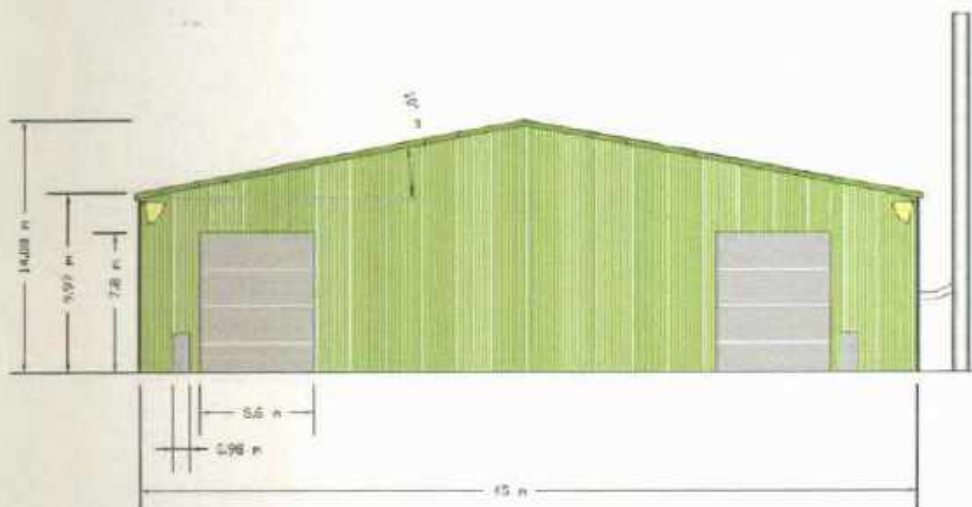
- 1.18. The following bodies were consulted during the preparation of the aforementioned reports/surveys and during the application process:
 - Barry Town Council;
 - Countryside Council for Wales;
 - Dwr Cymru/Welsh Water;
 - Environment Agency Wales; and,
 - The Vale of Glamorgan Council consultees:
 - Head of Economic Development and Leisure;
 - Director of Legal, Public Protection and Housing Services (Pollution Control);
 - Pollution Control Team;

- Head of Visible Services (Highway Development & Waste Management);
- Energy Manager.

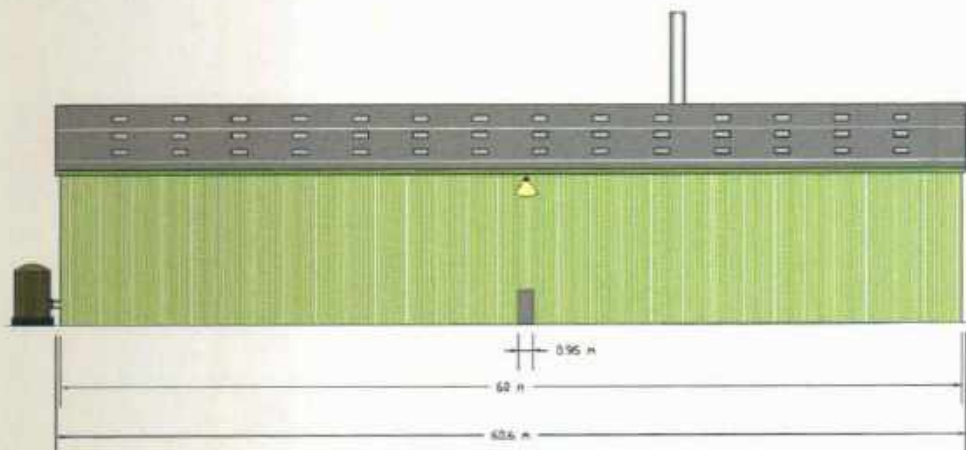
2. CONTEXT: DESCRIPTION OF DEVELOPMENT

- 2.1. The proposed Combined Heat and Power (CHP) Plant will be accommodated within a new industrial building. The proposed building will be of steel portal frame construction, to be surfaced with micro profile or box profile cladding to all external elevations. The colour and specification of the panels will be agreed with the planning authority prior to construction.

a) front elevation (from the south)



b) side elevation (from the west)





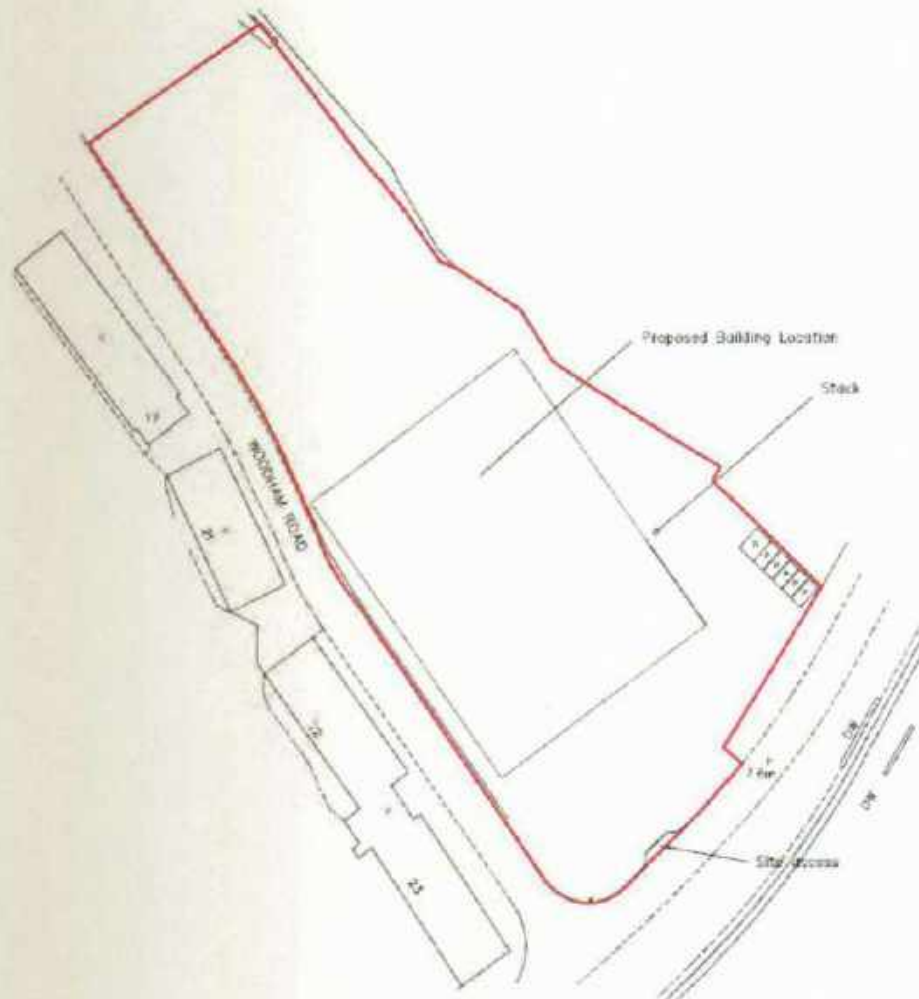
a) near elevation (from the north)



a) side elevation (from the east)

- 2.2. The site, as edged in red on the extracted plan overleaf, is already secured by a fence around part of the perimeter, much of which is in disrepair. The site will be enclosed by new galvanised steel palisade security fencing and gates to a maximum height of 2.4 metres.
- 2.3. The plant will use mobile plant i.e. a loading shovel or grab as required. A water bowser will also be available for use on site, mainly to keep dust to minimum on all vehicle running surfaces. A vacuum tanker/road sweeper or brush and shovel will be used to clean the site access road and the highway, although it is not expected to be required beyond the site construction phase. There will be sufficient space within the building for the overnight storage of plant and equipment associated with operations.

- 2.4. Directional floodlights will be used externally after official lighting up times and their location will be agreed with the local planning authority prior to installation.



- 2.5. External plant and equipment on the site will be minimal and will consist of an exhaust stack for the gas engine exhaust, which will be a maximum of 6 metres above the ridge line of the building i.e. 20 metres.

- 2.6. The specific plant equipment to be installed at the site is as follows:

<u>Type of plant/equipment</u>	<u>No.</u>	<u>Function</u>
Wood chipper	1	Size reduction of feedstock
Dryer	1	Reduction of feedstock moisture content

Grinder	1	Reduction of feedstock to <5mm size
3 MW pyrolyser	3	Heating wood waste to produce raw syngas
Gas engine (1.5 MW)	6	Burning the refined gas to produce energy
Thermal oxidiser	1	Emissions abatement
Exhaust stack	1	Emits cleaned exhaust emissions from engines

2.7. The provision of this plant will enable the pyrolysis of up to 72,000 tonnes of wood per annum. This equates to approximately 216 tonnes per day. The biomass feedstock will be provided by existing recycling and waste wood processing operations within a 15 mile radius of the site under the terms of a fuel agreement. The UK currently faces an oversupply of waste wood resulting in large volumes of wood remaining in the landfill bound waste stream or provided to uses which are unsustainable. The wood feedstock will be produced to specification at the site by appropriate chipping, shredding and screening plant equipped with magnetic separators to remove nails etc.

2.8. The process is in summary as follows:

- a. Wood fuel at up to 35% moisture content is deposited into a hopper by a wheeled loading shovel which feeds a chipper which reduces the size of the wood prior to entry into the dryer.
- b. The dryer reduces the moisture content of the wood to 10% in preparation for the grinding process.
- c. The grinder reduces the wood chips further to a sub 5mm feedstock. Excess heat from the engine exhausts is used in the drying process.
- d. The fine feedstock is delivered to a silo which enables a constant feed to the pyrolysers.
- e. The pyrolysers heat the feedstock in the absence of oxygen, a process which evolves the raw syngas from the wood fuel, which provides a constant fuel for the gas engines with the residual gas stored in the syngas buffer tank to regulate the gas flow to the engines.
- f. The engines burn the gas to produce electricity.
- g. The engines transfer electricity to the grid via an alternator, transformer and substation.

2.9. The plant will be operated during the following hours for the receipt of fuel and all other external operations, otherwise the plant will operate as a 24 hour process within the building:

Monday to Friday: 07:00 - 19:00

Saturday: 07:00 - 19:00

Sunday /Bank/Public holidays: 08:00 - 16:00

2.10. The biomass plant will operate and provide electricity to the grid 24 hours per day, with allowances for maintenance and breakdowns. The entrance gates will be closed upon the cessation of daily operations to ensure that there is no unauthorised access.

2.11. The biomass Plant requires an Environmental Permit (formerly a Pollution Prevention and Control [PPC]) permit from the Environment Agency, which will be submitted following determination of the planning appeal.

2.12. The installation of the new biomass plant is amongst the first of its kind in the UK and will result in the generation of a minimum of 25 local jobs based at the site and further jobs at the designated fuel supplier.

2.13. The applicant is also investigating the feasibility of reusing the waste thermal energy to heat adjoining offices and buildings.

3. ASSESSMENT: AIR QUALITY

Introduction

- 3.1. RSK Environment, Health and Safety Ltd (RSK) were commissioned by Sunrise Renewables to undertake an air quality impact assessment of combustion emissions from the proposed biomass power plant and in particular the potential impact of operational emissions on local residential and ecological receptors. An assessment of the effects during the construction and operational phases was undertaken and the conclusions are summarized below.

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

- 3.2. It is not expected that any impacts would arise from increased traffic emissions from construction traffic; the construction of the proposed development is not expected to result in a large number of vehicle movements.

- 3.3. There is potential for air quality impacts to arise from dust generating construction activities. However, the nearest residential properties are some #m from the site to the north; the westerly prevailing winds would ensure any impact would be low.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

- Pollutants generated from the operation of the proposed biomass power plant will disperse rapidly with distance from the site boundary and will reach background concentrations within a few hundred meters.
- Pollutant concentrations are predicted to meet relevant air quality objectives.
- The process related impacts on the ecologically sensitive sites are hence not considered to be significant.
- The impacts of the proposed biomass plant are not considered significant with regard acid deposition.

Additional Mitigation Opportunities

- 3.4. Site operations will be carried out to minimise the creation of dust. A permanent constant mains water supply will be available on site in all climatic conditions to ensure that the dust suppression systems can function effectively and all external water pipes are lagged to prevent frost damage during winter months. Dust in the hopper and conveyor area will be controlled using a hand held water hose or vacuum extraction system.
- 3.5. The site staff will continuously monitor dust emissions whilst the plant is in operation and take appropriate action when required. In addition the site supervisor will visually monitor for dust emissions at the site perimeter at least twice daily to ensure that no dust blows off the site. Results of monitoring exercises will be entered into the site diary.
- 3.6. Water sprays and/or bowsers will be used to reduce dust levels on all external site surfaces where necessary. This particularly applies to site roads, storage, loading and unloading areas. Vehicles carrying potentially dusty loads off site will be securely sheeted or sprayed with water to reduce dust emissions.
- 3.7. Stockpiles will be located within the proposed building to ensure that vehicles leaving the site cannot track through the stored material to prevent deposit of debris on the highway. The deposit of material on the highway will be treated as an emergency and will be cleaned with a road sweeper if necessary.
- 3.8. Mud/litter on roads - The deposit of material onto the access road and highway is unlikely, however if it does occur during the construction phase, for example, it will be cleared using a road sweeper or hand picked in the case of litter.
- 3.9. Visual inspections of the site surface will be carried out daily and staff will report any problems with debris on the site surface immediately to the site supervisor. Vehicles will be visually inspected before exit to check that loads are safe and that no debris is carried out on the wheels or body of the vehicle.

- 3.10. Odour - No material will be accepted which is likely to cause an odour nuisance. Any loads which are malodorous will be rejected and the Environment Agency informed. The Biomass plant itself does not produce odorous emissions.

4. ASSESSMENT: ECOLOGY – ALTHAEA HIRSUTA (ROUGH MARSH-MALLOW)

Introduction

- 4.1. A survey of the site was undertaken in January 2009 to assess its suitability for a legally protected plant species, viz. *Althaea hirsuta* (Rough Marsh-mallow), which has been recorded in the ten-kilometre grid-square. No other ecological matters require addressing as there are no other sites with sensitive flora or fauna having a statutory or local nature conservation designation within 500m of the appeal site. The nearest designated site is the SSSI named “Hayes Point to Bendrick Rock” at a distance of 616m from the site. The Local Authority was content with this approach for the planning application.
- 4.2. *Althaea hirsuta* (Rough Marsh-mallow) is listed on *Schedule 8* of the *Wildlife and Countryside Act 1981* giving it legal protection in England and Wales against intentional picking, uprooting and destruction. It was listed as ‘Endangered’ in Wiggington (1999), but it is not listed as threatened in the most recent IUCN Red List (Cheffings & Farrell 2005).
- 4.3. *Althaea* is an annual, or rarely biennial, herb with erect to decumbent stems up to 60 cm; it is coarsely hairy (hispid) and has shallowly lobed (palmate) lower leaves, and deeply divided upper leaves, all with 3-5 lobes (Stace 1997). The flowers are lilac in colour and have five petals 12 to 16 mm in length. In general appearance, it resembles other British species of the Malvaceae such as *Malva moschata* (Musk Mallow).
- 4.4. *Althaea* behaves mainly as a winter annual in Britain (rarely as a summer annual in wet seasons), flowering from May to early July and setting seed in July and August (Wiggington 1999). It is a poor competitor and requires bare soil for germination and seedling establishment. If conditions are right, germination may follow shortly after seed-set so that identifiable plants are likely to be in evidence by January.

Assessment of Effects and Significance: Construction and Operational Phases

- 4.5. No evidence of *Althaea hirsuta* (Rough Marsh-mallow) was recorded. The absence of *Althaea* cannot absolutely be ruled out from a January survey, and it is always possible

that there might be dormant seeds that could germinate in the future. But the failure to find *Althaea* or similar malvaceous species, considered together with the strongly ruderal character of the site and the lack of previous records, make it very unlikely that *Althaea hirsuta* (Rough Marsh-mallow) is present. Due it being very unlikely that *Althaea hirsuta* (Rough Marsh-mallow) is present, there is very little likelihood of the appeal proposals having any impact at all.

5. ASSESSMENT: GROUND CONDITIONS

Introduction

5.1. The potential for contaminated land has been examined and impacts on any potential receptors have been considered. Listed below are the potential contamination sources, pathways and receptors:

Sources - A contaminant is substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters

- Made ground/fill materials that were used for land reclamation and in the levelling of site after removal of railways;
- Possible asbestos-containing materials (ACMs) in the existing building fabric;
- Ground gases from nearby coal tips (if they extend below ground) and from made ground used in the reclamation works;
- Hydrocarbon impact (petrol/diesel/oils/solvents) and heavy metals associated with the sites possible use for vehicle repair/storage and use as engineering works
- Hydrocarbon (fuel and lubricating oils), ash, coal, sulphate and herbicide impact associated with sites former use as railway sidings;
- Ground gases and leachate from historic and current landfill sites;
- Organic and/or inorganic impact associated with treatment processes at adjacent historic timber yard and potentially at builders yard; and
- Hydrocarbon impact (petrol/diesel/oils/solvents) associated with adjacent coach and vehicle repair workshops.

Pathways - The route by which a receptor is being or could be exposed to, or affected by a contaminant

- Surface water run-off and/or infiltration;
- Groundwater migration into and within underlying Tidal Flat Deposits;
- Dermal contact, ingestion, dust and vapour inhalation;
- Ground gas migration in permeable soils or existing/proposed service runs;
- Root uptake; and

- Permeation of plastic utilities or attack of building infrastructure by aggressive ground conditions.

Receptors - It is either: a) a living organism, a group of living organisms, an ecological system or a piece of property that is listed in the Statutory guidance for significant harm and is being or could be harmed by contaminant or b) controlled waters which are being, or could be, polluted by a contaminant

- Shallow groundwater in the Tidal Flat Deposits or made ground;
- Surface watercourse (docks) 40m south east of the site;
- Construction workers during redevelopment works;
- Future site workers and visitors;
- Neighbouring residents 300m north west of site and adjacent workers;
- Vegetation;
- Building foundation materials and
- Infrastructure.

5.2. A linkage between the site and any neighbouring residents is considered incomplete due to the distance to the nearest residential property being in the region of 300m. Groundwater beneath the site is assumed to flow in a south westerly direction towards the entrance of the dock and hence only the neighbouring site to the north and east was considered in the preliminary risk assessment for vapour inhalation pathways to onsite receptors.

5.3. Once the redevelopment works are completed a linkage with respect to direct contact to adjacent workers is also considered incomplete owing to the hardstanding and vegetation that will limit dust generation. During redevelopment works, risks associated with dust migration can be mitigated by damping exposed soil during partially dry conditions.

5.4. In order to determine the nature, extent and source of any on-site contaminants relating to previous land workings/uses and to identify any migration of contaminants from off-

site sources, it is recommended that an intrusive geo-environmental survey be carried out. This will be done following the grant of a planning consent

6. ASSESSMENT: LANDSCAPE

Introduction

- 6.1. The Appleton Group has undertaken a Landscape and Visual Impact Assessment since the refusal of the planning application. The Vale of Glamorgan Council considered that the proposed development would have an adverse impact on the character of adjacent residential areas and on the Barry Waterfront Development which is to the west of the appeal site.

- 6.2. The site is located within the Barry Dock complex within an area of existing employment uses and disused industrial sites. The town centre is located to the northwest at higher level. The site itself is 8 metres above sea level. Access to the site is gained from a network of industrial estate roads accessed from Millennium Way, a new road to the north of the site serving the docks and new development further west. The Cardiff to Bridgend railway line is located to the north of that road, and between the road and the site is disused and overgrown land, and the dock railway spur line. Immediately adjacent to the site to the west of Woodham Road are a row of Nissen type industrial buildings accessed from Woodham Road that are in active use. Woodham Road itself is used for lorry parking). To the immediate east of the site is open, unused land and a number of fairly modern warehouse or industrial buildings, a scrap metal yard and a haulage depot. To the south of the site beyond David Davies Road, a railway line and grass is located adjacent to the Dock. Across the dock itself is an 8 storey high grain store building and open storage of containers and pallets. A large chemical works complex is present to the north east, within a distance of 1 km. The nearest residential development is located on Dock View Road to the north and at a distance of 370 metres.

- 6.3. Visual Amenity and Prominence - The site is open to view from the immediately adjacent road network. (photograph 1 of the Landscape Assessment). Scrub vegetation adjacent to the eastern boundary gives some low level screening from that direction. (Photograph 2 of the Landscape Assessment). Distant views are possible from higher ground to the north along Dock View Road (Photographs 5, 6,7 and 8 of the Landscape

Assessment). These views are all gained in the context of the Dockland as a whole with large buildings and open storage and the chemical works to the south east. The views are not constant. Vegetation adjacent to the railway line gives some screening, and progressing along the road to the north east the views become oblique and the site is difficult to identify. Views may be possible from the upper storey of the Dock office, which being on a highpoint obscures views from further west. Views from Barry Town further north are obscured by the buildings located on Dock View Road itself. Views cannot be gained from the new Millennium Way port access road due to intervening vegetation. Views cannot be gained from the railway or from Barry Dock railway Station for the same reason. Longer distant views can be gained from a residential road (Dyfrig Street) located on the eastern edge of Barry Island at a distance of 0.7 km. These views are gained in the context of existing industrial buildings to the west and east of the site, and the chemical works in the distance. Views of the site from the east/south east are not possible due to intervening dockside development.

- 6.4. Sensitivity of Receptors - From the baseline studies the following sensitive receptors are identified:
- Landscape - The quality of the site itself in terms of ecology and visual appearance is such that it is not considered to be sensitive in respect of any change that might take place.
 - Visual Impact - Views from within industrial areas are not considered to be sensitive. Views from dwellings are normally considered to be sensitive though this has to be tempered with the understanding that there is no right to a view in planning law. Views from roads are not normally considered to be sensitive as they are transient in nature. Views from public footpaths are considered to be sensitive if they are used for recreational purposes or are part of the civic realm.
- 6.5. Baseline Projection - If the site were not to be developed it is likely to remain either in its present condition (i.e. derelict and unused) or it would be redeveloped for some form of acceptable use within the use classes order. Air photograph coverage for the site shows that it was previously used for the storage of large vehicles. The Unitary Development plan shows the site within an existing employment site and within land

designated as 'Developed Coast'. The site does not fall within the area known as The Barry Waterfront which is located to the west of the site at a distance of 0.3 km. If the site remains un-used it will gradually colonise with maritime scrub vegetation.

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

- 6.6. The construction phase of development would involve the clearance of the site of existing vegetation, levelling, the excavation of ground for foundations, and the construction of an industrial building with flue stack and external parking areas. It is understood that there will be no external storage. The building size is proposed to be 60 metres x 45 metres in plan and 14.08 metres to the ridge. The flue stack indicated on the application plans is 20 metres high though it is understood that this will be lower. The colour of cladding and means of enclosure of the site are as yet undetermined.
- 6.7. In landscape terms it is not anticipated that any impacts of significance will arise. This assessment is based upon the lack of any landscape features on the site worthy of retention, and its current derelict appearance.
- 6.8. In terms of visual impact, views of the construction activity including on site plant and possibly cranes will be present for a period of 12 months. Such activity might be seen from properties located on Dock View Road, but mainly from the upper floors of properties. Longer distance views would be gained from residential properties located on Barry Island. These views will be gained in the context of adjacent industrial and dock activity. Our assessment of this impact is that it will be negligible.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

- 6.9. Landscape Impacts - There will be no adverse landscape impacts during the operational phase.
- 6.10. Visual Impacts - The only significant views will be views from domestic property located on Dock View Road and Dyfrid Street. The change in visual impact would

amount to the introduction of a new industrial building into a highly industrialised setting. The scale of the new building would be no greater than industrial units constructed to the east of the site. The flue stack would be a maximum of 20 metres high, which is only 6 metres higher than the building itself. Views gained from the properties described would be gained in the context of substantial structures located on the dockside, and a major chemical complex with numerous tall and prominent chimneys. The overriding element of the view is however the sea and the distant coast line of North Somerset. Even without mitigation we would assess any visual impact as negligible (i.e. imperceptible) assuming that the colour of the building and flue stack is appropriate to its surroundings. The flue will not emit any plume of smoke or water vapour and will cause no visual impact as the result.

- 6.11. Impact on landscape character - The existing character of the site and its surroundings is that of an industrial dockside landscape. It is described within the Unitary Development Plan as being within the developed coast. The proposed development is considered to be appropriate within its setting and there will be no adverse impact on landscape character. The site is not located within the Waterfront Regeneration area which is located to the west, and there is no inter-visibility between the two.

Additional Mitigation Opportunities

- 6.12. The planning application drawings show the building elevations to be coloured green though it is understood that the choice was indicative. In our opinion, given the location of the building, a palette of mid to dark grey would be more appropriate and we would recommend that the flue stack colour be graded from dark adjacent to the building to light grey above the roof line. Boundary treatments should be simple and be coloured black. On-site soft landscape is not considered necessary for screening purposes but if required to satisfy bio-diversity objectives could be achieved by simple blocks of salt tolerant native shrubs located immediately adjacent to the boundaries of the site.

Residual Impacts

- 6.13. The residual landscape and visual impact of the development assuming appropriate attention to building and flue stack colour would be Major beneficial.

7. ASSESSMENT: NOISE

Introduction

- 7.1. AB Acoustics were commissioned by Oaktree Environmental Ltd to undertake an environmental noise assessment.

Assessment Methodology

- 7.2. Below is a plan of the site and the location of the nearest residential properties at which the existing background noise levels were measured:



- 7.3. Location 1 was on Dock View Road opposite the junction with Castleland Street. Location 2 was at the entrance to the waste ground – which it is proposed to develop at some future date - on Cory Way. Location 3 was on the residential estate at Cei Dafydd. The noise level generated by the proposals is predicted for the residential properties at the three locations.
- 7.4. The lowest measured background noise levels were as follows:

Location 1: 41.6 dBA

Location 2: 40.1 dBA

Location 3: 40.1 dBA

- 7.5. The margin by which the noise level due to the specific noise source under investigation exceeds the background noise level enables the likelihood of complaints to be assessed. The greater this distance 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 background level this is a positive indication that complaints are unlikely.

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

- 7.6. The potential impact of noise that may be generated during the construction phase has been assessed by taking a worst case scenario of no mitigation and all plant running simultaneously. This indicates that the worst case is that noise levels are elevated at Location 1 from a background noise level of 55.6 dBA to an estimated 62 dBA. When piling operations are taken out of the calculations, and this is reasonable as they will only last for a short period of time, the overall level reduces to 59 dBA.

Additional Mitigation Opportunities

- 7.7. The main opportunity for mitigating noise concerns is for the hours of operation of plant and machinery during the construction phase to be restricted to 0700h – 1800h and this is not an unreasonable requirement.

Residual Impacts

- 7.8. With the proposed mitigation in place, there is only at worst a minor impact from the construction phase.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

7.9. The predicted noise levels were calculated based on the proposed plant having an internal noise level of no greater than 90 dBA and are as follows:

Location 1: 37 dBA

Location 2: 40 dBA

Location 3: 32 dBA

7.10. The above predicted levels are compared to the lowest measured background (L_{90}) at the various locations:

	Difference to rating level
Location 1: 41.6 dBA (00.25 – 00.35)	- 4.6 dBA
Location 2: 40.1 dBA (00.55 – 01.05)	- 0.1 dBA
Location 3: 40.1 dBA (00.40 – 00.50)	- 8.1 dBA

7.11. Therefore if the specified internal level of 90 dBA is achieved then the external level from the proposed plant at the various locations will be equal to or less than the measured background level – this is an indication that complaints about noise will not be received.

8. ASSESSMENT: TRAFFIC

Introduction

- 8.1. This section addresses the proposed plant's impact on the surrounding highway network.

- 8.2. Traffic information for the local road network was obtained from The Vale of Glamorgan. The data arose from a traffic survey carried out on 30th September 2008 and is attached as Appendix 1. The 12 hour (07:00 - 19:00) total value and the HCV (Heavy Commercial Vehicle) count focusing on both directions of travel for the 2 roundabouts near the site was used to compare and determine the vehicular movement impact for the proposed development.

Baseline Conditions

- 8.3. Below is a summary of results from 5 traffic counts using the aforementioned data.
 - Millennium Way – Dock Entrance (Wimbourne Road – A): The traffic flow that contained the highest vehicular movement was in the Cardiff Rd to Millennium Way direction with a total of 4,942 vehicular movements of which 91 were Heavy Commercial Vehicles (HCV)/HGVs. The count for Atlantic Way is still relevant despite the road being closed as it reveals the vehicle numbers travelling to the docks.
 - Millennium Way - Dock Entrance (B): The traffic flow that contained the highest vehicular movement was in the Millennium Way to Cardiff Rd direction with a total of 5,605 vehicular movements of which 100 were HCVs.
 - Millennium Way - Dock Entrance (Wimbourne Road 2 way): The two way leg on the Millennium Way road was counted at 12,541 vehicle movements in the 12 hour period of which 272 were HCVs.
 - Millennium Way - Dock Entrance (Cardiff Road 2 way): The two way leg on the Cardiff Road was counted at 12,711 vehicle movements in the 12 hour period of which 579 were HCVs.

- Millennium Way - Dock Entrance (Wimbourne Road): The two way leg on the Docks entrance was counted at 4,158 vehicle movements in the 12 hour period of which 469 were HCVs.

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

- 8.4. The construction of the proposed plant will result in insignificant volumes of traffic over a period of some 12 months.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

- 8.5. The proposed plant has a maximum fuel requirement of 216 tonnes per day. The applicant favours walking floor trailers for fuel delivery which has a payload of between 20 and 25 tonnes per load. At 20 to 25 tonnes per load the likely number of Heavy Goods Vehicle (HGV) deliveries will be between 9 and 11 loads per day. This equates to a total of 22 HGV movements per day. Some fuel will be delivered by boat but it is likely that there will be periods when dockside deliveries do not occur.
- 8.6. The results of most significance are presented in the table below, with the % increase calculations using 11 vehicles i.e. 22 movements [routes labelled A-C for ease of reference]:

Route & Direction	12 hour total vehicles	increase in total vehicle nos from HCVs	increase in HCV nos	increase in HCVs & buses
A: Millennium Way - Dock Entrance (Wimbourne Road) Millennium Way leg 2 way	12,541 vehicles 272 HCVs 459 HCVs & buses	0.18%	8.08%	4.79%
B: Millennium Way - Dock Entrance (Wimbourne Road) Cardiff Road leg 2 way	12,711 vehicles 579 HCVs 757 HCVs & buses	0.17%	3.80%	2.91%

Route & Direction	12 hour total vehicles	increase in total vehicle nos from HCVs	increase in HCV nos	increase in HCVs & buses
C: Millennium Way - Dock Entrance (Wimbourne Road) Docks Entrance leg 2 way	4,158 vehicles 469 HCVs 552 HCVs & buses	0.53%	4.69%	3.99%

8.7. The overall impact in terms of additional traffic is low and the increase in heavy vehicle traffic on the 3 routes presented in the table above range from 2.91 to an 8.08 % increase in movements. The 8.08% increase would not occur as most traffic arriving at the site would arrive from the Cardiff Road direction (route B) with the impact being an increase in HCVs of 3.8%. The increase in HCVs entering/leaving the Dock would be 4.69%. These figures are reduced further if buses are added to the heavy vehicle count.

8.8. The majority of HCV traffic coming from Cardiff Road towards Millennium Way (route B) enters the Dock so 22 additional movements added to the existing 469 is not considered significant.

8.9. The application proposals are to import fuel by road between the hours of 07:00 and 22:00, which is a 15 hour day. 11 deliveries per 15 hour day would average out at one every 82 minutes.

Additional Mitigation Opportunities

8.10. A Green Travel Plan¹ has been developed for the site and was submitted with the planning application. The Green Travel Plan demonstrates the company's awareness of its need to promote sustainable travel, and its' responsibility in reducing the impact on the local and wider environment.

¹ Green Travel Plan - #definition#

- 8.11. The applicant has already indicated that a unilateral undertaking will be signed in relation to sustainable transport contributions and would also be willing to include a traffic routing agreement to ensure vehicles adhere to agreed routes.

9. ASSESSMENT: WATER RESOURCES

- 9.1. As part of the planning application RSK Environment Ltd was commissioned to provide an assessment of Flood Risk. Consultation with the Environment Agency for Wales confirmed that the site was not at risk from flooding. As such a Flood Consequences Assessment was not required.

10. ASSESSMENT: CUMULATIVE EFFECTS

Introduction

- 10.1. This section describes the potential cumulative effects which could arise from the interaction of the proposed facility and other developments in the study area. A planning application no. 2009/00021/FUL submitted by Barry Energy Recovery Ltd for a gasification facility has been approved by the LPA providing that an s106 agreement is forthcoming. It is therefore appropriate that the cumulative impact of the two developments is assessed: these have been undertaken by RSK Group plc with regard Air Quality and AB Acoustics with regard Noise.

Air Quality

- 10.2. In-combination impacts on air quality when both the proposed biomass plant and the aforementioned gasification facility are in operation have been predicted and are as follows:
- Pollutant concentrations are predicted to meet the relevant air quality objectives at all sensitive receptor locations;
 - The process related impacts on the ecologically sensitive sites are not considered to be significant;
 - cumulative impacts of the proposed biomass plant are not considered significant with regard acid deposition;
 - pollutants generated from the operation of both the facilities will disperse rapidly with distance from the emission sources and will reach background concentrations within a few hundred metres.
- 10.3. Though the in-combination impacts are marginally higher than that predicted with independent operation of the proposed biomass plant, no exceedence of air quality objectives was predicted.

Noise

- 10.4. From the report issued by AB acoustics dated 23 December 2008 background noise levels were measured at three locations – 1 Dock View Road / Castleland Street – 2 Cory Way and 3 Cei Dafydd (Y Rhodfa) with the following results.
- 10.5. These levels are the calculated Specific Noise Level for the various:
- Location 1 : 37 dBA
 - Location 2 : 40 dBA
 - Location 3 : 32 dBA
- 10.6. With respect to the predicted levels for the Biogen Plant (taken from Table 9.5 – page 128 - of The Environmental Statement for the Barry Energy Recovery Facility prepared by Parsons Brinckerhoff Ltd) it is seen that the predicted Rating Level at the two common locations is calculated to be :
- St Mary's Avenue / Dock View Road) = 24 dBA
 - 4Y Rhodfa = 28 dBA.
- 10.7. Therefore to calculate the overall level of noise should both plants be approved then both these calculated Rating Levels need to be added together :
- Location 1 = 37 + 24 = 37 dBA
 - Location 3 = 32 + 28 = 33 (33.4) dBA
- 10.8. If these new calculated Rating Levels are then compared to the lowest measured background levels above the following results :
- Location 1 = - 4.6 dBA
 - Location 3 = - 7.1 dBA
- 10.9. Therefore if the specified internal level of 90 dBA is achieved for the Biomass Plant then the external level from the proposed plant and the additional Biogen Plant at the two locations will be less than the measured background level – this is an indication that complaints about noise will not be received.

10.10. However in the acoustic report for the Biogas Plant a lower background level (measured at approximately 01.40 – Y Rhodfa and at approximately 03.40 – Dock View Road) was recorded : these are quoted as 29 (28.5) dBA and 30 (29.7) dBA respectively. If these background levels are used then the combined effect of both plants operating with respect to background levels is :

Location 1 = +8 dBA

Location 2 = + 3 dBA

10.11. Location 1 therefore results in an increase in noise level that is between that which is considered of marginal significance and that which could result in complaints.

10.12. Therefore the external level could be reduced by either reducing the internal level within the plant to 85 dBA (rather than the 90 dBA suggested previously) or by increasing the attenuation offered by the building envelope. If a 5 dBA increase in attenuation is achieved then the increase in noise level from both plants will be below that which is considered to be of marginal significant.

11. CONCLUSIONS

- 11.1. The methodical assessment of the potential environmental impact of the development demonstrates that even prior to mitigation measures, the impact of the proposed development will be minor/negligible on ecology, landscape and traffic; there is potential for the proposals to have a moderate impact on air quality and ground conditions and a major impact on noise.
- 11.2. Following the incorporation of practical mitigation measures the proposed development will have only a minor/negligible impact on air quality, ecology, noise and traffic. There will be a moderate positive impact on ground conditions due to the removal of existing contaminants and a major positive impact on landscape due to the development of a derelict site.
- 11.3. The proposed development will have no significant short, medium or long-term adverse effects on the environment and will result in significant improvements to ground conditions and landscape.



Part A: Context

1. CONTEXT: INTRODUCTION

- 1.1. This Environmental Statement (ES) has been prepared on behalf of Sunrise Renewables Ltd with regard to proposals for the erection of a new industrial building and installation of 9MW fuelled renewable energy plant. A planning application (no. 2008/01203/FUL) for the proposed development was submitted to The Vale of Glamorgan Council.
- 1.2. Prior to submission of the application a Screening Request was made to The Vale of Glamorgan Council (VOGC) pursuant to Regulation 5 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulation 1999 [as amended]¹. Whilst the Council did not consider the proposed development to be ELA development², the Welsh Assembly Government (WAG) issued a 'Screening Direction' precluding determination of the application until such time as an ES was submitted³.
- 1.3. Detailed representations were made by the applicants to demonstrate that an EIA was not necessary⁴; WAG's amended response concluded that the proposed development is not ELA development⁵. The application was then recommended for approval to the Planning Committee but⁶ was refused on 31 July 2009⁷ for the following reasons:
- a. The proposed site for the energy plant, by reason of its proximity to nearby residential properties (especially those at an elevated height to the north), is considered to be unacceptable and resulting in an adverse impact on local residential amenity by reason of impacts relating to noise, traffic and pollution from the proposal, as well as a general adverse impact on the character of the area. Accordingly, the proposal is considered to be contrary to Policies WAST2, ENV27, ENV29, EMP2, EMP3 and

¹ Appendix 1: Screening Request

² Appendix 2: Council's response to Screening Request

³ Appendix 3: WAG Direction 01

⁴ Appendix 4: Representations made to WAG in response to direction for EIA

⁵ Appendix 5: WAG Direction 02

⁶ Appendix 6: Officer's Report to Committee (application no. 2008/01203/FUL)

⁷ Appendix 7: Decision Notice (application no. 2008/01203/FUL)

TRAN11 of the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011.

- b. The site is located in close proximity to Barry Waterfront, which is a key development site for the town of Barry and the Vale of Glamorgan as a whole, where the Council is seeking to encourage a high quality maritime development which makes an effective and positive contribution to the social, economic and environmental wellbeing of the community. By reason of the nature of the use, its associated environmental impacts and the poor public perception of such developments, it is considered that the siting of the proposed energy plant in its proposed location would represent a retrograde step for the Council's aspirations for the Waterfront, adversely affecting the amenities of the area and the future attraction of the development. Accordingly the proposal would fail to accord with the objectives of Policies ENV25 and ENV27 of the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011 and the aspirations as detailed in the approved Barry Waterfront Development Principles Supplementary Planning Guidance.

- 1.4. A planning appeal (reference: Z6950/A/09/2114605) has been submitted to the Planning Inspectorate. The appeal will be heard at public inquiry; a date for the inquiry is not known as yet. Whilst deemed not EIA development, this ES has been prepared voluntarily following advice of lawyers. The majority of the assessments and surveys required for an EIA were undertaken for the planning application. This ES unites all of the submitted documents along with a Landscape Assessment not previously seen by the Council.

Background to the Proposals

- 1.5. Sunrise Renewables Ltd is a company managed by a group of experienced professionals committed to assisting with the delivery of biomass combined heat and power projects throughout the UK. The directors have a proven track record in the assembly and delivery of "turn-key" Renewable Energy projects. The directors and a number of their advisers have spent almost three years developing a number of port site projects with the objective that each Renewable Energy plant will be owned and

operated by individual companies. Sunrise Renewables Ltd submitted proposals to VOGC to invest £20 million in developing a renewable energy biomass plant on land off Woodham Road at Barry Docks.

- 1.6. Biomass is the collective term for renewable biological material derived from plant and animal sources, which is used to generate heat, electricity or motive power. Biomass uses recently stored carbon, rather than old carbon stored in fossil fuels. Biomass fuel is cleaner, and in the application process meets much stricter emission controls, than conventional power plants. Biomass energy production will also save some of the 6 million tonnes of waste wood which goes into landfill each year (WRAP 2008). There are few alternative uses for recycled timber and green wood waste, and in many cases it is disposed of by landfill. Not only is this route of disposal being phased out, wood releases methane when rotting down in a landfill site. Methane is 24 times more harmful to the climate than carbon dioxide, underlining the benefits of energy recovery over landfill for this material.
- 1.7. Every ton of wood fuel used saves 593 kg coal or 270 kg natural gas. This equates to a saving in CO₂ emissions of 940 kg (coal) and 263 kg (natural gas). As a comparison, a Drax power station burns 38,000 tonnes of coal per day and is one of Europe's top five polluters.
- 1.8. The biomass plant will be a combined heat and power station, which maximises the potential to supply renewable energy to local homes. It would generate 9MWe of power, enough to provide localised heat and energy for around 15,000 homes in Barry. It would also complement the sustainable footprint of the future waterfront development by providing a source of heat and power to the area.
- 1.9. It is anticipated that the scheme will also contribute to the overall regeneration of Barry by bringing economic benefits to the town and the surrounding area. The new plant will create 50 jobs for the local community during the build of the plant and 25 permanent jobs thereafter. The permanent jobs will comprise of skilled and semi skilled workers who will be trained to high standards.

- 1.10. The application site is located at the Port of Barry. As a dedicated dock, it already handles huge volumes of forest products (Biomass) imports. To meet the demand, ABP has invested in a large number of terminals and storage facilities to accommodate a wide variety of forest products that come into and out of the ports. The site was therefore chosen as it provides greater security and sustainability over fuel supply and could potentially complement activities at the port. The site also has provides a clear ability to obtain deliveries of fuel via rail and indeed sea connections thus limiting deliveries via the local road network.

Background to the Application

- 1.11. This section utilizes the Officer's Report to Planning Committee for application no. 2008/01203/FUL⁸ to demonstrate the need for and importance of the proposed development.
- 1.12. With respect to Combined Heat and Power (CHP), TAN 8 (§3.6) defines it as an installation where there is simultaneous generation of usable heat and power (usually electricity) in a single process. The basic elements of a CHP plant comprise one or more prime movers usually driving electrical generators, where the heat generated in the process is utilised via suitable heat recovery equipment for a variety of purposes including: industrial processes, community heating and space heating. CHP plant allows "waste" heat produced from electricity production through thermal processes to be put to valuable use thus providing an opportunity for significant savings in carbon emissions. Local planning authorities are advised to take an active role in facilitating CHP systems through development plan and development brief processes.
- 1.13. The supporting text of Policy WAST2 of the UDP advises that, when considering proposals for any kind of waste management facility... there will be two main factors to be taken into account. The proposal must firstly be evaluated in terms of its contribution towards the South East Wales Regional Waste Plan (SEWRWP) and secondly the extent to which it meets the Council's Municipal Waste Management Strategy, demonstrating that the proposal represents the best practicable

⁸ Appendix 6
sa/ms/4116

environmental option, taking account of the principles of proximity and the waste hierarchy.

- 1.14. Looking firstly at the SEWRWP, the role of the SEWRWP is to provide a regional strategy within which local authorities and the waste management industry can plan and co-ordinate for the provision of waste facilities to meet the 2020 Landfill Directive targets by 2013. In doing so the SEWRWP identifies the number of facilities and estimate the land required for each authority within the region to meet the anticipated waste arisings.
- 1.15. For the Vale of Glamorgan, the SEWRWP identifies a need to provide for approximately 15.11 hectares of land for the provision of waste management facilities capable of serving both local and regional needs. Whilst the SEWRWP does not identify a preferred waste management technology; it does however estimate the number of facilities by technology stream for each local authority. In this respect, and in relation to the two proposed waste management facilities, the SEWRWP indicates that the Vale has a requirement for the provision of 1 Mechanical Biological Treatment (MBT) followed by a gasification facility (as proposed by application 2009/00021/FUL - Atlantic Way) and 1 MBT followed by an incineration facility (as proposed by this application).
- 1.16. In respect of this proposed facility at Woodham Road, it is noted that whilst the proposal does not involve MBT, as it would receive waste wood recovered from other MBT facilities within the region, it is considered that the facility would nevertheless assist in meeting the wider regional objectives identified within the SEWRWP.
- 1.17. Strategic UDP Policy 13 and general Policy WAST2 support, in principle, new waste management facilities where the processing of waste conforms to the Council's Waste Hierarchy (Reduction, Reuse, Recovery and Safe Disposal). In this regard the proposal would involve the recovery of energy of residual waste arisings and as such

would accord with the principles of sustainable waste management sited out within the Council's Waste Hierarchy.

- 1.18. The Council is an active member of *Prosiect Gwyrd*, a regional partnership between five South Wales councils: the Vale of Glamorgan, Caerphilly, Cardiff, Newport and Monmouthshire for the procurement of a residual waste treatment solution. The partnership is working to find a long term solution to 'residual' waste - the waste that cannot be recycled or composted – since the current system of burying waste cannot continue as Wales is running out of suitable sites (this proposal is not related to this partnership).
- 1.19. In essence, recovering energy from waste which cannot sensibly be reused or recycled is considered to be an essential component of a well-balanced energy policy, such that this proposal would be in general accordance with national and regional waste strategies.

Alternatives

- 1.20. When selecting suitable locations for its CHP plants, Sunrise Renewables Ltd has a lengthy and comprehensive list of requirements for a site including:
- Dockside location so that wood can be transported by sea;
 - Industrial location – the operational processes involved in a CHP plant are similar to those associated with industrial B2 and B8 uses and the building required is similar in appearance to industrial buildings;
 - Within close proximity of existing and proposed energy consuming land uses so that waste heat can be effectively utilized;
 - Within close proximity of waste wood processing facilities so that wood need not be transported long distances by road.
 - Close to good highway accessibility; and,
 - Within close proximity of an available connection to the National Grid.
- 1.21. The appeal site meets all of the above requirements. It is in an industrial dockside location surrounded by potential existing and proposed waste heat users. In addition

to the surrounding industrial buildings, and existing residential properties, the site is within close proximity of the Barry Waterfront development which is identified as one of WAG's Zero Carbon Development Masterplan sites 2007-11 (the appellant has a letter of support from the consortium responsible for the development in terms of reuse of waste heat). The site is also within 15 miles of waste wood processing facilities and has good highway links. A connection to the national grid has been secured.

- 1.22. It is demonstrable that the requirements are such that the number of sites available as alternatives is severely restricted. This of course is furthered by the importance of ensuring that a CHP Plant has no adverse environmental impacts. This ES demonstrates that the proposed CHP plant has no adverse environmental impacts. No alternative sites were considered.

Methodological Framework for Environmental Statement, its Author and Contributors

- 1.23. This ES follows the guidance set out in 'Environmental Impact Assessment: A Guide to Good Practice and Procedures (Department for Communities and Local Government (DCLG, 2006)). It has been prepared by Sedgwick Associates in conjunction with advice provided by lawyers. A non-technical summary is provided as part of this document and is also available separately.
- 1.24. Part A of the ES provides the context of the Environmental Impact Assessment; a description of the proposed development is provided along with an assessment of the appeal site and its environs, and a summary of the planning policy context. The following documents undertaken for the planning application have been used for Part A and are appended to this ES:
- Biomass Fuel Supply Assessment undertaken by Oaktree Environmental⁹;
 - CHPQA Assessment undertaken by Oaktree Environmental¹⁰;
 - Design and Access Statement undertaken by Oaktree Environmental¹¹;
 - Planning Statement undertaken by Oaktree Environmental¹²;

⁹ Appendix 8: Biomass Fuel Supply Assessment

¹⁰ Appendix 9: CHPQA Assessment

¹¹ Appendix 10: Design and Access Statement

- Policy Review undertaken by Oaktree Environmental¹³;
- Sustainability Statement undertaken by Oaktree Environmental¹⁴.

1.25. Part B assesses the environmental impacts relevant to the appeal proposals; it includes individual assessment chapters relating to air quality, ecology, ground conditions, landscape, noise, traffic and water resources. These chapters are written using the following Surveys and Assessments undertaken for the planning application which are appended:

Air Quality

- A report into Dispersion Modelling of Emissions to Air undertaken by RSK Group plc¹⁵.

Ecology

- Survey for *Althaea Hirsuta* (Rough Marshmallow) undertaken by RSK Group plc¹⁶.

Ground Conditions

- Environmental Data Report compiled by Groundsure;¹⁷
- Geology & Ground Stability Report compiled by Groundsure¹⁸;
- Historical Maps compiled by Groundsure¹⁹; and,
- Preliminary Risk Assessment undertaken by RSK Group plc²⁰.

Landscape

- A Landscape Assessment undertaken by Appleton Group²¹; this document did not form part of the planning application submission.

Noise

- Environmental Noise Survey undertaken by AB Acoustics²².

Traffic

¹² Appendix 11: Planning Statement

¹³ Appendix 12: Policy Review

¹⁴ Appendix 13: Sustainability Appraisal

¹⁵ Appendix 14: Report into dispersion Modelling of Emission to Air

¹⁶ Appendix 15: Survey for *Althaea Hirsuta*

¹⁷ Appendix 16: Environmental Data Report

¹⁸ Appendix 17: Geology and Ground Stability Report

¹⁹ Appendix 18: Historical Maps

²⁰ Appendix 19: Preliminary Risk Assessment

²¹ Appendix 20: Landscape Assessment

²² Appendix 21: Environmental Noise Survey

- Green Travel Plan undertaken by Oaktree Environmental²³; and,
- Transport Assessment undertaken by Oaktree Environmental²⁴.

Water Resources

- Flood Risk Assessment undertaken by RSK Group plc²⁵;

1.26. The ELA Regulations (in Schedule 4) also require that cumulative effects of development be considered within an ES. In the context of this ES, cumulative effects refer to the combined effects of the appeal proposals and different development activities within the vicinity. The cumulative assessment has been written utilizing the following:

- A report into Dispersion Modelling of Emissions to Air undertaken by RSK Group plc; and,
- Combined Plant Noise Report undertaken by AB Acoustics²⁶.

Consultations Undertaken

1.27. The following bodies were consulted during the preparation of the aforementioned reports/surveys and during the application process:

- Barry Town Council;
- Countryside Council for Wales;
- Dwr Cymru/Welsh Water;
- Environment Agency Wales; and,
- The Vale of Glamorgan Council consultees:
 - Head of Economic Development and Leisure;
 - Director of Legal, Public Protection and Housing Services (Pollution Control);
 - Pollution Control Team;
 - Head of Visible Services (Highway Development & Waste Management);
 - Energy Manager.

²³ Appendix 22: Green Travel Plan

²⁴ Appendix 23: Transport Assessment

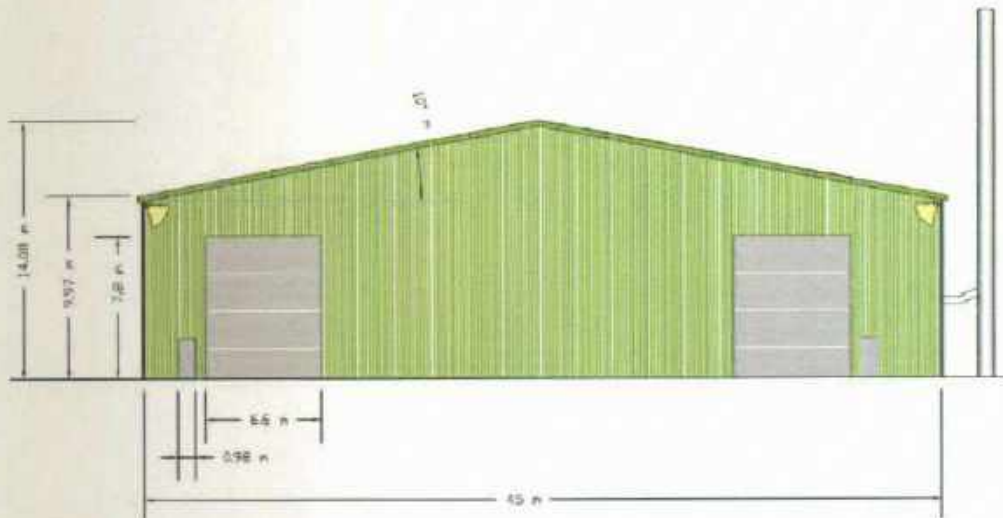
²⁵ Appendix 24: Flood Risk Assessment

²⁶ Appendix 25: Combined Plant Noise Report

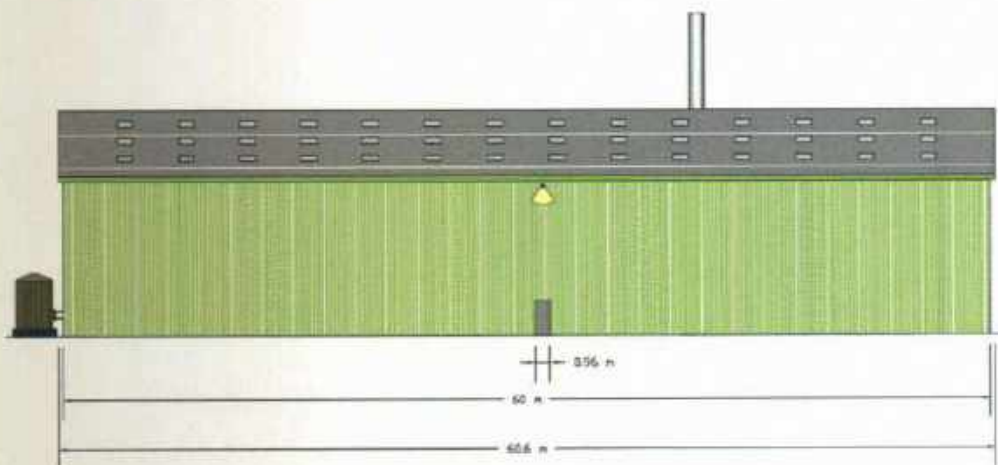
2. CONTEXT: DESCRIPTION OF DEVELOPMENT

- 2.1. The proposed CHP Plant will be accommodated within a new industrial building. The proposed building will be of steel portal frame construction, to be surfaced with micro profile or box profile cladding to all external elevations. The colour and specification of the panels will be agreed with the planning authority prior to construction.

a) front elevation (from the south)

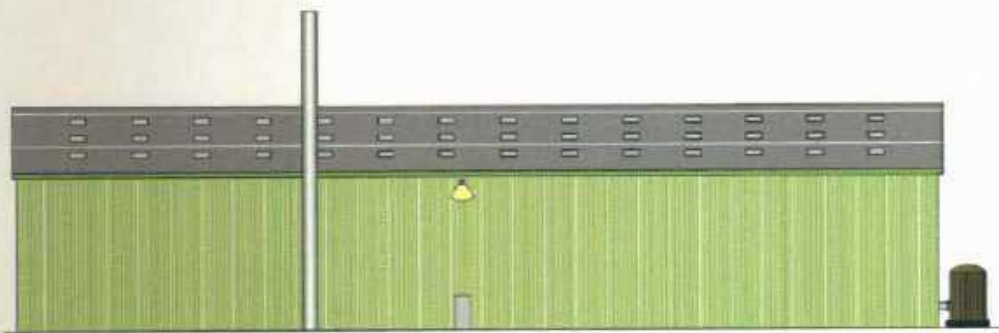


b) side elevation (from the west)





a) rear elevation (from the north)

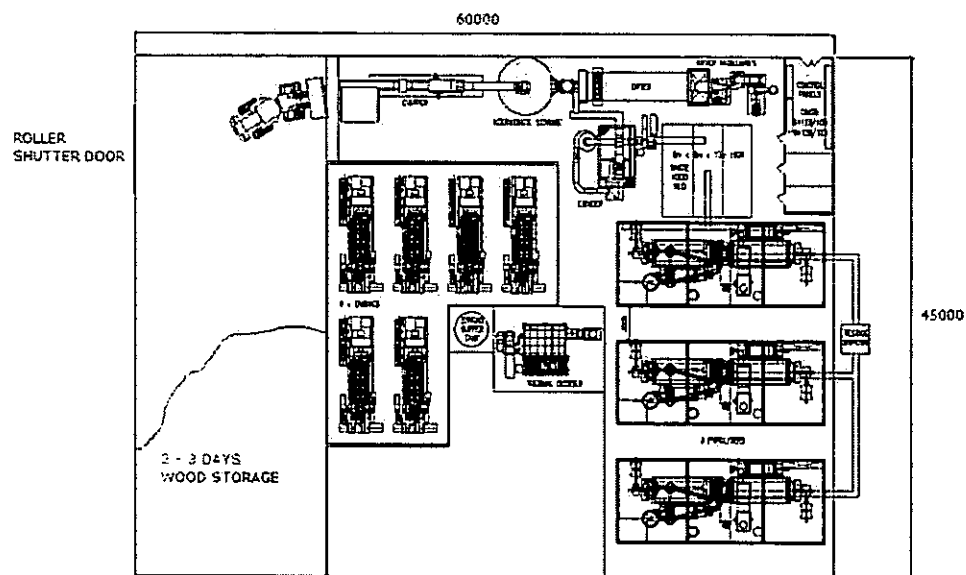


a) side elevation (from the east)

- 2.2 The roof will have rooflights to reduce the requirement for internal lighting.
- 2.3 The floor slab of the building will be surfaced with mesh or fibre reinforced concrete floor slab, the specification of which requires agreement with the Environment Agency and will be of sufficient strength for the tipping and storage of fuel and operating loading plant.
- 2.4 Internally, the building will be split into specific areas, the main subdivisions of which are summarised below:
- Storage and loading area;
 - Fuel preparation area (chipper, dryer and grinder);
 - Pyrolysers;
 - Gas engines located within an acoustic enclosure;

- Thermal oxidiser and exhaust stack; and,
- Switchroom.

2.5. The proposed internal layout is shown below. It is indicative only as the final layout will be subject to the design engineers specifications and calculations. All internal surfaces will drain to a sealed sump or foul sewer. External surfaces will drain to a sustainable surface water system and roof water will drain to a soakaway or be reused in the process.



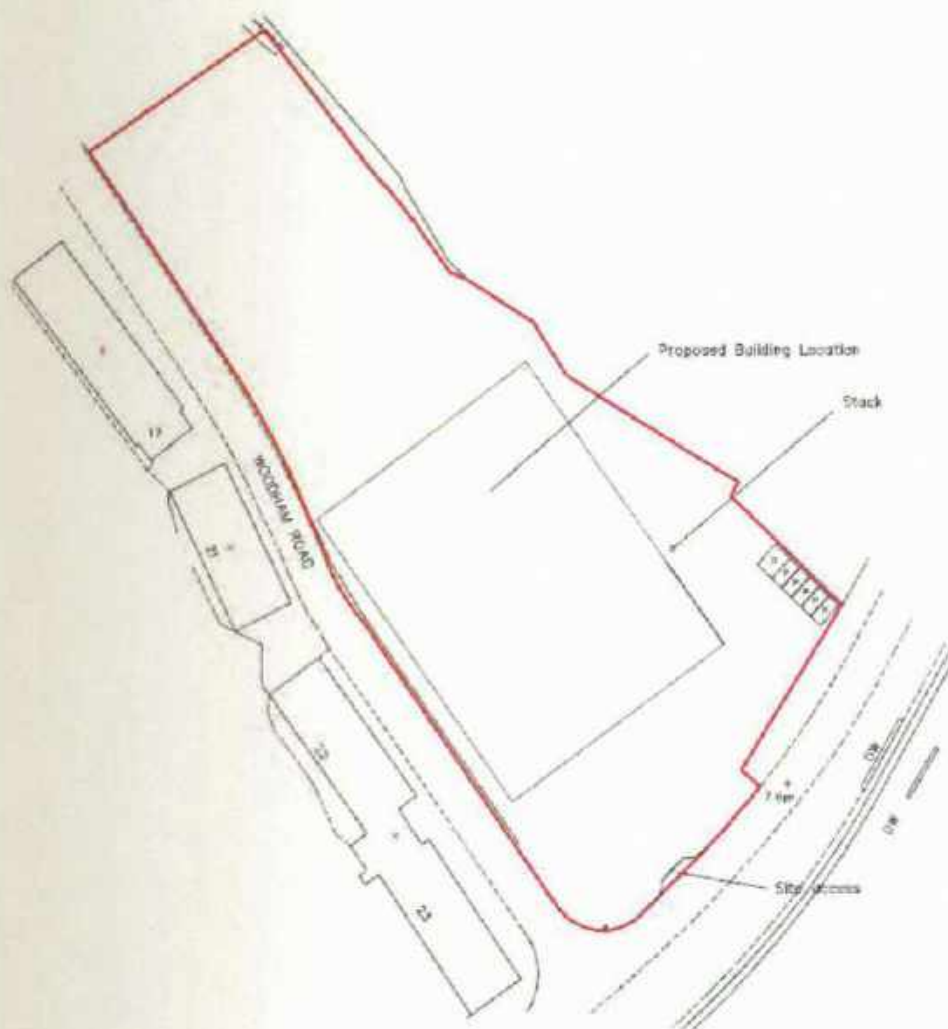
2.6. Externally, the site will be set out in accordance with and use the access/egress points shown on the site layout plan (Drawing No.SRB/003²⁷). The site is already secured by a fence around part of the perimeter, much of which is in disrepair. The site will be enclosed by new galvanised steel palisade security fencing and gates to a maximum height of 2.4 metres.

2.7. Operational space within the site is shown on Drawing No. SRB/003. The plant will use mobile plant i.e. a loading shovel or grab as required. A water bowser will also be available for use on site, mainly to keep dust to minimum on all vehicle running surfaces. A vacuum tanker/road sweeper or brush and shovel will be used to clean the site access road and the highway, although it is not expected to be required

²⁷ Appendix 26: Drawing no. SRB/003

beyond the site construction phase. There will be sufficient space within the building for the overnight storage of plant and equipment associated with operations.

- 2.8. Directional floodlights will be used externally after official lighting up times and their location will be agreed with the local planning authority prior to installation.



- 2.9. External plant and equipment on the site will be minimal and will consist of an exhaust stack for the gas engine exhaust, which will be a maximum of 6 metres above the ridge line of the building i.e. 20 metres.

- 2.10. The specific plant to be installed is as follows:

<u>Type of plant/equipment</u>	<u>No.</u>	<u>Function</u>
Wood chipper	1	Size reduction of feedstock
Dryer	1	Reduction of feedstock moisture content
Grinder	1	Reduction of feedstock to <5mm size
3 MW pyrolyser	3	Heating wood waste to produce raw syngas
Gas engine (1.5 MW)	6	Burning the refined gas to produce energy
Thermal oxidiser	1	Emissions abatement
Exhaust stack	1	Emits cleaned exhaust emissions from engines

2.11. The provision of this plant will enable the pyrolysis of up to 72,000 tonnes of wood per annum. This equates to approximately 216 tonnes per day. The biomass feedstock will be provided by existing recycling and waste wood processing operations within a 15 mile radius of the site under the terms of a fuel agreement. The UK currently faces an oversupply of waste wood for the types of reuse shown in the WRAP Wood Recycling Guide (Document SRB-I²⁸), resulting in large volumes of wood remaining in the landfill bound waste stream or provided to uses which are unsustainable. The wood feedstock will be produced to specification at the site by appropriate chipping, shredding and screening plant equipped with magnetic separators to remove nails etc.

2.12. The process is in summary as follows:

- a. Wood fuel at up to 35% moisture content is deposited into a hopper by a wheeled loading shovel which feeds a chipper which reduces the size of the wood prior to entry into the dryer.
- b. The dryer reduces the moisture content of the wood to 10% in preparation for the grinding process.
- c. The grinder reduces the wood chips further to a sub 5mm feedstock. Excess heat from the engine exhausts is used in the drying process.
- d. The fine feedstock is delivered to a silo which enables a constant feed to the pyrolysers.

²⁸ Appendix 27: Document SRB-I

- e. The pyrolysers operate on a ... principal... which evolves the raw syngas from the wood fuel, which provides a constant fuel for the gas engines with the residual gas stored in the syngas buffer tank to regulate the gas flow to the engines.
- f. The engines burn the gas to produce electricity.
- g. The engines transfer electricity to the grid via an alternator, transformer and substation.

2.13. The plant will be operated during the following hours for the receipt of fuel and all other external operations, otherwise the plant will operate as a 24 hour process within the building:

Monday to Friday:	07:00 - 19:00
Saturday:	07:00 - 19:00
Sunday /Bank/Public holidays:	08:00 - 16:00

2.14. The Biomass plant will operate and provide electricity to the grid 24 hours per day, with allowances for maintenance and breakdowns. The entrance gates will be closed upon the cessation of daily operations to ensure that there is no unauthorised access.

2.15. The Biomass Plant requires an Environmental Permit (formerly a Pollution Prevention and Control [PPC]) permit from the Environment Agency, which will be submitted following determination of the planning application.

2.16. Output calculations/projections are based on the maximum annual throughput of 72,000 tonnes of fuel and 52 weeks= operation as a 24 hour process (8,000 operational hours out of 8,760 hours per year).

- a. Input tonnages used to calculate the outputs are: Hourly - 9 tonnes; Daily - 216 tonnes; Weekly - 1,512 tonnes
- b. The pre-processing of wood waste to produce fuel off site removes the need to store large volumes of contamination such as ferrous, non-ferrous metals, plastics and fines etc.
- c. The figures given below for char and ash is combined because the plant has a combined collection bin. Both can be used for manufacturing such as building

block manufacture. The char may be reintroduced back into the process or sold as filter media.

- d. The particulates from any filter/abatement equipment produce a low volume of residues which will be bagged or discharged to sealed containers for landfill disposal unless a recovery option can be used.
- e. The stack (exhaust) will have no visible air emissions as particulates will be controlled using the abatement equipment agreed with the Environment Agency. The process does not use hot water to produce steam and all water involved in the cooling process will go to sewer.

2.17. In summary the main emissions / outputs are:

- a. Ash/ char
- b. Condensate
- c. Filtration solids similar to ash.
- d. Steam/heat
- e. Exhaust gases

2.18. The table below gives approximate figures for process outputs based on the throughput and operational hours stated in the previous paragraphs:

Table 2.1 - Process input requirements and outputs

Type	Quantity required or produced			Notes
	Hourly	Daily	Weekly	
Wood fuel	9 tonnes	216 tonnes	1512 tonnes	totals assume constant operation
Water feed input requirement	4.5 m ³	108 m ³	756 m ³	26 m ³ initial fill required, additional moisture from wood
Total recirculating cooling water	67 m ³		-	@ 30 to 40°C

Drainage/ condensate	0.75 m ³	18 m ³	126 m ³	
Char / Ash	270 kg	6.48 tonnes	45.36 tonnes	3%
Filter residues/ abatement residues (particulates)	< 1 tonne	< 1 tonne	< 1 tonne	n/a

2.19. The installation of the new Biomass plant is amongst the first of its kind in the UK and will result in the generation of a minimum of 25 local jobs based at the site and further jobs at the designated fuel supplier.

2.20. The applicant is also investigating the feasibility of reusing the waste thermal energy to heat adjoining offices and buildings. The conversion of energy in biomass to producer gas is 80%. The gas engines are compressed natural gas and combined heat and power engines. Each engine is in an acoustic enclosure to reduce noise to a minimum. The whole process is controlled from a computerised control room where all temperature and pressure sensors provide a visual display for the operator to regulate the process.

3. CONTEXT: SITE AND ENVIRONS

- 3.1. The appeal site is located on existing industrial land at the Port of Barry which is an established business and industrial area in the Vale of Glamorgan. The site location is shown on Drawing Nos. SRB/001²⁹ and SRB/002³⁰. Drawing No. SRB/001 shows the environment around the site and in particular the immediate neighbours. Desk top study information is presented in the PRA³¹ which includes plans from the Groundsure Report showing other land uses and sensitive sites within 500 metres of the application site.
- 3.2. The site is partially vacant and occupied by a container storage and refurbishment operation. The site is within an area affected by flooding and is within the indicative Zone 3 floodplain. RSK have prepared a flood risk assessment for the application in liaison with the Environment Agency. The site is not located over a groundwater Source Protection Zone (SPZ). In any event the site will not impact upon groundwater as any potentially polluting outputs will be discharged to foul sewer in accordance with the requirements of a trade effluent consent or removed from the site by vehicle.
- 3.3. The site is previously developed and consists only of a compacted hard standing surface which is not vegetated. There are no sites with sensitive flora or fauna having a statutory or local nature conservation designation within 500 metres of the site in the Groundsure Report. The nearest designated site is the SSSI named AHayes Point to Bendrick Rock at a distance of 616 metres from the site (SSSI 510 administered by the Countryside Council for Wales) and covering an area of 29 hectares.
- 3.4. The site has no clearly defined planning history but historical maps indicate that the following uses have occurred on the site:
- 1879: Undeveloped estuarine land and river bed of Cadoxton River

²⁹ Appendix 28: Drawing No. SRB/001

³⁰ Appendix 29: Drawing No. SRB/002

³¹ See Appendix 19

1898 to 1900: Land reclaimed to rail head, coal tip/loading dock

1920 to 1973: Railway engineering works/rail head

1989: Builder's yard

4. CONTEXT: PLANNING POLICY

- 4.1. This chapter provides an overview of the relevant policies of the development plan and utilizes the Planning Officer's Report to Committee for application no. 2008/01203/FUL³².
- 4.2. A key element of European Union policy that has become central to the UK's national waste strategy is the development of a waste management hierarchy. This prioritises waste management options with the overall aim of achieving a move up the hierarchy. The hierarchy is split into 4 categories in the following order:
1. Reduction - by using technology which requires less material in products and less waste in manufacturing and produces longer lasting products with lower pollution potential.
 2. Reuse - e.g. returnable bottles.
 3. Recovery - e.g. re-cycling, composting.
 4. Disposal - by incineration without energy recovery or by landfill.
- 4.3. Within this context, the following Central and local advice is of direct relevance to these proposals.

National Planning Policy

- 4.4. Planning Policy Wales (as amended by Ministerial Interim Planning Policy Statement (MIPPS) 01/2005 - Planning for Renewable Energy) emphasises the Government's general policy towards waste management, which is based on the waste management hierarchy. Paragraph 12.5.1 highlights the need for local planning authorities to make provision for establishing an integrated and adequate network of waste disposal installations.
- 4.5. In addition it reminds planning authorities that in determining applications, they are obliged by the EC Directives, to ensure that waste is recovered or disposed of without:

³² See Appendix 6
sa/ms/4116

- harming the environment;
- endangering human health;
- risking water, air, soil, plants or animals,
- causing a nuisance through noise or odours; or
- adversely affecting the countryside or places of special interest

4.6. PPW also advises that the Assembly Government is committed to playing its part by delivering an energy programme which contributes to reducing carbon emissions, having established specific renewable electricity production targets for Wales of 4TWh per annum by 2010 and 7TWh per annum by 2020. These targets should be seen in the context of the Assembly Government's overall Energy Strategy and its commitment to energy efficiency. Planning policy at all levels should facilitate both.

4.7. At §12.8.4, it advises that the aim is to secure an appropriate mix of energy provision for Wales, whilst minimising the impact on the environment, which will be achieved in part by strengthening renewable energy production. This is seen as recognising the importance of clean energy and the efficient use of natural resources, both as an economic driver and a commitment to sustainable development. It therefore advises, at paragraph 12.8.6, that "renewable energy projects should generally be supported by local planning authorities provided environmental impacts are avoided or minimised, and nationally and internationally designated areas are not compromised". In order to broaden the range of renewable energy technologies in Wales planning policy must also favour developments that support research, development and demonstration for alternative sources of renewable energy production.

4.8. Consequently, the Assembly Government is committed to:

- achieving its specific targets for renewable energy(electricity) production;
- maximising the opportunities for renewable energy (heat);
- where possible combining the two in combined heat and power systems; recognising that the benefits of renewable energy are part of its overall commitment to reduce greenhouse gas emissions.

4.9. It further advises (§12.8.12) that “Local planning authorities should facilitate the development of all forms of renewable energy and energy efficiency and conservation measures which fit within a sustainable development framework. Specifically, they should make positive provision for such development to meet society’s needs now and in the future by:

- Considering the contribution that their authority area can make towards developing and facilitating renewable energy and energy efficiency and conservation, and ensuring that development plan policies enable this contribution to be delivered.
- Ensuring that development control decisions are consistent with national and international climate change obligations, including contribution to renewable energy targets, having regard to emerging national and international policy on the levels of renewable energy required and on appropriate technologies; and
- Recognising the environmental, economic and social opportunities that the use of renewable energy resources can make to wider planning goals and objectives and the delivery of renewable energy targets.

4.10. Finally, it notes (§12.10.3) that whilst having regard to the contribution of renewable energy use to wider planning goals such as the diversification of the rural economy, local planning authorities should ensure that any potential detrimental environmental effects on local communities are minimised, to safeguard quality of life for existing and future generations.

4.11. Consultation on a Bioenergy Action Plan for Wales (February 2009) The Welsh Assembly Government has recently gone out to public consultation on their “Bioenergy Action Plan for Wales”, which seeks to build on its commitment to sustainable development, such as “One Wales”. The document states that the Assembly Government aims to use bio-energy to:

- significantly reduce greenhouse gases emissions;
- contribute to long-term fuel security;
- ensure that the public sector leads by example;
- encourage the development of sustainable forestry and agriculture; and

- support business development and job creation in all parts of the biomass energy supply chain.
- 4.12. It also advises that the Assembly Government is particularly keen to see schemes developed that maximise carbon savings; for example:
- local biomass for domestic heating, especially off the gas network;
 - biomass for CHP in industries with high heat loads;
 - local biomass for generating heat or CHP in communities;
 - biomass co-fired with coal in large, efficient power stations;
 - contaminated waste wood used in CHP or power stations which comply with waste incineration regulations;
 - residual municipal wastes, that cannot be recycled further, used to produce heat and power; and
 - agricultural slurries and food wastes used to generate biogas for local heat or CHP schemes, or for transport.
- 4.13. The stated “scenario for waste wood resource” assumes that there will be, on average, 150,000 tonnes of clean wood recoverable from waste streams in Wales, and 412,000 tonnes of possibly contaminated wood (the latter material can only be used in plant complying with waste incineration regulations).
- 4.14. A recommendation of the document is that WAG will “*work with Local Authorities, building industry and other generators of waste wood on ways to minimize contamination of wood and to segregate it from other waste streams to improve ease of collection*”.
- 4.15. This action plan complements the Renewable Energy Route Map for Wales which was issued for consultation in February 2008 and provides a more detailed assessment of the potential for bioenergy.
- 4.16. Technical Advice Note (TAN) 21 Waste (2001) also provides advice on how the land use planning system should contribute to sustainable waste resource management. Moreover, it provides advice to Local Authorities on their responsibilities in respect

of various European Directives on waste, emphasizing the importance of regional self-sufficiency and the “proximity principle”, under which waste should be handled close to the point at which it is generated.

- 4.17. Technical Advice Note (TAN) 8 Renewable Energy (2005) relates to the land use planning considerations of renewable energy. It reiterates the importance of the provision of electricity from renewable sources as an important component of UK energy policy.
- 4.18. In discussing other onshore renewable energy technologies, it also emphasizes (§3.10) that “...development plan policies should be supportive of the generation of electricity from woodfuel”, further advising that the fuel supply will clearly be an important locational factor as will the availability of a good transport infrastructure, and connection to a suitable electricity system with available capacity.
- 4.19. “Wise About Waste: The National Waste Strategy for Wales” (June 2002) also promotes a number of actions to improve the management of waste in Wales, including measures to increase the use of recycled and composted materials by businesses and the public sector in Wales, and a public sector waste minimization campaign.

Regional Guidance

- 4.20. The South East Wales Regional Waste Plan (March 2004) provides a long-term strategic waste management strategy and land-use planning framework for the sustainable management of wastes and recovery of resources in South East Wales. The Plan seeks to ensure that the South East Wales region is, as far as possible, self-sufficient in dealing with its waste arising and has adopted the following regional strategy:
- Aim to achieve the 2020 Landfill Directive targets by 2013.
 - Achieve this principally through the maximising of recycling and composting.
 - Deal with residual waste by Mechanical Biological Treatment (MBT).
 - Choose between either sending the residual waste from MBT to landfill or using it as Refuse Derived Fuel.

- Limit the amount of landfill waste to that which cannot be dealt with acceptably in any other way.
- 4.21. The role of the SEWRWP is to provide a regional strategy within which local authorities and the waste management industry can plan and co-ordinate for the provision of waste facilities to meet the 2020 Landfill Directive targets by 2013. In doing so the SEWRWP identifies the number of facilities and estimate the land required for each authority within the region to meet the anticipated waste arisings.
- 4.22. Consultation has been undertaken on the 1st review of the SEWRWP, but as yet this has not been published. This consultation document is considered to be of relevance to the determination of this application, insofar as it makes considerable reference to 'recovery of energy' through Energy from Waste (EfW), this being a process where energy in the form of heat and / or power is recovered from burning waste.

Local Policy

- 4.23. Both the Welsh Assembly Government's "Wise about Waste" Strategy and the South East Wales Regional Waste Plan have informed the Council's Municipal Waste Management Strategy (August 2004), which establishes how the Council will meet various waste reduction and recycling targets established in these documents. Similarly, the aim of the policies and proposals contained within this Plan is to facilitate the development of waste management facilities that meet the Council's requirements both locally and regionally.
- 4.24. The Municipal Waste Plan, however, is now out of date and (according to the Council's Waste section) no longer represents the policies of the Council since resolving to join the *Prosiect Gwyrdd* Residual Waste Partnership. This partnership approach is committed to residual municipal waste treatment which is technology neutral, in contrast to the existing Municipal Waste Management Strategy which reflects the preference for Mechanical Biological Treatment (MBT). Meeting WAG targets for municipal waste would now not permit a MBT option without an EFW end use options.

Unitary Development Plan

- 4.25. The Development Plan for the area comprises the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011, which was formally adopted by the Council on 18 April 2005.
- 4.26. Under the chapter on Waste, the following objectives are put forward for the purposes of guiding future decisions relating to waste disposal:
- To ensure that waste disposal is carried out with adequate environmental protection, so that there is no harm to human health, no pollution of the environment and no detriment to the amenities of the locality.
 - To ensure that the waste disposal requirements of the County are adequately catered for within the context of other objectives.
 - To ensure that waste disposal and other types of waste management facilities are considered within a hierarchy of priorities including:
 - Reduce (the production of waste)
 - Re-use
 - Recover (recycling, composting and energy recovery)
 - Disposal (with minimum environmental impact)
- 4.27. The UDP as a whole includes the following policies which are of relevance to these proposals.
- 4.28. Strategic policy 13 – favours development proposals which encourage sustainable principles for waste disposal based on a hierarchical approach of (i) waste minimisation / avoidance; (ii) re-use of waste; (iii) waste re-cycling or recovery (including waste conversion to energy); and (iv) waste disposal land fill with minimal environmental impact.
- 4.29. WAST 1 provision of waste management facilities - Proposals for the provision of waste management facilities including the handling, treatment and transfer of waste will be permitted where they are located on:

- i. Existing waste sites;
- ii. Existing and allocated B2 and B8 employment sites;
- iii. Within operational mineral working sites; or
- iv. The case of green waste composting and management, on land within or adjacent to farm building complexes.

4.30. Proposals will be considered having regard to the criteria listed in Policy WAST 2. WAST 2 criteria for assessing waste management facilities. Subject to the provision of Policy WAST 1 proposals for waste management facilities will be permitted if the proposal:

- i. Conforms with the principle of the waste hierarchy (reduction, re-use, recovery and safe disposal); the "proximity principle"; the principle of regional self sufficiency; the objective of waste avoidance, reduction and disposal; the setting of targets for reduction and modes of disposal:
- ii. Does not unacceptably affect residential amenity or pose a threat to public health;
- iii. does not unacceptably affect the quality or quantity of water resources (both surface and groundwater);
- iv. has regard to the adequacy of the highway network and the need to minimise the demand on the transport network;
- v. does not unacceptably conflict with the interests of agriculture, nature conservation, areas of ecological, wildlife or archaeological importance or features of geological or geomorphological importance or landscape protection policies;
- vi. has a high standard of layout, landscaping and design;
- vii. provides arrangements for the after treatment and future use of the site which are to the satisfaction of the local planning authority; and
- viii. is not at an unacceptable risk of flooding, including tidal inundation, or does not increase the risk of flooding elsewhere

4.31. §10.6.7. of the justification advises that the disposal or treatment of waste in any form is often a controversial issue, no matter how well managed. It is important therefore that any proposals for this type of activity can be thoroughly assessed against the above criteria and that any permissions are conditioned to mitigate and / or abate environmental detriment and nuisance.

- 4.32. COMM 8 Other renewable energy schemes - Proposals for other renewable energy schemes will be permitted if all of the following criteria are met:
- i. the proposal has no unacceptable effect on the immediate and surrounding countryside;
 - ii. the proposal has no unacceptable effect upon the sites of conservation, archaeological, historical, ecological and wildlife importance;
 - iii. adequate measures are taken, both during and after construction, to minimise the impact of the development on local land use and residential amenity.
- 4.33. §11.4.45. of the justification states that "...the Council recognises that policies for developing renewable energy must be weighed carefully with its continuing commitment to policies which seek to protect the local environment. The Council acknowledges the advice in TAN 8 that proposals to harness renewable energy can display a variety of factors peculiar to the technology involved. ... The Council will assess applications for renewable energy developments in the light of the guidance put forward by the Welsh Assembly Government in TAN 8.
- 4.34. ENV 6 East Vale coast - States that development within the undeveloped coastal zone will be permitted if a coastal location is necessary for the development; and the proposal would not cause unacceptable environmental effects. In areas of existing or allocated development within the coastal zone, any new proposal should be designed with respect to its local context and sensitive to its coastal setting.
- 4.35. The justification notes that, "though outside of the defined settlement boundary for Barry, the Port estate is clearly a developed area and its continued use and development as a commercial/ industrial estate and for the expansion of operational port facilities by ABP is endorsed". (3.4.22 of UDP).

ENV7 - WATER RESOURCES

ENV16 -PROTECTED SPECIES

ENV18 - ARCHAEOLOGICAL FIELD EVALUATION

ENV26 CONTAMINATED LAND AND UNSTABLE LAND

ENV27 - DESIGN OF NEW DEVELOPMENTS

ENV29 - PROTECTION OF ENVIRONMENTAL QUALITY

- 4.36. States that development will not be permitted if it would be liable to have an unacceptable effect on either people's health and safety or the environment: (i) by releasing pollutants into water, soil or air, either on or off site; or (ii) from smoke, fumes, gases, dust, smell, noise, vibration, light or other polluting emissions.
- 4.37. EMP2 New business and industrial development - States, inter alia, that proposals for new business and industrial development will be permitted if nine specified criterion are met, including that the size and relationship of any new building and / or alteration or extension is not disproportionate to its size and setting; the proposal does not have an unacceptable effect on residential amenity; does not present additional risk to the health or safety of users of the site and does not unacceptably pollute air, water, or land; and does not unacceptably affect the use of the adjoining land by virtue of the risk and impact of potential pollution.
- 4.38. EMP3 General industry - States, inter alia, that development will be permitted for B2 use (general industry) where the proposal is compatible with existing business / industrial / warehousing uses; will not cause detriment to the amenities of nearby residential areas; the nature and scale of the proposed development does not unacceptably affect surrounding uses; it does not present additional risk to the health or safety of users of the site and does not unacceptably pollute air, water or land; and it does not unacceptably affect the use of the adjoining land by virtue of the risk and impact of potential pollution.
- 4.39. TRAN10 – Parking; TRAN11 - Road freight - States, inter alia, that, in order to reduce the unacceptable environmental effects of heavy goods vehicles...developments which generate HGV movements which would unacceptably affect the amenity and character of the existing or neighbouring environments by virtue of noise, traffic congestion, or parking problems will not be permitted.



Part B: Assessment

5. ASSESSMENT: AIR QUALITY

Introduction

- 5.1. RSK Environment, Health and Safety Ltd (RSK) were commissioned by Sunrise Renewables to undertake an air quality impact assessment of combustion emissions from a proposed 9 MWe biomass power plant in Barry, South Wales. The plant has been designed to pyrolyse fuel derived from waste wood to produce syngas, which is turn is used as fuel in gas engines to generate electricity. Detailed dispersion modelling of stack emissions from the proposed plant was undertaken in response to comments by the relevant local authority, the Vale of Glamorgan Council (VOGC), to identify potential air quality impacts. In particular, the potential impact of operational emissions on local residential and ecological receptors, including Sites of Special Scientific Interest (SSSI).

Assessment Methodology

- 5.2. Legislation and Assessment Criteria - UK air quality policy is published under the umbrella of the Environment Act, 1995, Part IV and specifically Section 80, the National Air Quality Strategy (NAQS). The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working Together for Clean Air, published in July 2007, sets air quality standards and objectives for ten key air pollutants to be achieved between 2003 and 2010.
- 5.3. The air quality standards in the UK are derived from European Commission (EC) Directives. The EU Air Quality Framework Directive (1996)⁽³³⁾ established a framework under which the EU could set limit or target values for specified pollutants. The Directive identified twelve pollutants for which limit or target values have or will be set in subsequent Daughter Directives. The first of these Daughter Directives⁽³⁴⁾, relating to sulphur dioxide (SO₂), fine particles (PM₁₀), oxides of nitrogen (NO_x) and lead (Pb), was formally adopted in April 1999, and was required to be implemented by all Member States by July 2001.

³³ Council Directive 1996/62/EC Framework Directive on Ambient Air Quality Assessment and Management 27 Sept 1996.

³⁴ Council Directive 1999/30/EC of 22 April 1999 relating to limit values for SO₂, NO₂, NO_x, particulate matter and lead in ambient air.

5.4. Relevant regulations applicable in Wales include:

- The Air Quality (Wales) Regulations 2000 (S.I. 2000/1940) (W.138);
- The Air Quality (Amendment) (Wales) Regulations 2002 (S.I. 2002/3182) (W.298);
- The Air Quality Limit Values (Wales) Regulations 2001 (S.I. 2001/2683) (W.224);
- Air Quality Limit Values (Wales) Regulations 2002 (S.I. 2002/3183) (W.299);
- The Air Quality (Ozone) (Wales) Regulations 2003 (S.I. 2003/1848) (W.198);
- The Air Quality Limit Values Regulations (2003) (S.I. 2003/2121);
- The Air Quality Limit Values (Wales) (Amendment) Regulations 2005 (S.I. 2005/1157) (W.74); and,
- The Air Quality Standards (Wales) Regulations (2007) (S.I. 2007/717) (W.63).

5.5. The primary emission components of concern resulting from the combustion of syngas in the proposed power plant are considered to be nitrogen oxides (NO_x), sulphur dioxide (SO₂), fine particles (PM₁₀) and carbon monoxide (CO). These parameters are subject to the air quality objectives set out in the UK National Air Quality Strategy (NAQS), as presented below table 5.1. Other emissions including dioxins, hydrogen chloride (HCl), hydrogen fluoride (HF) and mercury (Hg) are not considered to be significant.

5.6. In addition to the UK NAQS, the Environment Agency's Integrated Pollution Prevention and Control Horizontal Guidance Note 1 (IPPC H1, 2003) provides environmental benchmarks for the protection of human health for hydrogen chloride (HCl), hydrogen fluoride (HF) and mercury (Hg) as identified in Table 5.2. Both HCl and HF have the potential to contribute to acid deposition effects. No guideline level is available for dioxins.

AMBIENT

Table 5.1: UK National Air Quality Strategy Objectives

Emission Parameter	Intention	Period of Exposure	Air Quality Objective	Attainment Date
NO ₂	Protection of human health	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times per calendar year (99.79th percentile)	31 December 2005
	Protection of human health	Annual mean	40 µg/m ³	31 December 2005
NO _x	Protection of ecosystem health	Annual mean	30 µg/m ³	31 December 2000
CO	Protection of human health	Running 8-hour mean	10 mg/m ³	1 December 2003
Particles PM ₁₀	Protection of human health	24-hour mean	50 µg/m ³	31 December 2004
	Protection of human health	Annual mean	40 µg/m ³	31 December 2004
SO ₂	Protection of human health	15-min mean	266 µg/m ³	31 December 2005
	Protection of human health	1-hour mean	350 µg/m ³	31 December 2004
	Protection of human health	24-hour mean	125 µg/m ³	31 December 2004
	Protection of ecosystem health	Annual mean	20 µg/m ³	31 December 2000

Nitrogen dioxide
Nitrogen oxide
Carbon monoxide

Sulphur dioxide

Table 5.2: Environmental Benchmarks for HCl and HF

Emission Parameter	Intention	Period of Exposure	Air Quality Objective
HCl	Protection of human health	1-hour mean	800 µg/m ³
		Annual mean	20 µg/m ³
HF	Protection of human health	1-hour mean	250 µg/m ³
Hg	Protection of human health	1-hour mean	7.5 µg/m ³
	Protection of human health	Annual mean	0.25 µg/m ³

Hydrogen chloride
Hydrogen fluoride
Mercury

FROM THE PROCESS

5.7. Model Description - AERMOD is a state-of-the-science dispersion modelling system that simulates essential atmospheric physical processes and provides refined concentration estimates over a wide range of meteorological conditions and modelling scenarios. It is based on atmospheric boundary layer turbulence structure and scaling concepts, including treatment of multiple ground-level and elevated point, area and volume sources. It handles flat, complex, rural or urban terrain and

includes algorithms for building effects and plume penetration of inversions aloft. It uses Gaussian dispersion for stable atmospheric conditions (i.e. low turbulence) and non-Gaussian dispersion for unstable conditions (i.e. high turbulence).

- 5.8. AERMOD includes two data pre-processors for streamlining data input. AERMET, a meteorological pre-processor, computes boundary layer and other necessary parameters for use with AERMOD and accepts data from both on-site and off-site sources. AERMAP is a terrain pre-processor that simplifies the computation of receptor elevations and effective height scales for numerous types of digital data formats, including USGS 1 Degree and 7.5 minute digital elevation model (DEM) files and U.K. Ordnance Survey® digital elevation data.
- 5.9. Breeze AERMOD GIS Pro v.7.0.21 was used in this study for assessing potential air quality impacts. The model is considered by the UK Environment Agency to be appropriate for assessments of the nature described in this report.
- 5.10. Emission Source Parameters - The only significant source of emissions to air from:
- 1 X 9 MWe Biomass Plant (fuel: syngas derived from waste wood).
- 5.11. As the proposed biomass plant utilizes waste wood, emissions from the plant should be compliant of the Waste Incineration Directive (WID)³⁵. The maximum emission releases stipulated by WID are identified in Table 5.3.

Table 5.3 Emission Limit Values Stipulated By the Waste Incineration Directive

Pollutant	Emission Limit Value [†] , mg Nm ⁻³
Nitrogen oxides (expressed as nitrogen dioxide)	200
Particulate Matter (PM10)	10
Sulphur dioxide	50
Carbon monoxide	50
Hydrogen chloride	10
Hydrogen fluoride	1
Mercury compounds (expressed as mercury)	0.05
Dioxins and Furans	0.1 ng m ⁻³

³⁵ WID: The Directive on the Incineration of Waste. Also, the Environmental Permitting Guidance, Environmental Permitting (England and Wales) Regulations 2007, Department for Environment Food and Rural Affairs (DEFRA), <http://www.defra.gov.uk>.

Note: The reported values are at temperature 273°K, pressure 101.3 kPa, 11% oxygen and dry gas conditions and refer to the daily average concentration limit values.

- 5.12. Pollutant Emission Concentrations From A Similar Plant - For a similar plant of capacity 3 MW electricity generation capacity (Rhymney Organic Regeneration Facility, Hudol Thermal Treatment Unit 15, Capital Valley Industrial Estate, Rhymney, Caerphilly, NP22 5PT; The plant gasifies a range of biomass and oily sludge wastes), the Environment Agency stipulated the pollutant emission limit values identified in Table 5.4 for the key air pollutants.

Table 5.4 Pollutant Emission Concentrations Stipulated By The UK Environment Agency For Rhymney Organic Regeneration Facility

Pollutant	Pollutant Emission Concentration, mg m ⁻³	
	Daily Average Limit	Half-hourly Average Limit
Nitrogen oxides (expressed as nitrogen dioxide) (NO _x)	90	100
Particulate Matter (PM ₁₀)	7	10
Sulphur dioxide (SO ₂)	20	30
Carbon monoxide (CO)	10	15
Hydrogen Chloride (HCl)	1	16
Hydrogen Fluoride (HF)	1	4
Mercury (Hg)	0.05 mg m ⁻³ (Average over a period of 30 minutes and 8 hours)	
Dioxins and Furans	0.1 ng m ⁻³ (Average over a period of 6 and 8 hours)	

Source: Draft Permit With Introductory Note (Permit Number ZP3535MW) Issued by the UK Environment Agency.

- 5.13. Whilst the emissions from the proposed development are similar that identified in Table 5.4 (for a similar plant), the proposed plant will be WID compliant. To conservatively assess the air quality impacts, higher of the daily average pollutant emission concentrations (that stipulated by WID as identified in Table 5.3) have been included in the assessment. The emission parameters included in the dispersion modelling study are summarised below in Table .

Table 5.5: Emission Parameters for Sources Included in the Dispersion Model

Emission Source	Biomass Plant
Source Location (Easting, Northing)	312647, 167668
Stack Height, m (from ground level)	20
Stack Diameter, m	0.9
Efflux Temperature, deg K	598
Efflux Velocity, m/s	14

Pollutant Emission Concentrations, mg Nm⁻³	
Nitrogen oxides NO _x (expressed as nitrogen dioxide, NO ₂)	200
Particulate Matter (PM10)	10
Sulphur dioxide	50
Carbon monoxide	50
Hydrogen chloride	10
Hydrogen fluoride	1
Mercury compounds (expressed as mercury)	0.05
Dioxins and Furans	0.1 ng m ⁻³
Pollutant Emission Rates, g/s	
NO _x	0.8132
PM ₁₀	0.0407
SO ₂	0.2033
CO	0.2033
HCl	0.0407
HF	0.0041
Hg	0.0002
Dioxins and Furans	4.07 x 10 ⁻¹⁰

- 5.14. Maintenance of a log of all abnormal operations and associated emissions to air will be a requirement of the Environmental Permit issued and regulated by the Environment Agency. The log will be completed during the operational phase of the development.
- 5.15. Modelled Scenario - In order to characterise potential worst-case air quality impacts resulting from emissions from the power plant stack, it was assumed that the plant was operating continuously throughout the year. This is considered appropriate to capture the variation in meteorological conditions over a given year and, therefore, worst-case dispersion profiles.
- 5.16. Modelled Domain - Two grid domains (far-field and near-field) were incorporated in the dispersion model to capture the coarse and fine scale variation in predicted pollutant concentrations with distance. Both domains were approximately centred on the proposed power plant site. The far-field domain covered an area of approximately 20 km by 20 km, and had a grid resolution/spacing of 250 m. The near-field domain covered an area of approximately 3 km by 3 km and had a grid resolution/spacing of 30 m. The grid reference of the southwest and northeast corner of each grid domain is identified below in Table 5.6.

Table 5.6 Extent of Modelled Grid Domains

Location	Far-field (20 km x 20 km coarse receptor grid; 250 m spacing)		Near-field (3 km x 3 km fine receptor grid; 30 m spacing)	
	x	y	x	y
Southwest corner of grid domain	302719.6	160157.8	311147	166168
Northeast corner of grid domain	322719.6	180157.8	314147	169168

5.17. Discrete Receptors - In addition to the near-field and far-field grid domains discussed above, pollutant concentrations were also predicted at all important/designated ecological sites within 10 km of the proposed power plant. The location of all assessed receptors included in the model are presented below in Table 5.7. The coordinates approximately represent the nearest point on the sensitive site to the proposed power plant. Existing and proposed residential properties close to the site were also included in the model.

Table 5.7 Discrete Receptors Included in the Dispersion Model

Receptor Name	Receptor Reference Number (As Included in Dispersion Model)	Designation	Grid Reference		Habitat for Nitrogen and Acid Deposition
Barry Island	1	SSSI	311182	166346	Carboniferous Limestone ¹
Cliff Wood - Golden Stairs	2	SSSI	309468	167132	Mixed Woodland
Coedydd Y Barri/Barry Woodlands	3	SSSI	309182	168632	Semi-natural Broadleaved woodland
Cog Moors	4	SSSI	315719	169204	Unimproved Grassland ²
Cosmeston Park	5	SSSI	316826	169168	Open Water, Fern, Woodland and Remnant Limestone Grassland
Cwm Cydfin, Leckwith	6	SSSI	316433	173812	Mixed Woodland
East Aberthaw Coast	7	SSSI	305039	165703	Rocky and Sandy Shore, Shingle Spits, Saltmarsh, Relict sand Dunes and Liassic Limestone Cliffs
Ely Valley	8	SSSI	311436	175715	-

Receptor Name	Receptor Reference Number (As Included in Dispersion Model)	Designation	Grid Reference		Habitat for Nitrogen and Acid Deposition
Flat Holm	9	SSSI	321755	164775	Coarse Grassland ²
Hayes Point to Bendrick Rock	10	SSSI	312968	166811	Wave-Rippled Siltstones and Fine Sandstones ³
Nant Whitton Woodlands	11	SSSI	306610	171633	Mixed Woodland
Penarth Coast	12	SSSI	317505	167596	Calcareous Grassland and Cliff-top Scrub
Severn Estuary	13	SSSI	319626	172368	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Sully Island	14	SSSI	316540	166918	Rocks include a series of Breccias and Sands ³
Severn Estuary	15	Ramsar Site and Special Protection Area	318851	168061	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Severn Estuary	16	Special Area of Conservation	318893	167958	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Severn Estuary - Sully Island	17	Important Bird Area	316540	166918	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Residential Receptor 1	18	Property near junction of Dock View Road and Castleland Street	312387	167970	-
Residential Receptor 2	19	Property near junction of Dock View Road and George Street	312460	168045	-
Residential Receptor 3	20	Property on Dyfrig Street	312073	166912	-
Residential Receptor 4	21	Property of Barry Docks Waterfront Development Phase 1	311975	167617	-

Receptor Name	Receptor Reference Number (As Included in Dispersion Model)	Designation	Grid Reference		Habitat for Nitrogen and Acid Deposition
Residential Receptor 5	22	Proposed Property of Barry Docks Waterfront Development Phase 2	312356	167409	-
Residential Receptor 6	23	Property on Bendrick Road	313443	167554	-
Residential Receptor 7	24	Property on Hayes Road	313644	167729	-
Residential Receptor 8	25	Property at Residential area NE of Industrial Area	313380	168850	-

Notes: SSSI = Site of Special Scientific Interest; SAC= Special Area of Conservation; SPA = Special Protection Area.

¹Relevant habitat not listed by Air Pollution Information Service so assumed habitat to comprise of limestone pavement.

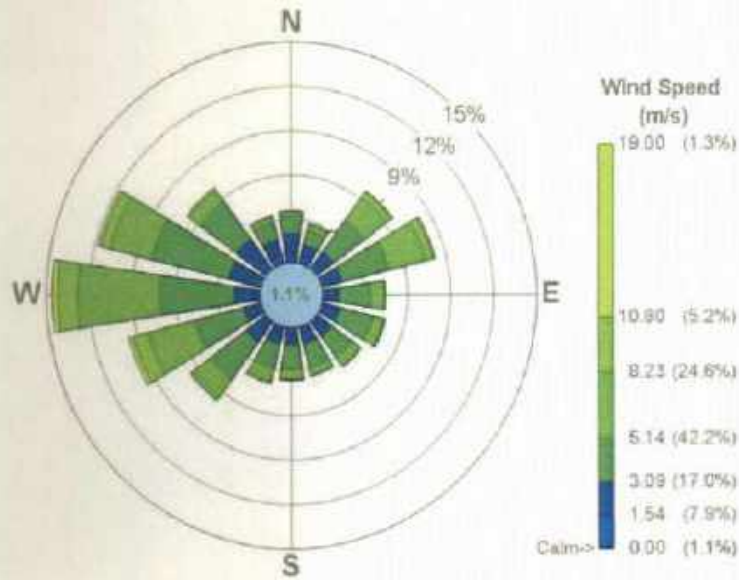
²Relevant habitat not listed by Air Pollution Information Service so assumed habitat to comprise of calcareous grassland

³Relevant habitat not listed by Air Pollution Information Service so assumed habitat to comprise of shingle, rocks and cliffs

5.18. Meteorological Data - Five years (2003 to 2007) of hourly sequential meteorological data as measured at the Met Office's Rhoose monitoring station were employed in the dispersion model. The Rhoose monitoring station (station latitude: 51.4 N; station longitude: -3.343 W; station height: 65 m), which is approximately 7 km west of the proposed biomass plant, is the most representative monitoring station for which all meteorological parameters required for AERMOD are available.

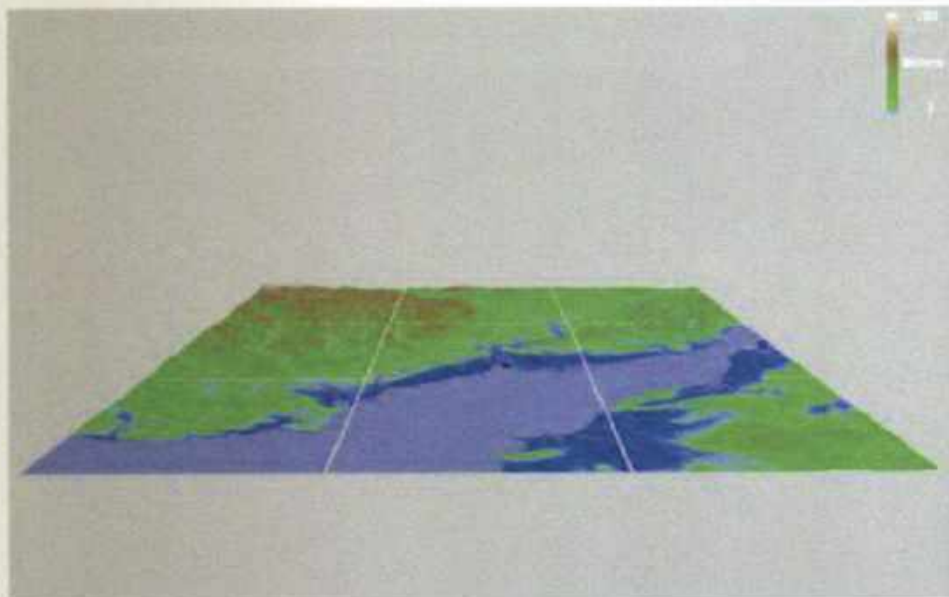
5.19. Figure 5.1 below shows a windrose produced from data as measured at the Rhoose monitoring station between 2000 and 2007. The predominant wind direction is westerly.

Figure 5.1: Windrose Derived from Rhoose Measurement Data (2000 to 2007)



5.20. Terrain - Terrain data have been included in the model to account for topographical features such as hills, which can have a significant effect on the dispersion of pollutants. Elevated position of residential properties on Dock View Road have hence been taken into account.

Figure 5.2: Terrain Included In The Dispersion Model



- 5.21. **Surface Characteristics Input to the Dispersion Model** – The most influential surface characteristic on pollutant dispersion is the surface roughness length. A value for surface roughness is applied to the model to characterise the effect of the surrounding terrain on the turbulence of near-surface flows. The albedo is the fraction of total incident solar radiation reflected by the surface back to space without absorption. The daytime Bowen ratio, an indicator of surface moisture, is the ratio of the sensible heat flux to the latent heat flux and is used for determining planetary boundary layer parameters for convective conditions. Table identifies the surface parameters that were included in the dispersion model. These values assigned to the surface parameters take into account coastal effects on the dispersion of pollutants.

Table 5.8 Surface Characteristics Input to the Dispersion Model

Albedo	Bowen Ratio	Surface Roughness
0.2075	1.5	0.4

- 5.22. **Buildings** - In order to capture the potential influence of buildings/structures on the dispersion profile of combustion emissions (i.e. building downwash effects), the main building adjacent to the modelled emission source was included in the assessment. The location and height of the modelled building is presented below in Table .

Table 5.9 Buildings Details

Building	Grid Reference, X	Grid reference, Y	Height, m	Length, m	Width, m	Angle, degrees
Main Building	312584.7	167673.6	14.1	59.4	45.6	54.2

Notes: Grid reference refers to the southwest corner of building.

- 5.23. **Nitrogen and Acid Deposition** - In order to assess the potential impacts of nitrogen and acid deposition at the ecological receptors listed in Table 5.7, nitrogen and acid deposition rates were derived from predicted NO_x and SO₂ concentrations and were compared with prevailing background deposition rates and the upper and lower critical load ranges for key habitats represented at each assessed ecological receptor.

Baseline Conditions

- 5.24. UK Air Quality Archive Data - The UK Air Quality Archive, which is maintained by AEA on behalf of DEFRA (Department for Environment, Food and Rural Affairs) and the devolved administrations, provides predicted background air quality maps that can be used in air quality modelling studies to represent background concentrations of pollutants of concern. The maps combine air quality monitoring data with the output from predictive modelling, which includes emissions from arterial roads and major industries, to provide predicted background pollutant concentrations on a 1 km by 1 km grid basis across the UK.
- 5.25. Predicted/mapped background air quality at the biomass plant site for the base case year of 2008 and the anticipated opening year of 2010 is presented below in Table . Background NO_x, NO₂ and PM₁₀ data for 2008 and 2010 were appropriately adjusted from 2005 base data using the Year Adjustment Calculator (also available at the UK Air Quality Archive). Background CO concentrations for 2008 and 2010 were adjusted from 2001 base data. The background SO₂ concentration for 2008 and 2010 was obtained from 2001 base data. No year conversion factors were available for this parameter.
- 5.26. Background concentrations of pollutants of concern are well below the national air quality standards protective of human health. Furthermore, background concentrations are predicted to fall over time at the proposed site.

Table 5.10 Estimated/Mapped Annual Average Background Pollutant Concentrations ($\mu\text{g} / \text{m}^3$)

Pollutant	2008	2010	Air Quality Objective
Nitrogen Dioxide (NO ₂)	14.7	12.1	40
Nitrogen Oxides (NO _x)	16.6	15.4	30
Carbon Monoxide (CO)	127.8	113.5	10,000
Sulphur Dioxide (SO ₂)	3.6	3.6	20
Particles (PM ₁₀)	15.5	15.3	40

Notes: NO_x air quality objective is set for the protection of vegetation and ecosystems only; presented concentrations are for 1 km by 1 km grid square centred at grid reference: 312500, 167500 (approximate location of centre of the site: 312647, 167668).

5.27. Local Authority Air Quality Review and Assessment - As required by the Environment Act 1995, local authorities are obligated to review and assess air quality with respect to the standards and objectives for the pollutants specified in the Government's National Air Quality Strategy (NAQS). Local authorities are required to carry out an Updating and Screening Assessment (USA) of their area every three years. If the USA identifies potential hotspot areas where air quality objectives are likely to be exceeded, then a detailed assessment of those areas is required. Where objectives are not predicted to be met, local authorities must declare the area as an Air Quality Management Area (AQMA). In addition, local authorities are required to produce an Air Quality Action Plan (AQAP), which includes measures to improve air quality within the AQMA.

5.28. The Vale of Glamorgan Council (VGC), the relevant local authority, has reviewed air quality within its administrative boundary, and has not declared any AQMAs. Passive diffusion tube and automatic air quality monitoring is carried out within the VGC area. The nearest passive and automatic monitoring locations to the proposed biomass power plant site are described below:

- Rurally located automatic monitoring station (Vale of Glamorgan Fonmon) situated approximate 6 km west of the proposed biomass plant in a car park next to the Highwayman Inn, Rhoose. This monitoring station is part of the Welsh Automatic Rural Pollution Monitoring Network; and,
- An intermediate NO₂ diffusion tube site located at St. Teilo Avenue, Barry (approximately 1.5 km north of the proposed biomass plant).

5.29.

5.30.

5.31.

5.32. **Table** below presents 2007 annual average NO_x, NO₂, SO₂ and PM₁₀ data as measured at the two monitoring stations. Relevant air quality objectives were met at both sites in 2007.

Table 5.11 2007 Annual Average Air Quality Monitoring Data from the Vale of Glamorgan Fonmon Automatic Monitoring Station and the St. Teilo Avenue Diffusion Tube Monitoring Site

Monitoring Locations	2007 Annual Average NO _x Concentration (µg/m ³)	2007 Annual Average NO ₂ Concentration (µg/m ³)	2007 Annual Average SO ₂ Concentration (µg/m ³)	2007 Annual Average PM ₁₀ Concentration (µg/m ³)
Vale of Glamorgan Fonmon Automatic Station	16.4	11.9	3.6	19.6
Diffusion Tube at St. Teilo Avenue	No Data	17.0	No Data	No Data
Air Quality Objectives	30	40	20	40

Background Air Quality Data Included in the Assessment

5.33. Table below summarises the background air quality data employed in the dispersion modelling assessment. Estimated (2010) annual average pollutant concentrations are derived from a combination of sources, including the UK Air Quality Archive and the nearest automatic and diffusion tube monitoring stations to the proposed biomass plant. Where appropriate, the data have been adjusted for the future year of 2010 by applying relevant LAQM TG(03) year adjustment factors.

Table 5.12 Estimated 2010 Annual Average Pollutant Concentrations

	NO _x (µg/m ³)	NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)	CO (µg/m ³)	SO ₂ (µg/m ³)
UK Air Quality Archive	15.4	12.1	15.3	113.5	3.6
Vale of Glamorgan Fonmon Automatic Station	14.3	10.9	18.5	-	3.6
St. Teilo NO ₂ Diffusion Tube	19.9 (derived from NO₂ measurement)	15.2	-	-	-

5.34. In this assessment, the 2010 annual average background CO concentration obtained from the UK Air Quality Archive was used. 2010 annual average background PM₁₀ and SO₂ concentrations were derived from the 2007 VGC Fonmon automatic monitoring station data. The 2010 background NO₂ concentration was derived from

the 2007 St. Teilo Avenue diffusion tube data. The 2010 background NO_x concentration employed in the assessment was derived from the 2007 St. Teilo Avenue NO₂ diffusion tube data by multiplying the annual average NO₂ concentration by the NO_x/NO₂ ratio from the VCG Fonmon automatic monitoring station, which is 1.31 (14.3 µg/m³/10.9 µg/m³). No background concentrations of dioxins, HCl, HF and Hg are available, however, background concentrations of these pollutants are considered to be negligible.

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

- 5.35. It is not expected that any impacts would arise from increased traffic emissions from construction traffic; the construction of the proposed development is not expected to result in a large number of vehicle movements.
- 5.36. There is potential for air quality impacts to arise from dust generating construction activities. However, the nearest residential properties are some 300m from the site to the north; the westerly prevailing winds would ensure any impact would be low.

Additional Mitigation Opportunities

- 5.37. Best practice measures to minimize dust generation will be carried out, such as those set out at §§5.42 – 5.48 of this Statement.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

- 5.38. For deriving long-term (annual average) NO₂ concentrations, 70% of the highest predicted annual average NO_x process contribution was assumed to be converted to NO₂, which in turn was added to the background annual average NO₂ concentration. For short-term (99.8th percentile) NO₂ concentrations, 35% of the highest predicted 99.8th percentile of 1 hour-average NO_x process contributions was added to twice the background annual average NO₂ concentration. For short-term CO, PM₁₀ and SO₂, 100% of the process contribution was added to twice the background annual average concentration. Table below presents, for the near-field domain, a sensitivity analysis of the meteorological data employed in the model. The worst-case

meteorological years, based on maximum predicted long- and short-term NO_x process contributions, were identified as 2003 and 2004 respectively.

Table 5.13 Sensitivity Analysis, Near-Field Model Domain (2003 to 2007 meteorological data)

Year	Maximum Annual Average NO _x Process Contribution (µg m ⁻³)	Maximum 99.8 th Percentile of 1-hr Average NO _x Process Contribution (µg m ⁻³)
2003	21.7	243.30
2004	16.62	250.40
2005	13.98	210.80
2006	15.41	234.61
2007	14.37	236.44

5.39. Table 5.14 below presents, for the near-field and far-field model domains, maximum predicted off-site ground level concentrations (including background) of pollutants of concern. All relevant air quality objectives are predicted to be met across both model domains.

5.40. Dispersion profiles of predicted pollutant concentrations are illustrated in the form of contour plots in Appendix 2 of the Air Quality Assessment. The contour plots identify that pollutants generated from the operation of the proposed biomass power plant will disperse rapidly with distance from the site boundary and will reach background concentrations within a few hundred meters.

Table 5.14 AERMOD Predicted Highest Off-Site Ground Level Concentrations (Worst Year Meteorological Data: 2003 for Long-term Impacts and 2004 for Short-term Impacts)

Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration (µg m ⁻³)	Far-field Model Domain Predicted Concentration (µg m ⁻³)	Assessment Criteria/Benchmark (µg m ⁻³)
NO ₂ Background Concentration	Annual Average	15.20	15.20	40
NO ₂ Process Contribution	Annual Average	15.20	15.20	
NO ₂ Predicted Environmental Concentration	Annual Average	30.40	30.40	
NO ₂ Process Contribution	99.8 th percentile of hourly average concentrations	87.63	45.71	200

Nitrogen Dioxide

micrograms per cubic meter

Particulate Matter

Carbon Monoxide

Sulphur Dioxide

Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Far-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criteria/Benchmark ($\mu\text{g m}^{-3}$)
NO ₂ Predicted Environmental Concentration	99.8 th percentile of hourly average concentrations	118.03	76.11	
PM ₁₀ Background Concentration	Annual Average	18.5	18.5	40
PM ₁₀ Process Contribution	Annual Average	1.06	1.06	
PM ₁₀ Predicted Environmental Concentration	Annual Average	19.56	19.56	
PM ₁₀ Process Contribution	90.4 th percentile of 24-hour average concentrations	2.31	2.31	50
PM ₁₀ Predicted Environmental Concentration	90.4 th percentile of 24-hour average concentrations	39.31	39.31	50
CO Background Concentration	Annual Average	113.5	113.5	10000
CO Process Contribution	Max 8-Hour Average	52.27	30.32	
CO Predicted Environmental Concentration	Max 8-Hour Average	279.27	257.32	
SO ₂ Background Concentration	Annual Average	3.6	3.6	-
SO ₂ Process Contribution	99.9 th percentile of 15-min average concentrations	144.77	43.27	266
SO ₂ Predicted Environmental Concentration	99.9 th percentile of 15-min average concentrations	151.97	50.47	
SO ₂ Process Contribution	99.7 th percentile of hourly average concentrations	57.64	31.73	350
SO ₂ Predicted Environmental Concentration	99.7 th percentile of hourly average concentrations	64.84	38.93	350

Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Far-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criteria/Benchmark ($\mu\text{g m}^{-3}$)
SO ₂ Process Contribution	99.2 nd percentile of 24-hour average concentrations	21.61	21.61	125
SO ₂ Predicted Environmental Concentration	99.2 nd percentile of 24-hour average concentrations	28.81	28.81	
HCl Background Concentration	Annual Average	Negligible	Negligible	800
HCl Process Contribution	Annual Average	1.06	1.06	
HCl Predicted Environmental Concentration	Annual Average	1.06	1.06	
HCl Process Contribution	1-hour Average	5.48	0.46	20
HCl Predicted Environmental Concentration	1-hour Average	5.48	0.46	
HF Background Concentration	Annual Average	Negligible	Negligible	-
HF Process Contribution	1-hour Average	0.55	0.05	250
HF Predicted Environmental Concentration	1-hour Average	0.55	0.05	
Hg Background Concentration	Annual Average	Negligible	Negligible	7.5
Hg Process Contribution	Annual Average	0.01	0.01	7.5
Hg Predicted Environmental Concentration	Annual Average	0.01	0.01	
Hg Process Contribution	1-hour Average	0.03	0.002	0.25
Hg Predicted Environmental Concentration	1-hour Average	0.03	0.002	
Dioxins Background Concentration	Annual Average	Negligible	Negligible	-
Dioxins Process Contribution	Annual Average	1.09E ⁻⁸	1.09E ⁻⁸	
Dioxins Predicted Environmental Concentration	Annual Average	1.09E ⁻⁸	1.09E ⁻⁸	
Dioxins Process Contribution	1-hour Average	2.64E ⁻⁷	6.93E ⁻⁸	

Hydrogen Chloride
 Hydrogen Fluoride
 Mercury

Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Far-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criteria/Benchmark ($\mu\text{g m}^{-3}$)
Dioxins Predicted Environmental Concentration	1-hour Average	2.64E ⁻⁷	6.93E ⁻⁸	
Dioxins Process Contribution	24-hour Average	5.52E ⁻⁸	4.89E ⁻⁸	
Dioxins Predicted Environmental Concentration	24-hour Average	5.52E ⁻⁸	4.89E ⁻⁸	

Notes: For long-term impacts, predicted concentration = process contribution + background concentration (with an assumed 70% oxidation of NO_x to NO₂); For short-term impacts, predicted concentration = process contribution + 2 × background concentration (with an assumed 35% oxidation of NO_x to NO₂); Maximum predicted 8-hr average CO concentration is not anticipated to vary significantly from the 8-hr rolling average. As there is no 15-min time series can be set in the model, 15-min 99.9th percentile SO₂ process contribution was derived from 99.9th percentile hourly contribution by multiplying 1.34 as conversion factor suggested by IPPC Horizontal Guidance Note 1.

5.41. Table 5.15 below identifies maximum predicted off-site ground level pollutant concentrations at each of the discrete residential receptor locations included in the model. Pollutant concentrations are predicted to meet relevant air quality objectives.

Table 5.15 AERMOD Predicted Maximum Off-Site Ground Level Concentrations at Discrete Residential Receptor Locations (2003 Meteorological Data for Annual Average and 2004 for Short-term Predictions)

Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
NO _x Process Contribution	Annual Average	0.46	0.41	0.18	0.56	1.26	0.47	0.32	0.07
NO _x Background	-	19.91	19.91	19.91	19.91	19.91	19.91	19.91	19.91
NO _x Predicted Environmental Concentration	Annual Average	20.37	20.32	20.09	20.47	21.17	20.38	20.23	19.98

NO ₂ Process Contribution	Annual Average	0.32	0.29	0.13	0.39	0.88	0.33	0.22	0.05
NO ₂ Background	-	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
NO ₂ Predicted Environmental Concentration	Annual Average	15.52	15.49	15.33	15.59	16.08	15.53	15.42	15.25

NO ₂ Process Contribution	99.8 th percentile of hourly average concentrations	6.21	7.50	4.20	4.15	7.75	3.34	2.03	0.92
NO ₂ Background	Twice the annual average concentration	30.40	30.40	30.40	30.40	30.40	30.40	30.40	30.40
NO ₂ Predicted Environmental Concentration	99.8 th percentile of hourly average concentrations	36.61	37.90	34.60	34.55	38.15	33.74	32.43	31.32

PM ₁₀ Process Contribution	Annual Average	0.02	0.02	0.01	0.03	0.06	0.02	0.02	0.003
PM ₁₀ Background	-	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50

Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
PM ₁₀ Predicted Environmental Concentration	Annual Average	18.52	18.52	18.51	18.53	18.56	18.52	18.52	18.50
PM ₁₀ Process Contribution	90.4 th percentile of 24-hour average concentrations	0.07	0.06	0.03	0.05	0.13	0.08	0.05	0.01
PM ₁₀ Background	Twice Annual Average Concentration	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00
PM ₁₀ Predicted Concentration	90.4 th percentile of 24-hour average concentrations	37.07	37.06	37.03	37.05	37.13	37.08	37.05	37.01
CO Process Contribution	Max 8-Hour Average	2.45	2.35	2.76	2.63	3.62	1.31	0.88	0.39
CO Background	Twice the Annual Average Concentration	227.00	227.00	227.00	227.00	227.00	227.00	227.00	227.00
CO Predicted Concentration	Max 8-Hour Average	229.45	229.35	229.76	229.63	230.62	228.31	227.88	227.39
SO ₂ Process Contribution	Annual Average	0.11	0.10	0.04	0.14	0.31	0.11	0.08	0.02
SO ₂ Background	-	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
SO ₂ Predicted Concentration	Annual Average	3.71	3.70	3.64	3.74	3.91	3.71	3.68	3.62

Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
SO ₂ Process Contribution	99.9 th percentile of 15-min average concentrations	6.91	8.61	5.24	6.82	8.68	4.40	3.42	0.97
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.9 th percentile of 15-min average concentrations	14.11	15.81	12.44	14.02	15.88	11.60	10.62	8.17
SO ₂ Process Contribution	99.7 th percentile of hourly average concentrations	4.19	4.33	1.61	2.72	5.26	1.76	1.06	0.63
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.7 th percentile of hourly average concentrations	11.39	11.53	8.81	9.92	12.46	8.96	8.26	7.83
SO ₂ Process Contribution	99.2 nd percentile of 24-hour average concentrations	0.95	0.81	0.46	0.72	1.82	0.67	0.37	0.17
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.2 nd percentile of 24-hour average	8.15	8.01	7.66	7.92	9.02	7.87	7.57	7.37

Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
	concentrations								
HCl Process Contribution	Annual Average	0.02	0.02	0.01	0.03	0.06	0.02	0.02	0.003
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	Annual Average	0.02	0.02	0.01	0.03	0.06	0.02	0.02	0.003
HCl Process Contribution	1-hour Average	1.87	1.96	1.31	1.74	1.87	0.92	0.69	0.25
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	1-hour Average	1.87	1.96	1.31	1.74	1.87	0.92	0.69	0.25
HF Process Contribution	1-hour Average	0.19	0.20	0.13	0.17	0.19	0.09	0.07	0.02
HF Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HF Predicted Concentration	1-hour Average	0.19	0.20	0.13	0.17	0.19	0.09	0.07	0.02
Hg Process Contribution	Annual Average	0.00011	0.00010	0.00004	0.00014	0.00031	0.00011	0.00008	0.00002
Hg Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Hg Predicted Concentration	Annual Average	0.00011	0.00010	0.00004	0.00014	0.00031	0.00011	0.00008	0.00002
Hg Process Contribution	1-hour Average	0.01	0.01	0.01	0.009	0.009	0.005	0.003	0.001
Hg Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Hg Predicted Concentration	1-hour Average	0.01	0.01	0.01	0.009	0.009	0.005	0.003	0.001

Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
Dioxins Process Contribution	Annual Average	2.30E ⁻¹⁰	2.05E ⁻¹⁰	9.06E ⁻¹¹	2.81E ⁻¹⁰	6.30E ⁻¹⁰	2.34E ⁻¹⁰	1.58E ⁻¹⁰	3.27E ⁻¹¹
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	Annual Average	2.30E ⁻¹⁰	2.05E ⁻¹⁰	9.06E ⁻¹¹	2.81E ⁻¹⁰	6.30E ⁻¹⁰	2.34E ⁻¹⁰	1.58E ⁻¹⁰	3.27E ⁻¹¹
Dioxins Process Contribution	1-hour Average	1.92E ⁻⁰⁸	2.01E ⁻⁰⁸	1.34E ⁻⁰⁸	1.78E ⁻⁰⁸	1.92E ⁻⁰⁸	9.46E ⁻⁰⁹	7.05E ⁻⁰⁹	2.53E ⁻⁰⁹
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	1-hour Average	1.92E ⁻⁰⁸	2.01E ⁻⁰⁸	1.34E ⁻⁰⁸	1.78E ⁻⁰⁸	1.92E ⁻⁰⁸	9.46E ⁻⁰⁹	7.05E ⁻⁰⁹	2.53E ⁻⁰⁹
Dioxins Process Contribution	24-hour Average	2.23E ⁻⁰⁹	2.80E ⁻⁰⁹	1.96E ⁻⁰⁹	1.86E ⁻⁰⁹	3.97E ⁻⁰⁹	1.49E ⁻⁰⁹	8.30E ⁻¹⁰	3.62E ⁻¹⁰
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	24-hour Average	2.23E ⁻⁰⁹	2.80E ⁻⁰⁹	1.96E ⁻⁰⁹	1.86E ⁻⁰⁹	3.97E ⁻⁰⁹	1.49E ⁻⁰⁹	8.30E ⁻¹⁰	3.62E ⁻¹⁰

Notes: Reported annual average NO_x concentration = process contribution + background annual average; For short-term impacts, predicted environmental concentration = process contribution + 2 × background concentration (with an assumed 35% oxidation of NO_x to NO₂); Maximum predicted 8-hr average CO concentration not anticipated to vary significantly from 8-hr rolling average. As no 15-min time series can be set in model, 15-min 99.9th percentile SO₂ process contribution was derived from 99.9th percentile hourly contribution by multiplying 1.34 as conversion factor suggested by IPPC Horizontal Guidance 1.

5.42. Nitrogen Deposition - Nitrogen deposition resulting from the operation of the proposed biomass power plant has been assessed at all ecologically sensitive receptor locations within 10 km of the site. Table below identifies that the maximum predicted process contribution to the background nitrogen deposition rate at all of the sites designated for their ecological importance is less than 0.1% of the relevant background deposition rate. Where exceedence of critical nitrogen deposition load was identified, such exceedences are due to predominant background deposition rates and the highest process contribution at such locations is less than 1% of the lower critical load. The process related impacts on the ecologically sensitive sites are hence not considered to be significant.

Table 5.16 Maximum Predicted Nitrogen Deposition Rate at Ecological Receptors (maximum across all five years of meteorological data)

Receptor		Annual Average Environmental NO _x Concentration (Process + Background)	Dry Nitrogen Deposition Rate from the Process	Current Background Nitrogen Deposition Rate	Total Nitrogen Deposition Rate	Critical Load Range of Nitrogen Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Lower Critical Load
		(µg m ⁻³)	(kg N/ha/yr)	kg N/ha/yr	kg N/ha/yr	kg N/ha/yr	%	%
1	Barry Island	19.989	0.008	12.9	12.908	10 to 15	0.06%	0.08%
2	Cliff Wood - Golden Stairs	19.963	0.005	25.3	25.305	10 to 15	0.02%	0.05%
3	Coedydd Y Barri/Barry Woodlands	19.937	0.003	25.3	25.303	10 to 15	0.01%	0.03%
4	Cog Moors	19.943	0.003	11.8	11.803	10 to 15	0.03%	0.03%
5	Cosmeston Park	19.933	0.002	22.5	22.502	10 to 15	0.01%	0.02%
6	Cwm Cydfin, Leckwith	19.917	0.001	26.2	26.201	10 to 15	0.003%	0.01%
7	East Aberthaw Coast	19.924	0.001	13.3	13.301	10 to 15	0.01%	0.01%
8	Ely Valley	19.916	0.001	-	-	-	-	-
9	Flat Holm	19.924	0.001	10.2	10.201	10 to 15	0.01%	0.01%
10	Hayes Point to Bendrick Rock	20.025	0.012	12.9	12.912	10 to 15	0.09%	0.12%
11	Nant Whitton Woodlands	19.919	0.001	31.2	31.201	10 to 15	0.003%	0.01%

Receptor		Annual Average Environmental NO _x Concentration (Process + Background)	Dry Nitrogen Deposition Rate from the Process	Current Background Nitrogen Deposition Rate	Total Nitrogen Deposition Rate	Critical Load Range of Nitrogen Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Lower Critical Load
		(µg m ⁻³)	(kg N/ha/yr)	kg N/ha/yr	kg N/ha/yr	kg N/ha/yr	%	%
12	Penarth Coast	19.942	0.003	11.8	11.803	10 to 15	0.03%	0.03%
13	Severn Estuary	19.920	0.001	14	14.001	10 to 15	0.01%	0.01%
14	Sully Island	19.954	0.004	11.8	11.804	10 to 15	0.04%	0.04%
15	Severn Estuary	19.931	0.002	11.8	11.802	10 to 15	0.02%	0.02%
16	Severn Estuary	19.931	0.002	11.8	11.802	10 to 15	0.02%	0.02%
17	Severn Estuary - Sully Island	19.954	0.004	11.8	11.804	10 to 15	0.04%	0.04%
Assessment Criteria		30	-	-	-	-	-	1%

Notes: Dry deposition velocity for NO₂ was assumed as 1.5 mm/s and NO₂ wet deposition was assumed as negligible as suggested by the UK Environment Agency for similar assessments. NO₂ wet deposition was assumed as negligible.

5.43. Acid Deposition - Acid deposition resulting from the operation of the proposed biomass power plant has been assessed at all ecologically sensitive receptor locations within 10 km of the site. Table below identifies that the total process contribution to the acid deposition rate at all sites designated for their ecological importance is less than 1% of the relevant background deposition rate and the critical load identified for relevant habitat. Furthermore, the total acid deposition (process + background) was not predicted to exceed the critical load of the assessed ecological receptors. Hence the impacts of the proposed biomass plant are not considered significant.

Table 5.17 Maximum Predicted Acid Deposition Rate at Ecological Receptors (maximum across all five years of meteorological data)

Receptor		Annual Average Process NO ₂ Contribution	Annual Average Process SO ₂ Contribution	Dry NO ₂ Acid Deposition from the Process	Dry SO ₂ Acid Deposition from the Process	Wet SO ₂ Acid Deposition from the Process	Total Acid Deposition from the Process	Current Background Acid Deposition	Total Acid Deposition	Critical Load of Acid Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Critical Load
		(µg m ⁻³)	(µg m ⁻³)	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	%	%
1	Barry Island	0.055	0.019	0.00057	0.0038	0.0011	0.0055	1.39	1.396	4	0.40%	0.14%
2	Cliff Wood - Golden Stairs	0.037	0.013	0.00039	0.0026	0.0008	0.0037	2.08	2.084	8.24	0.18%	0.05%
3	Coedydd Y Barri/Barry Woodlands	0.019	0.007	0.00020	0.0013	0.0004	0.0019	2.08	2.082	2.42	0.09%	0.08%
4	Cog Moors	0.023	0.008	0.00024	0.0016	0.0005	0.0023	1.07	1.072	1.5	0.22%	0.15%
5	Cosmeston Park	0.016	0.006	0.00017	0.0011	0.0003	0.0016	1.07	1.072	4	0.15%	0.04%
6	Cwm Cydfin, Leckwith	0.005	0.002	0.00005	0.0003	0.0001	0.0005	2.37	2.370	10.3	0.02%	0.004%
7	East Aberthaw Coast	0.010	0.003	0.00010	0.0007	0.0002	0.0010	-	-	-	-	-
8	Ely Valley	0.004	0.002	0.00005	0.0003	0.0001	0.0004	-	-	-	-	-
9	Flat Holm	0.010	0.003	0.00010	0.0007	0.0002	0.0010	-	-	-	-	-
10	Hayes Point to Bendrick Rock	0.081	0.028	0.00084	0.0056	0.0017	0.0081	-	-	-	-	-
11	Nant Whitton Woodlands	0.006	0.002	0.00007	0.0004	0.0001	0.0006	2.47	2.471	2.48	0.03%	0.03%
12	Penarth Coast	0.022	0.008	0.00023	0.0016	0.0005	0.0022	-	-	-	-	-
13	Severn Estuary	0.007	0.002	0.00007	0.0005	0.0001	0.0007	-	-	-	-	-

Receptor		Annual Average Process NO ₂ Contribution	Annual Average Process SO ₂ Contribution	Dry NO ₂ Acid Deposition from the Process	Dry SO ₂ Acid Deposition from the Process	Wet SO ₂ Acid Deposition from the Process	Total Acid Deposition from the Process	Current Background Acid Deposition	Total Acid Deposition	Critical Load of Acid Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Critical Load
		(µg m ⁻³)	(µg m ⁻³)	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	%	%
1 4	Sully Island	0.031	0.011	0.00032	0.0022	0.0006	0.0031	-	-	-	-	-
1 5	Severn Estuary	0.015	0.005	0.00015	0.0010	0.0003	0.0015	1.07	1.071	1.5	0.14%	0.10%
1 6	Severn Estuary	0.015	0.005	0.00015	0.0010	0.0003	0.0015	-	-	-	-	-
1 7	Severn Estuary - Sully Island	0.031	0.011	0.00032	0.0022	0.0006	0.0031	-	-	-	-	-

Note: NO₂ wet deposition was assumed as negligible

Additional Mitigation Opportunities

- 5.44. Site operations will be carried out to minimise the creation of dust. A permanent constant mains water supply will be available on site in all climatic conditions to ensure that the dust suppression systems can function effectively and all external water pipes are lagged to prevent frost damage during Winter months. Dust in the hopper and conveyor area will be controlled using a hand held water hose or vacuum extraction system.
- 5.45. The site staff will continuously monitor dust emissions whilst the plant is in operation and take appropriate action when required. In addition the site supervisor will visually monitor for dust emissions at the site perimeter at least twice daily to ensure that no dust blows off the site. Results of monitoring exercises will be entered into the site diary.
- 5.46. Water sprays and/or bowsers will be used to reduce dust levels on all external site surfaces where necessary. This particularly applies to site roads, storage, loading and unloading areas. Vehicles carrying potentially dusty loads off site will be securely sheeted or sprayed with water to reduce dust emissions.
- 5.47. Stockpiles will be located within the proposed building to ensure that vehicles leaving the site cannot track through the stored material to prevent deposit of debris on the highway. The deposit of material on the highway will be treated as an emergency and will be cleaned with a road sweeper if necessary.
- 5.48. Mud/litter on roads - The deposit of material onto the access road and highway is unlikely, however if it does occur during the construction phase, for example, it will be cleared using a road sweeper or hand picked in the case of litter.
- 5.49. Visual inspections of the site surface will be carried out daily and staff will report any problems with debris on the site surface immediately to the site supervisor. Vehicles will be visually inspected before exit to check that loads are safe and that no debris is carried out on the wheels or body of the vehicle.

- 5.50. Odour - No material will be accepted which is likely to cause an odour nuisance. Any loads which are malodorous will be rejected and the Environment Agency informed. The Biomass plant itself does not produce odorous emissions.

Cumulative Effects

Introduction

- 5.51. This section describes the potential cumulative effects which could arise from the interaction of the proposed facility and other developments in the study area. A planning application (no. 2009/00021/FUL) submitted by Biogen for a gasification facility was approved on 17 September 2009. Cumulative Impact Assessments have been undertaken by RSK Group plc with regard Air Quality and AB Acoustics with regard Noise.

Air Quality

- 5.52. In-combination impacts on air quality when both the proposed biomass plant and the aforementioned gasification facility are in operation have been predicted using AERMOD dispersion model. Emission parameters pertaining to the proposed Biogen gasification facility have been obtained from the air dispersion modelling report prepared by Parsons Brinckerhoff (Report Reference No: FSE97027C, dated September 2008).
- 5.53. Emission Parameters Used in the Cumulative Impact Assessment - The physical and emission parameters of the sources included in the cumulative impact assessment are identified in Table 12.1.

Table 12.1 Emission Parameters for Gasification Facility Included in the Dispersion Model

Emission Source	Proposed Gasification Plant (Biogen Plant)	Proposed Biomass Plant (Sunrise Renewables Plant)
Source Location (Easting, Northing)	312775, 167195	312647, 167668
Stack Height, m (from ground level)	45	20
Stack Diameter, m	1.04	0.9
Efflux Temperature, deg K	403	598

Efflux Velocity, m/s	13.03	14
Pollutant Emission Rates, g/s		
NO _x	3.69	0.8132
PM ₁₀	0.1845	0.0407
SO ₂	0.9225	0.2033
CO	0.9225	0.2033
HCl	0.1845	0.0407
HF	0.01845	0.0041
Hg	0.0009225	0.0002
Dioxins and Furans	1.845 x 10 ⁻⁸	4.07 x 10 ⁻¹⁰
Group 1 Metals	0.001025	0.002033
Cadmium & Thallium	0.00046125	0.000203
Total Organic carbon	0.1845	0.04066

- 5.54. Discrete Receptors - Table 12.2 identifies the sensitive receptors included in the cumulative impact assessment in addition to the sensitive receptors identified previously.

Table 12.2 Additional Sensitive Receptors Included in the Cumulative Impact Assessment

Receptor	Grid Reference	
	X-coordinate	Y-coordinate
Hayes Lane	313724	167300
Hayes Point Hospital	314004	167398
Bendrick Road	313410	167478
Hayes Road	313638	167674
Southleigh home	314905	168078
Dock View Road	312397	167944
Dyfrig Street	312109	166908
Children's hospice	314331	167685
Bendrick Rock	313076	167166
Barry Island	312226	166870

- 5.55. Building Downwash Effects - Table 12.3 identifies the details of the main building included in the cumulative impact assessment (in addition to that identified previously) to account for the building downwash effects on the dispersion of emissions from the proposed Biogen gasification facility.

Table 12.3 Buildings Details

Grid Reference, X	Grid reference, Y	Height, m	Length, m	Width, m	Angle, degrees
312755	167215	20	53	79	38

Notes: Grid reference refers to the southwest corner of the building.

Assessment Results

- 5.56. The cumulative impact assessment outcomes along with additional contour plots are included in Appendix 3 of the Air Quality Assessment.
- 5.57. The highest predicted off-site ground level concentrations (including background concentrations) of pollutants when both the proposed biomass plant and Biogen gasification facility are in simultaneous operation are predicted to meet the air quality objectives. The highest off-site predicted pollutant ground level concentrations are summarised in Table A3-1 of the Air Quality Assessment.
- 5.58. Table A3-2 and Table A3-3 in Appendix 3 of the Air Quality Assessment identify the highest predicted off-site ground level pollutant concentrations at each discrete receptor locations included in the assessment. Pollutant concentrations are predicted to meet the relevant air quality objectives at all sensitive receptor locations.
- 5.59. Table A3-4 of the Air Quality Assessment identifies the maximum predicted process contribution from both proposed facilities towards nitrogen deposition at the sites of ecological importance. The process contribution has been predicted to be less than 1% of the background nitrogen deposition rate. Where exceedence of critical nitrogen deposition load was identified, such exceedences are due to predominant background deposition rates and the highest process contribution at such locations is less than 1% of the lower critical load. The process related impacts on the ecologically sensitive sites are hence not considered to be significant.
- 5.60. Table A3-5 of the Air Quality Assessment identifies that the process contribution to the acid deposition at the sites designated for their ecological importance is less than 3% of background and less than 1% of the critical load identified for relevant habitat. Furthermore, the total acid deposition (process contribution + background acid deposition rate) was not predicted to exceed the critical load at the assessed ecological receptors. Hence the cumulative impacts of the proposed biomass plant are not considered significant.

5.61. The contour plots identify that pollutants generated from the operation of both the facilities will disperse rapidly with distance from the emission sources and will reach background concentrations within a few hundred metres.

Conclusion

5.62. Cumulative air quality impacts resulting from operation of the proposed biomass plant along with the nearby gasification facility have also been assessed using AERMOD. Though the in-combination impacts are marginally higher than that predicted with independent operation of the proposed biomass plant, no exceedence of air quality objectives was predicted.

Impact Summary Table

Environmental Topic		Description of Impact		Description of mitigation measures	Description of residual impact	
		Description in words	Significance		Description in words	Significance
Air Quality	Construction Impact	Dust and vehicle exhaust emissions	Minor	Vehicle maintenance, dust damping and sweeping	No long term effects	Negligible
	Operational Impact	Process and vehicle emissions,	Moderate	Stack height and emissions treatment and filtering	No residual effects	Negligible

6. ASSESSMENT: ECOLOGY – ALTHAEA HIRSUTA (ROUGH MARSH-MALLOW)

Introduction

- 6.1. This section details a survey of a land-parcel at Barry Docks (OS Grid Reference ST 126 676) to assess its suitability for a legally protected plant species, *viz.* *Althaea hirsuta* (Rough Marsh-mallow), which has been recorded in the ten-kilometre grid-square. No other ecological matters require addressing as there are no other sites with sensitive flora or fauna having a statutory or local nature conservation designation within 500m of the appeal site. The nearest designated site is the SSSI named "Hayes Point to Bendrick Rock" at a distance of 616m from the site. The Local Authority was content with this approach for the planning application.
- 6.2. This section therefore provides background information on the *Althaea* species (hereafter generally referred to as *Althaea*), describes the site and its vegetation, and evaluates the likelihood of *Althaea* being present. The survey was commissioned by Sunrise Renewable Ltd and carried out by a botanist from RSK Carter Ecological Ltd on 12th January 2009.
- 6.3. *Althaea hirsuta* (Rough Marsh-mallow) is listed on *Schedule 8* of the *Wildlife and Countryside Act 1981* giving it legal protection in England and Wales against intentional picking, uprooting and destruction. It was listed as 'Endangered' in Wiggington (1999), but it is not listed as threatened in the most recent IUCN Red List (Cheffings & Farrell 2005).
- 6.4. *Althaea* is an annual, or rarely biennial, herb with erect to decumbent stems up to 60 cm; it is coarsely hairy (hispid) and has shallowly lobed (palmate) lower leaves, and deeply divided upper leaves, all with 3-5 lobes (Stace 1997). The flowers are lilac in colour and have five petals 12 to 16 mm in length. In general appearance, it resembles other British species of the Malvaceae such as *Malva moschata* (Musk Mallow).
- 6.5. *Althaea* behaves mainly as a winter annual in Britain (rarely as a summer annual in wet seasons), flowering from May to early July and setting seed in July and August

(Wigginton 1999). It is a poor competitor and requires bare soil for germination and seedling establishment. If conditions are right, germination may follow shortly after seed-set so that identifiable plants are likely to be in evidence by January.

- 6.6. *Althaea* is considered by many to be an introduced species in Britain, e.g. Stace (1997), Pearman *et al* (2002). However, in Oxfordshire, Somerset and especially in Kent (where it has been known since 1792) it occurs in open, semi-natural vegetation on dry calcareous soils (especially on south-facing slopes), which suggests that it may be native there. From Wigginton (1999) it seems that it usually occurs with at least some distinctly calcicolous associates, either grassland plants or arable weeds, and not with species typical of strongly ruderal or brown-field sites. However, this author does not really discuss the more casual occurrences of *Althaea*.
- 6.7. It also occurs as a casual on waste ground, and as such has been recorded from scattered localities, mostly in southern England and Wales. The most recent county Flora for Glamorgan (Wade *et al* 1994) listed no recent records, but it has since been recorded from the 10 km square covering Barry Docks (Pearman *et al* 2002).

Assessment Methodology

- 6.8. Prior to the site visit, a brief desk-based data-search of published sources was carried out to obtain information on *Althaea hirsuta* (Rough Marsh-mallow).
- 6.9. The site was thoroughly searched for evidence of *Althaea* and the habitat and vegetation types were described. Vascular plant species were listed (*Appendix A of the Survey for Althaea hirsuta*). Subjective estimates of their relative abundance were added using a modified DAFOR scale, which ranks species according to their relative abundance in a given parcel of land as follows: d – dominant, a – abundant, f – frequent, o – occasional, r – rare. In addition, the following prefixes are used: l – locally, v – very. The terms ‘abundant’ and ‘rare’ are used by convention, and apply only to relative-abundance within the recorded area. It does not mean that species are ‘rare’ in the general sense.
- 6.10. January is a poor time of year for most botanical recording purposes. Some species are minimally in evidence as leaves only, and some can be identified from the previous

year's dead remains. But - leaving aside trees, shrubs and large winter-green perennials - many species are not in evidence at all, and whether leaves and dead remains adequate for identification are to be found at a given location is for many species a matter of serendipity. Where these signs are to be found, the presence of a species can often be confirmed, but absence is generally impossible to prove. In January 2009 all this was to some extent exacerbated by cold and frosty weather in the preceding six weeks (as it hastens deterioration of remains and delays development of leaves).

- 6.11. This means that the species list (*Appendix A of the Survey for Althaea hirsuta*) cannot be regarded as exhaustive; many more species would be found in a summer survey. It does, however, adequately indicate the character of the vegetation. The *Althaea* itself normally behaves as a summer- or autumn-germinating winter-annual, and it is therefore reasonable to expect that leaves would be in evidence in mid-winter. A January survey cannot absolutely prove absence of the *Althaea*, but the likelihood is that if it were present then it could in fact be found.

Baseline Conditions

- 6.12. No evidence of *Althaea hirsuta* (Rough Marsh-mallow) was recorded. Species recorded from the site are listed in *Table 1 in Appendix A of the Survey for Althaea hirsuta*.
- 6.13. The site largely comprises bare soil or concrete without vegetation. Much of the ground is heavily rutted by vehicles and there is an abundance of fly-tipped rubbish throughout (*Plate 1 in Appendix B of the Survey for Althaea hirsuta*). Vegetation is confined to scattered, semi-ruderal scrub and grassland along the boundary fences, in the north-east corner, and more particularly at the southern end of the site.
- 6.14. The scattered scrub along the boundary fences mainly consists of *Buddleja davidii* (Butterfly-bush), although there are smaller amounts of *Rosa* species (a Rose) and *Rubus fruticosus* agg. (Bramble). There are small patches of rough grassland with a more or less closed sward alongside scrub in the north-eastern corner of the site and on the verge of David Davies Road. These are dominated by coarse grasses such as *Elytrigia repens* (Common Couch) and also feature the tall umbellifer *Pastinaca sativa* (Wild Parsnip).

- 6.15. The only substantial area of vegetation is at the southern end of the site, where it consists of open, semi-ruderal grassland colonising a substrate of spoil, gravel and concrete (Plate 2 in Appendix B of the Survey for *Althaea hirsuta*). The sparse sward includes the grasses *Agrostis stolonifera* (Creeping Bent) and *Festuca rubra* (Red Fescue) together with a range of herbs typical of disturbed sites such as *Daucus carota* (Wild Carrot), *Medicago lupulina* (Black Medick), *Senecio erucifolius* (Hoary Ragwort) and *Tripleurospermum inodorum* (Scentless Mayweed). Tall ruderals and garden escapes are also frequent, especially on piles of spoil, and include *Conyza* species (a Fleabane), *Hirschfeldia incana* (Hoary Mustard) and a species of *Salvia* or *Teucrium*.
- 6.16. The strongly ruderal character of this site makes it an unlikely place for *Althaea hirsuta* (Rough Marsh-mallow). If it were present then it could only be so as a passing casual. It is generally accepted that little nature conservation value attaches to such casual occurrences of rare species in atypically ruderal sites (as compared to that attaching to them in semi-natural sites). However, to the best of our understanding, that does not derogate from the legal protection attaching to *Althaea*, which would be just as protected as a casual in this site as it would be as a permanent denizen in a semi-natural site, except in so far as mitigation for development, e.g. transplantation, might be much easier to agree with planning authorities and Countryside Council for Wales.
- 6.17. The species list for the site is typical for a disturbed, more-or-less eutrophic, and neutral to perhaps marginally calcareous ruderal site. Though the substrates contain some calcareous materials, e.g. concrete, mortar from building rubble, this is not very distinctly reflected in the species list, there being no strong calcicoles except for the woody climber *Clematis vitalba* (Traveller's Joy). Species such as *Centranthus ruber* (Red Valerian), *Daucus carota* ssp. *carota* (Wild Carrot), *Foeniculum vulgare* (Fennel), *Fragaria vesca* (Wild Strawberry) and *Pastinaca sativa* (Wild Parsnip) are suggestive of very mildly calcicolous tendencies in the flora, but the great majority of the species listed are widespread on normal ruderal sites across lowland Britain. For vegetation suitable for *Althaea* the species list is not encouraging, but neither is it prohibitive; the species named above could just be congeners of *Althaea*.

- 6.18. The greater part of the site has been so disturbed by vehicles (or by some other previous use) that it supports no vegetation at all, while the rather limited areas of scrub and rough grassland can be discounted as potential habitat for *Althaea* because it would not persist amongst the closed vegetation.
- 6.19. By contrast, the area at the southern end of the site appears to provide ideal conditions for the germination and establishment of *Althaea*. The vegetation is open and the substrate is free-draining, relatively infertile and perhaps mildly calcareous. Furthermore, similar early-successional grassland not surveyed in surrounding sites could perhaps support *Althaea*, and in that case might act as a seed-source for *Althaea*.
- 6.20. *Althaea* mainly behaves as a winter annual, and on the balance of probabilities it ought to be in evidence in January, though spring germination (and thence summer annual behaviour) is not unknown in Britain. No *Althaea* or superficially similar species of the Malvaceae were recorded in this survey. Because of the limited area of suitable habitat, it is very unlikely that even poorly-developed specimens would have been missed if they were present.
- 6.21. For the reasons explained above, the absence of *Althaea* cannot absolutely be ruled out from a January survey, and it is always possible that there might be dormant seeds that could germinate in the future. But the failure to find *Althaea* or similar malvaceous species, considered together with the strongly ruderal character of the site and the lack of previous records, make it very unlikely that *Althaea hirsuta* (Rough Marsh-mallow) is present.

Assessment of Effects and Significance: Construction and Operational Phases

- 6.22. Due it being very unlikely that *Althaea hirsuta* (Rough Marsh-mallow) is present, there is very little likelihood of the appeal proposals having any impact at all. As such, there is no requirement for further discussion of the topic.

Impact Summary Table

Environmental Topic		Description of Impact		Description of mitigation measures	Description of residual impact	
		Description in words	Significance		Description in words	Significance
Ecology	Construction Impact	None	Negligible	N/A	None	Negligible
	Operational Impact	Airborne emissions	Minor	Stack height and emissions treatment and filtering	No residual effects	Negligible

7. ASSESSMENT: GROUND CONDITIONS

Introduction

- 7.1. The potential for contaminated land has been examined through a number of sources and pathways. Impacts on any potential receptors are also considered. An outline conceptual model and risk classification is provided.

Assessment Methodology

- 7.2. A preliminary risk assessment was undertaken by RSK Group plc combining the findings of a site walkover and the Environmental Data Report, Geology and Ground Stability Report and Historical Maps compiled by Groundsure.

Baseline Conditions

Geology, Hydrogeology and Hydrology

- 7.3. The site is reported (in the Groundsure Report) to be underlain by made ground overlying Tidal Flat Deposits (clay, silt and sand) underlain by Mercia Mudstone. The Mercia Mudstone Formation is classed as a non-aquifer with the overlying soils (tidal flat deposits) reported as being a minor aquifer and as having low permeability. Borehole records from the British Geological Survey (BGS), drilled on the opposite bank of the docks, report made ground to a depth of 12.9mbgl beneath which mudstone was encountered. Several coal tips are indicated 50m to the south east, however the site is not reported to lie within 1000m of a known area of mining activity. A geological fault is reported 190m to the south east.
- 7.4. The Health Protection Agency information contained within the Groundsure Report indicates that less than 1% of properties in the area are above the radon action level and the Building Research Establishment states that no radon protective measures are necessary for the site.
- 7.5. The site is not situated within 500m of a groundwater source protection zone (SPZ). There are no licensed groundwater abstractions within 1km of the site and the closest surface water abstraction is for mineral washing and is located approximately 650m to

the south east. The nearest surface watercourse is understood to be the dock, located approximately 40m south east of site. Information from the Environment Agency indicates that the southern site boundary is just located within a zone 2 floodplain, estimating the annual probability of flooding due to rivers and the sea to be 0.1- 1.0% for rivers and 0.1-0.5% for the sea. The site also lies within 50m of areas susceptible to groundwater flooding.

Site Environmental Sensitivity

- 7.6. The site is located within a predominantly industrial dockland area, with the nearest residential properties located approximately 300m to the north west. The site is reportedly underlain by made ground over Tidal Flat Deposits (clay, silt and sand), overlying Mercia Mudstone. The Mercia Mudstone Formation is classified as a non-aquifer and the Tidal Deposits are reported to have low permeability. The nearest surface water body is located approximately 40m south east of the site. There are no designated ecological receptors such as Sites of Special Scientific Interest within 500m of the site. On the basis of the above information, the environmental sensitivity of the site is considered to be low.

Site History Review

- 7.7. A review of the site history has been carried out through the study of available Ordnance Survey (OS) maps dating from the late 1800s. The review is designed to identify potential historic sources of contamination that may have impacted soil or groundwater quality beneath the site and to identify any potentially contaminative land uses in the area that may have affected the site.
- 7.8. On site – In 1878 the site is shown to lie within an area of tidal mud flats, with the Cadoxton River shown to cross the centre of the site from east to west. By 1898-1900 the site forms part of an area of reclaimed land, created for the construction of the docks and is shown to include several railway lines for access to the docks (labelling on later maps indicate that these are likely to be for the transport of coal). From 1915 to 1955 various unmarked buildings, located between the railway lines in the south part of site, later identified as engineering works in 1971. By 1982 the railway sidings are no

longer shown on site and by 1989 a builders yard occupies the buildings of the former engineering works. From 2002 until the most recent map of 2007 no buildings are indicated in the south of the site but three unmarked structures are shown on the northern site boundary.

- 7.9. Surrounding Area – The map of 1878 shows the site to be surrounded by tidal mud flats, beyond which is agricultural and moorland to the north, east and west and large areas of exposed rock to the south. By 1898-1900 the site is surrounded by railway sidings to the east and west, with the main trunk line and station approximately 200m to the north west. A dock and associated coal tips are indicated ~40m to the south east, a graving/dry dock is shown ~200m to the west and the nearest residential properties are located ~300m to the north west. The map of 1915 indicates a fresh water reservoir ~800m to the east. The surrounding area remained greatly unchanged until the map of 1971. From 1971 until the most recent map of 2007 various buildings are shown ~30m to the south west of the site, uses including warehouses, engineering works and vehicle repair. From 1971 until 2002 a timber yard was shown directly to the north east, however the yard and associated building were absent in the map of 2007.

Summary of Environmental Database Information

- 7.10. Pollution Incidents – Two entries on the national incidents recording system (NIRS) List 2 pollution incidents are reported within the Groundsure report at a distance of ~110m to the south west. Both incidents are indicated to have caused no impact to land and air and only minor impact to water. The nearest licensed discharge consent is approximately 50m south east of site and the effluent is unspecified.
- 7.11. Landfill Sites – Three historic landfills lie within 500m of the site, the closest is reported to have accepted industrial and household waste and is located ~180m to the south west in the area of the old dry dock. The other landfills are located ~330m to the south east and 500m to the south. Other Environment Agency registered waste sites are located 300 and 330m south west, 470m east of site. The nearest operational landfill site is located approximately 900m to the north east.

- 7.12. Potentially Contaminative Industrial Sites – Due to the industrial nature of the surrounding land use, the Groundsure report lists 56 potentially contaminative industrial sites within 500m of the site. The nearest of these are several vehicle servicing and repair workshops ~60m to the south west. Other nearby land uses listed are located to the north east of site and include an electricity substation (~100m), engineering works (~110-150m) and transport and haulage depots (~170-190m). However it is worth noting that during the site walkover it was observed that a building ~15m to the west was being used as a vehicle repair workshop.

Site Walkover

- 7.13. A site walkover was undertaken on 29 July 2008. The area of the site in the south and east was vacant, with open access, while the area in the north and west housed numerous storage containers and could not be accessed safely at the time of the site walkover. Photographs from the site walkover are presented at the end of this report.
- 7.14. Generally the site was level comprising a surface of rolled gravel with occasional low-lying vegetation. Banked hedgerow forms the south western and north eastern site boundaries and the perimeters to north east and north west of former builder's yard. Concrete foundations were noted in the south west corner in the location of the former builders yard. Items of waste including wood, metal, upholstery, paint cans and a gas canister were observed across the site.
- 7.15. Where visible, the contents of the storage containers comprised scrap metal (possibly vehicle parts), cardboard, wood and upholstery and a car and a fuel storage tank were observed on top of two of the containers. The presence of the scrapped car and observations made of the visible containers suggests that the site and the numerous containers may have been used for vehicle storage. From the perimeter of the site it was observed that the locked yard in the north housed numerous containers, wooden sheds and a double height corrugated metal structure.
- 7.16. Surrounding land uses included a coach service and repair yard directly to the north and east and an antiques storage warehouse and vehicle workshop to the south and west.

More storage containers and scrap metal were observed on the land directly to the north west of site

Assessment of Effects and Significance: Construction Phase and Operational Phase

Predicted Impacts

7.17. Listed below are the potential contamination sources, pathways and receptors:

Sources

- Made ground/fill materials that were used for land reclamation and in the levelling of site after removal of railways;
- Possible asbestos-containing materials (ACMs) in the existing building fabric;
- Ground gases from nearby coal tips (if they extend below ground) and from made ground used in the reclamation works;
- Hydrocarbon impact (petrol/diesel/oils/solvents) and heavy metals associated with the sites possible use for vehicle repair/storage and use as engineering works
- Hydrocarbon (fuel and lubricating oils), ash, coal, sulphate and herbicide impact associated with sites former use as railway sidings;
- Ground gases and leachate from historic and current landfill sites;
- Organic and/or inorganic impact associated with treatment processes at adjacent historic timber yard and potentially at builders yard; and
- Hydrocarbon impact (petrol/diesel/oils/solvents) associated with adjacent coach and vehicle repair workshops.

Pathways

- Surface water run-off and/or infiltration;
- Groundwater migration into and within underlying Tidal Flat Deposits;
- Dermal contact, ingestion, dust and vapour inhalation;
- Ground gas migration in permeable soils or existing/proposed service runs;
- Root uptake; and
- Permeation of plastic utilities or attack of building infrastructure by aggressive ground conditions.

Receptors

- Shallow groundwater in the Tidal Flat Deposits or made ground;
- Surface watercourse (docks) 40m south east of the site;
- Construction workers during redevelopment works;
- Future site workers and visitors;
- Neighbouring residents 300m north west of site and adjacent workers;
- Vegetation;
- Building foundation materials and
- Infrastructure.

7.18. A linkage between the site and any neighbouring residents is considered incomplete due to the distance to the nearest residential property being in the region of 300m. Groundwater beneath the site is assumed to flow in a south westerly direction towards the entrance of the dock and hence only the neighbouring site to the north and east was considered in the preliminary risk assessment for vapour inhalation pathways to onsite receptors.

7.19. Once the redevelopment works are completed a linkage with respect to direct contact to adjacent workers is also considered incomplete owing to the hardstanding and vegetation that will limit dust generation. During redevelopment works, risks associated with dust migration can be mitigated by damping exposed soil during partially dry conditions.

Table 7.1: Outline Conceptual Model and Risk Classification

Potential Source	Potential Receptor	Possible Pathway	Likelihood	Severity	Risk Class
Contamination associated with the sites former use for coal transport, vehicle repair/storage, fill materials used for land reclamation and in the levelling of site after removal of railways, builders yard and engineering works	Shallow groundwater in the Tidal Flat Deposits and made ground and surface watercourses	Leaching through unsaturated zone and lateral migration	Likely	Mild	Moderate/Low
	Construction workers	Soil ingestion, dust inhalation & dermal contact	Likely	Minor	Low ⁽¹⁾
	Future site workers and visitors	Soil ingestion, dust inhalation & dermal contact	Unlikely	Medium	Low
	Vegetation	Root uptake	Unlikely	Minor	Very low
ACMs in current building fabric	Building Infrastructure	Direct contact with building foundations	Likely	Mild	Moderate/Low
	Construction workers	Dust inhalation	Low	Medium	Moderate/Low ⁽¹⁾
	Ground gases from on-site made ground, nearby coal tips and current and historic landfills	Inhalation and gas ingress into buildings and inhalation	Likely	Medium	Moderate
Hydrocarbon impact (petrol/diesel/engine oil and solvents) associated with adjacent coach repair yard and historic and timber yard	Future site workers and visitors	Root uptake	Low	Minor	Very low
	Construction workers	Direct contact including ingestion, dermal contact and/or inhalation of dust	Low	Medium	Moderate/Low
	Future site workers and visitors	Inhalation of dust	Unlikely	Minor	Very low ⁽¹⁾
Hydrocarbon impact (petrol/diesel/engine oil and solvents) associated with adjacent coach repair yard and historic and timber yard	Future site workers and visitors	Inhalation of vapours	Low	Medium	Moderate/Low
	Construction workers	Inhalation of dust	Unlikely	Minor	Very low ⁽¹⁾

(1) The risk classification regarding hydrocarbon exposure to site construction workers was made with the understanding that appropriate levels of hygiene are maintained and personal protective equipment is worn at all times.

7.20. The outline Conceptual Model has identified the following potential pollutant linkages with a Risk Class of Moderate/Low or higher:

- Impact to building infrastructure, i.e. permeation of plastic water supply pipes or damage to foundations due to aggressive ground conditions;

- Impact to shallow groundwater from onsite fill materials and contaminants due to previous land uses;
- Dust inhalation of ACMs by construction workers;
- Inhalation of ground gases from onsite made ground (and potentially from nearby coal tips and landfill sites) by construction workers and future site workers and visitors; and
- Inhalation of hydrocarbon/solvent vapours originating from the adjacent coach repair and historic timber yard by construction workers and future site workers and visitors.

7.21. The PRA undertaken by RSK has identified a number of potential pollutant linkages associated with the site. The presence or otherwise of asbestos-containing materials (ACMs) within the existing building fabric should be determined (if not already done so) and any ACMs removed by a licensed asbestos contractor before the demolition of the buildings on site.

7.22. In order to determine the nature, extent and source of any on-site contaminants relating to previous land workings/uses and to identify any migration of contaminants from off-site sources, it is recommended that an intrusive geo-environmental survey be carried out. The survey should be designed to include sampling of ground gas, soil and groundwater. Boreholes should be installed to determine the groundwater level/flow direction and to provide geotechnical information for effective foundation design.

7.23. The investigation would also need to prove the thickness of made ground and competency of underlying deposits, particularly given the centre of the site overlies the former route of the River Cadoxton. These factors are likely to impact upon foundation solutions for the Biomass power plant.

Impact Summary Table

Environmental Topic		Description of Impact		Description of mitigation measures	Description of residual impact	
		Description in words	Significance		Description in words	Significance
Ground Conditions	Construction Impact	Contamination exposure of construction workers	Moderate	Capping, disposal or treatment of contaminants following further surveys	No long term significance	Moderate
	Operational Impact	None	Negligible	Site will have been treated to break contaminative linkages	Removal of existing contaminants	Moderate positive

8. ASSESSMENT: LANDSCAPE

Introduction

- 8.1. The Appleton Group has undertaken a Landscape and Visual Impact Assessment since the refusal of the planning application. VOGC considered that the proposed development would have an adverse impact on the character of adjacent residential areas and on the Barry Waterfront Development which is to the west of the appeal site.

Assessment Methodology

- 8.2. The assessment has been prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment prepared jointly with IEMA and The Landscape Institute.(2002). The site was visited and an assessment was made of baseline conditions in terms of the landscape quality and character of the site and its surroundings. Potential view points were established and photographs were taken. A desk top review of National and Local Planning policies related to landscape issues was undertaken. An assessment of the potential impact of the development was made of both the construction and operational phases, covering landscape effects, visual impact and landscape character.
- 8.3. Landscape effects or impacts are those which as the result of the development might alter the vegetation structure, topography, land use or soils. Visual impacts are those perceived by human receptors as the result in a change of appearance of land as the result of development Impacts on character refer to the external visual influence of the development on adjacent landscape and land use.
- 8.4. Proposals for mitigation were made and any residual impacts assessed. The criteria used for evaluating the impact are set out in Appendix 1 to the Landscape Assessment. The predictions and assessments of effects were made in the context of the proposed development as set out on drawing number SRB/03 Revision A and SRB/04³⁶ Revision A, prepared by Oaktree Environmental Ltd and dated September 2008.

³⁶ Appendix 30: Drawing No. SRB/04

Baseline Conditions

- 8.5. Location and context - The location and context of the site is shown on Plan TAG 1 appended to this report. The site is located within the Barry Dock complex within an area of existing employment uses and disused industrial sites. The town centre is located to the northwest at higher level. The site itself is 8 metres above sea level. Access to the site is gained from a network of industrial estate roads accessed from Millennium Way, a new road to the north of the site serving the docks and new development further west. The Cardiff to Bridgend railway line is located to the north of that road, and between the road and the site is disused and overgrown land, and the dock railway spur line. Immediately adjacent to the site to the west of Woodham Road are a row of Nissen type industrial buildings accessed from Woodham Road that are in active use. Woodham Road itself is used for lorry parking.(Photograph 1 of the Landscape Assessment). To the immediate east of the site is open, unused land and a number of fairly modern warehouse or industrial buildings, a scrap metal yard and a haulage depot.(Photographs 2 and 3 of the Landscape Assessment). To the south of the site beyond David Davies Road, a railway line and grass is located adjacent to the Dock. Across the dock itself is an 8 storey high grain store building and open storage of containers and pallets. (Photograph 4 of the Landscape Assessment). A large chemical works complex is present to the north east, within a distance of 1 km. The nearest residential development is located on Dock View Road to the north and at a distance of 370 metres. The road lies at approximately 30 metres A.O.D at that point, beyond Millennium Way and the railway line.
- 8.6. Site characteristics - The site extends in area to 0.77 ha (1.86 acres). It is flat and open with no formal boundary enclosures other than some mounding to prevent vehicular access to the west and south, and steel palisade fencing to the east. There are no buildings present on the site. The characteristics of the site in terms of vegetation and ecology are described in a specialist report prepared by RSK Carter Ecological Ltd. In summary the site consists of either bare ground or ruderal (colonising) grassland, with some scrub vegetation. In landscape terms it is derelict and strewn with litter and fly tipping. Photograph 1 of the Landscape Assessment shows the nature of the site itself and a plan showing the site as existing is attached to the report as TAG 2

- 8.7. Landscape Policy and Designations - Neither the site nor adjacent land is subject to any National or Local designation in landscape terms. It does not fall within an AONB or an Area of Special Landscape. An Area of Special Landscape is located to the north of Barry (The Dyffryn Basin & Ridge Slopes SLA) but there is no intervisibility between the two as Barry town is set on a ridge and lies between the two areas. The site does not either fall within or adjacent to a designated urban conservation area.
- 8.8. Landscape Character Assessment - The Special Landscape Area described above, together with others within the Vale of Glamorgan was designated as the result of a landscape assessment prepared as part of the UDP process. The assessment was based on data known as 'Landmap', a GIS system developed by the Countryside Council for Wales in conjunction with other partners. The system covers the whole of Wales and allows a location based evaluation of land in terms of a variety of factors including visual and sensory geology, history, cultural landscape, and landscape habitat
- 8.9. The site falls within the 'Barry' landscape area. The Landmap classification for the site and its surroundings for visual and sensory factors is rated as 'Urban' and the evaluation is 'Low'.
- 8.10. Visual Amenity and Prominence - The site is open to view from the immediately adjacent road network. (photograph 1 of the Landscape Assessment). Scrub vegetation adjacent to the eastern boundary gives some low level screening from that direction. (Photograph 2 of the Landscape Assessment). Distant views are possible from higher ground to the north along Dock View Road (Photographs 5, 6, 7 and 8 of the Landscape Assessment) These views are all gained in the context of the Dockland as a whole with large buildings and open storage and the chemical works to the south east. The views are not constant. Vegetation adjacent to the railway line gives some screening, and progressing along the road to the north east the views become oblique and the site is difficult to identify. Views may be possible from the upper storey of the Dock office, which being on a highpoint obscures views from further west. Views from Barry Town further north are obscured by the buildings located on Dock View Road itself. Views

cannot be gained from the new Millennium Way port access road due to intervening vegetation. Views cannot be gained from the railway or from Barry Dock railway Station for the same reason (Photograph 9 of the Landscape Assessment). Longer distant views can be gained from a residential road (Dyfrig Street) located on the eastern edge of Barry Island at a distance of 0.7 km. These views are gained in the context of existing industrial buildings to the west and east of the site, and the chemical works in the distance. (Photograph 10 of the Landscape Assessment) .Views of the site from the east/south east are not possible due to intervening dockside development.

8.11. Zone of Visual influence - Figure TAG 3, attached to the Landscape Assessment shows the photograph viewpoints described above together with a zone of visual influence (ZVI) within which views of the site may be gained. The map does not imply that views will be possible from all points within the zone due to localised screening, but it sets the outer limits of potential views.

8.12. Sensitivity of Receptors - From the baseline studies the following sensitive receptors are identified:

- Landscape - The quality of the site itself in terms of ecology and visual appearance is such that it is not considered to be sensitive in respect of any change that might take place.
- Visual Impact - Views from within industrial areas are not considered to be sensitive. Views from dwellings are normally considered to be sensitive though this has to be tempered with the understanding that there is no right to a view in planning law. Views from roads are not normally considered to be sensitive as they are transient in nature. Views from public footpaths are considered to be sensitive if they are used for recreational purposes or are part of the civic realm.

8.13. Baseline Projection - If the site were not to be developed it is likely to remain either in its present condition (i.e. derelict and unused) or it would be redeveloped for some form of acceptable use within the use classes order. Air photograph coverage for the site shows that it was previously used for the storage of large vehicles. The Unitary Development plan shows the site within an existing employment site and within land

designated as 'Developed Coast'. The site does not fall within the area known as The Barry Waterfront which is located to the west of the site at a distance of 0.3 km. The location of this development area is identified on plan TAG 3. If the site remains unused it will gradually colonise with maritime scrub vegetation.

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

- 8.14. The construction phase of development would involve the clearance of the site of existing vegetation, levelling, the excavation of ground for foundations, and the construction of an industrial building with flue stack and external parking areas. It is understood that there will be no external storage. The building size is proposed to be 60x45 metres in plan and 14.08 metres to the ridge. The flue stack indicated on the application plans is 20 metres high though it is understood that this will be lower. The colour of cladding and means of enclosure of the site are as yet undetermined.
- 8.15. In landscape terms it is not anticipated that any impacts of significance will arise. This assessment is based upon the lack of any landscape features on the site worthy of retention, and its current derelict appearance.
- 8.16. In terms of visual impact, views of the construction activity including on site plant and possibly cranes will be present for a period of 12 months. Such activity might be seen from properties located on Dock View Road, but mainly from the upper floors of properties. Longer distance views would be gained from residential properties located on Barry Island. These views will be gained in the context of adjacent industrial and dock activity. Our assessment of this impact is that it will be negligible.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

- 8.17. Landscape Impacts - There will be no adverse landscape impacts during the operational phase.

8.18. Visual Impacts - The only significant views will be views from domestic property located on Dock View Road and Dyfrid Street. The change in visual impact would amount to the introduction of a new industrial building into a highly industrialised setting. The scale of the new building would be no greater than industrial units constructed to the east of the site. The flue stack would be a maximum of 20 metres high, which is only 6 metres higher than the building itself. Views gained from the properties described would be gained in the context of substantial structures located on the dockside, and a major chemical complex with numerous tall and prominent chimneys. The overriding element of the view is however the sea and the distant coast line of North Somerset. Even without mitigation we would assess any visual impact as negligible (i.e. imperceptible) assuming that the colour of the building and flue stack is appropriate to its surroundings. The flue will not emit any plume of smoke or water vapour and will cause no visual impact as the result.

8.19. Impact on landscape character - The existing character of the site and its surroundings is that of an industrial dockside landscape. It is described within the Unitary Development Plan as being within the developed coast. The proposed development is considered to be appropriate within its setting and there will be no adverse impact on landscape character. The site is not located within the Waterfront Regeneration area which is located to the west, and there is no inter-visibility between the two.

Additional Mitigation Opportunities

8.20. The planning application drawings show the building elevations to be coloured green though it is understood that the choice was indicative. In our opinion, given the location of the building, a palette of mid to dark grey would be more appropriate and we would recommend that the flue stack colour be graded from dark adjacent to the building to light grey above the roof line. Boundary treatments should be simple and be coloured black. On-site soft landscape is not considered necessary for screening purposes but if required to satisfy bio-diversity objectives could be achieved by simple blocks of salt tolerant native shrubs located immediately adjacent to the boundaries of the site.

Residual Impacts

8.21. The residual landscape and visual impact of the development assuming appropriate attention to building and flue stack colour would be Major beneficial.

Impact Summary Table

Environmental Topic		Description of Impact		Description of mitigation measures	Description of residual impact	
		Description in words	Significance		Description in words	Significance
Landscape	Construction Impact	Some long views of plant and construction activity	Negligible	None	No residual impact	Negligible
	Operational Impact	Minor	Negligible	Ensure finished colour harmony	Replace present dereliction	Major positive

9. ASSESSMENT: NOISE

Introduction

- 9.1. AB Acoustics were commissioned by Oaktree Environmental Ltd to undertake an environmental noise assessment the proposed site of the installation of a Biomass Gasification Plant to generate electricity from reclaimed wood (Woodham Road Barry CF63 4JE). At the present time the site operates as a storage yard - it is proposed to locate the proposed plant within a building on the existing site – it is understood the generator plant will operate on a 24 hour basis.
- 9.2. However this 24 hr operation will consist only of the operation of the generator plant and it is understood that no other equipment will be operated on a 24 hr basis – effectively the plant will be loaded with material for processing during the 'normal' hours that the plant operates and this material is then fed by means of a conveyor into the proposing plant.

Assessment Methodology

- 9.3. Below is a plan of the site and the location of the nearest residential properties at which the existing background noise levels were measured:



9.4. Location 1 was on Dock View Road opposite the junction with Castleland Street. Location 2 was at the entrance to the waste ground – which it is proposed to develop at some future date - on Cory Way. Location 3 was on the residential estate at Cei Dafydd. The noise level generated by the proposals is predicted for the residential properties at the three locations. All calculated levels are FREE FIELD.

9.5. **Noise Assessment Criteria** The likelihood of complaints about noise from industrial plant can be assessed where the standard is appropriate using BS 4142 – 1997. Within the standard, another standard, BS 8233- 1987 is introduced for general guidance on acceptable noise levels within buildings. Guidance in BS 8233 –1987 (Sound Insulation and Noise Reduction in Buildings) provides design criteria for noise inside dwellings. These are:

- Bedrooms $L_{aeq,T} = 30$ dB
- Living Areas $L_{aeq,T} = 35$ to 40 dB

9.6. The 30 dB to 40 dB $L_{aeq,t}$ level in BS 8233 – 1987 is in line with the night time internal noise criteria in PPG 24 of 30 dBA. This level is acceptable as avoiding disturbance to sleep. An internal criteria of 35 - 40 dB $L_{aeq,T}$ 5 mins. Would translate to an outdoor limit of 50 - 55 dB $L_{aeq,T}$ 5 mins. where, by convention, an open window would provide an attenuation of 15 dBA, however an attenuation of 12 dBA is a more realistic figure.

9.7. The BS 4142 assessment method considers the likelihood of noise from specific noise sources provoking complaints from residents of nearby sensitive properties. The Specific Noise Level is the noise level of the source or collection of sources under investigation and should exclude any other noise sources which may otherwise contribute.

9.8. The likelihood of complaints is assessed by comparing the noise level from the specific noise source(s) under investigation, against the typical prevailing background noise levels. The audible characteristics of the specific noise source(s) are also taken into

account ie. If the noise contains any distinct hums, whines or bangs etc. then a correction of +5 dBA should be added to the measured level. This then becomes the Rating Level.

- 9.9. The margin by which the noise level due to the specific noise source under investigation exceeds the background noise level enables the likelihood of complaints to be assessed. The greater this distance 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.
- 9.10. If the rating level is more than 10 dB below the background level this is a positive indication that complaints are unlikely.
- 9.11. Equipment used and measurement method – the noise levels were measured using a Norsonic Type 114 real time octave band analyser (Type 1 instrument). Calibration was carried out prior to the measurements and checked afterwards using a Norsonic Acoustic Calibrator. The measurements were carried out at the locations described at a height of 1500mm above the ground and away from reflecting surfaces. The measurements were undertaken at the times stated in the results.

Baseline Conditions

- 9.12. The baseline conditions for the three locations are tabulated below.

Location 1 – Dock View Road

- 9.13. The main noise sources at the time of the measurements were traffic movement along Dock View Road and Ffordd y Mileniwm together with a contribution from both passenger and freight traffic on the railway.

Table 9.1: Baseline Conditions at Location 1

Date	Time	Weather Conditions	<i>Acc</i> L _{Acc}	<i>Background</i> L ₉₀
18.12.08	15.30 - 16.30	Dry - westerly wind 4.3 - 5.2 m/sec - dry roads	62.1	55.6
18.12.08	22.00 - 22.30	Dry - westerly wind 3.5 - 4.4 m/sec - damp road (measurement)	55.8	43.1

			time reduced due to weather conditions)		
18.12.08	23.10 23.20	-	Dry – westerly wind 2.7 m/sec – damp roads	48.0	44.9
19.12.08	00.25 00.35	-	-	44.4	41.6

Distance from site scaled at 294m (reference: Google Earth)

Location 2 – Cei Dafydd

9.14. The main noise source at the time of measurement was traffic movement along Fford y Mileniwm.

Table 9.2: Baseline Conditions at Location 2

Date	Time		Weather Conditions	L _{Aeq}	L ₉₀
19.12.08	09.20 10.20	-	Dry – westerly wind 0.5 m/sec – dry roads	53.1	46.5
18.12.08	21.20 21.50	-	Dry – westerly wind 3.5 – 4.4 m/sec – damp road (measurement time reduced due to weather conditions)	47.1	43.4
18.12.08	23.25 23.35	-	Dry – westerly wind 2.7m/sec – damp roads	41.4	41.2
19.12.08	00.40 00.50	-	-	40.5	40.1

Distance from site scaled at 182m (reference: Google Earth)

Location 3 – Cory Way

9.15. The main noise source at the time of the measurement was traffic movement along Cory Way with cars and lorries accessing the industrial estate together with a contribution from traffic on Ffordd y Mileniwm.

Table 9.3: Baseline Conditions at Location 3

Date	Time		Weather Conditions	L _{Aeq}	L ₉₀
18.12.08	14.15 15.15	-	Dry – westerly wind 0.5 m/sec – dry roads	60.8	53.1
18.12.08	20.45 21.15	-	Dry – westerly wind 3.5 – 4.4 m/sec – damp road (measurement time reduced due to weather conditions)	47.1	43.4
18.12.08	23.45 23.55	-	Dry – westerly wind 2.7m/sec – damp roads	41.4	41.2
19.12.08	00.55 01.05	-	-	40.5	40.1

Distance from site scaled at 450m (reference: Google Earth)

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

Table 9.4 Sound pressure levels associated with typical construction activities

Construction Activity/ Associated Plant	Typical Sound Pressure Level dB(A) at 10m	Estimated Sound Pressure Level dB(A) at 250m
Site Preparation		
Dozer	75	45
Tracked Excavator	78	48
Wheeled Backhoe Loader	68	38
Excavation		
Dozer	81	51
Tracked Excavator	79	49
Loading Lorry	80	50
Articulated Dump Truck	81	51
Rolling and Compaction		
Roller	79	49
Vibratory Plate	80	50
Piling		
Hydraulic Hammer Rig	89	59
Large Rotary Bored Piling Rig	83	53
Welding/Cutting Steel		
Welder (Welding Piles)	73	43
Generator for welder	57	27
Cutter (Cutting Piles)	68	38
Other		
Large Lorry Concrete Mixer	77	47
Concrete Pump (Discharging)	67	37
Tower Crane	77	47
Total	-	62

9.16. The potential impact of noise that may be generated during the construction phase has been assessed in the above table taking a worst case scenario of no mitigation and all plant running simultaneously. The calculations are for the nearest noise sensitive properties at Location 1 on Dock View Road opposite the junction with Castleland Street. This indicates that the worst case is that noise levels are elevated at Location 1 from a background noise level of 55.6 dBA to an estimated 62 dBA. When piling

operations are taken out of the calculations, and this is reasonable as they will only last for a short period of time, the overall level reduces to 59 dBA.

Additional Mitigation Opportunities

9.17. The main opportunity for mitigating noise concerns is for the hours of operation of plant and machinery during the construction phase to be restricted to 0700h – 1800h and this is not an unreasonable requirement.

Residual Impacts

9.18. With the proposed mitigation in place, there is only at worst a minor impact from the construction phase.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

Internal Noise

9.19. All the proposed plant will be located internally to the proposed building – no actual measurements have as yet been undertaken on the type of plant that it is proposed to operate within the proposed building, however the following noise levels of various plant items are believed to be:

- Engines: 85 dBA – as there are 6 of these the level will increase to $85 + 10\log 6 = 93$ dBA;
- Coolers: 73 dBA;
- Roller Mill: 90 dBA;
- Grinder: 120 dBA.

9.20. These levels are as yet to be confirmed by the various suppliers. However the client (Sunrise Renewables Ltd) has stipulated that the general internal level in the plant must not exceed 90 dBA (this will of course mean that internal acoustic treatments etc will be required) though this may not be the case at all locations. This is therefore the internal level that is used in the following discussion. The internal noise from the process will be radiated by the structure of the building itself.

Location 1

9.21. The residential properties at Location 1 (Dock View Road) will look down onto the proposed plant as they are elevated above the proposed site – therefore they will have a view of both the rear facade of the building and the roof.

9.22. The area of the building that faces the residential properties = $45 * 14.08 = 633.6$ sq m (rear facade). Roof area = $60.6 * 45 = 2727$ sq m. The attenuation of the building envelope would be an $R_w = 25$ dBA (ref : www.kingspanpanels.com) for a typical trapezoidal panel – this is the figure that is used in the following calculations. Therefore the Specific Noise Level radiated by the building can be calculated using:

Rear Facade

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Measured Level – 90 dBA

R = the sound reduction index of the building element which in this case is **25 dBA** – see above

S = surface Area of building facing the residential property = **633.6 sq m**

.r= distance to houses = **294m**

DI= Directivity Index = 3

$$L_2 = 90 - 6 - 25 + 10 \log 633.6 - 11 - 20 \log 294 + 3$$

$$L_2 = 30 \text{ (29.6) dBA}$$

Roof

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Measured Level – 90 dBA

R = the sound reduction index of the building element which in this case is **25 dBA** – see above

S = surface Area of building facing the residential property = **2727sq m**

.r= distance to houses = **294m**

DI= Directivity Index = 3

$$L_2 = 90 - 6 - 25 + 10 \log 2727 - 11 - 20 \log 294 + 3$$

$$L_2 = 36 \text{ (35.9) dBA}$$

- 9.23. However the residential properties are at an angle of approximately 300 to the proposed plant therefore the attenuation can be calculated from $A = 10 \log \text{angle} / 180 = 10 \log 30 / 180 = - 8 \text{ (7.77)}$ – reducing the noise level radiated from the roof at Dock View Road to $36 - 8 = 28 \text{ dBA}$.
- 9.24. To obtain the total level these two calculated levels need to be summed – $30 + 28 = 32 \text{ (32.1) dBA}$.

Location 2

- 9.25. At the present time there is no residential development on this site – however it is understood that there is a proposal to develop the site for residential properties – the time scale for this is unknown – if the proposed plant is installed prior to the residential development then it would seem reasonable that the possible residential development should cater for any noise that is radiated from the proposed industrial plant.
- 9.26. The residential properties at Location 2 (Cory Way) could only see the side facade of the proposed plant. The area of the building that faces the potential residential properties is 853.2 sq m. The attenuation of the building envelope would be an $R_w = 25 \text{ dBA}$ (ref : www.kingspanpanels.com) for a typical trapezoidal panel – this is the figure that is used in the following calculations.
- 9.27. Therefore the Specific Noise Level radiated by the building can be calculated using:

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Specified Level – 90 dBA

R = the sound reduction index of the building element which in this case is

25 dBA – see above

S = surface Area of building facing the residential property = 853.2

.r= distance to houses = 182m

DI= Directivity Index = 3

$L_2 = 90 - 6 - 25 + 10 \log 853.2 - 11 - 20 \log 182 + 3$

$L_2 = 35 (35.1) \text{ dBA}$

Location 3

9.28. At the present time there is NO residential development between this location and the proposed site – however if the possible residential development does go ahead then it may be that this location will be acoustically screened from the proposed industrial site thereby attenuating the following calculated noise level. The residential properties at Location 3 (Cie Dafydd)) at the present time see the side facade of the proposed plant. The area of the building that faces the potential residential properties 853.2sq m. The attenuation of the building envelope would be an $R_w = 25 \text{ dBA}$ (ref : www.kingspanpanels.com) for a typical trapezoidal panel – this is the figure that is used in the following calculations.

9.29. Therefore the Specific Noise Level radiated by the building can be calculated using:

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Specified Level – 90 dBA

R = the sound reduction index of the building element which in this case is 25 dBA – see above

S = surface Area of building facing the residential property = 853.2 sq m

.r= distance to houses = 450m

DI= Directivity Index = 3

$L_2 = 90 - 6 - 25 + 10 \log 853.2 - 11 - 20 \log 450 + 3$

$L_2 = 27 (27.2) \text{ dBA}$

Overall Level

9.30. The predicted noise level at the various residential properties are summarized below:

Location 1 = 32 dBA

Location 2 = 35 dBA

Location 3 = 27 dBA

- 9.31. These levels are the calculated Specific Noise Level for the various locations – with respect to BS4142 a +5 dBA correction factor should be added to the above figures to account for the tonal character etc of the noise – therefore the resulting Rating Levels are:

Location 1 = 37 dBA

Location 2 = 40 dBA

Location 3 = 32 dBA

- 9.32. These are the levels that are compared to the lowest measured background (L_{90}) at the various locations:

	Difference to rating level
Location 1: 41.6 dBA (00.25 – 00.35)	- 4.6 dBA
Location 2: 40.1 dBA (00.55 – 01.05)	- 0.1 dBA
Location 3: 40.1 dBA (00.40 – 00.50)	- 8.1 dBA

- 9.33. Therefore if the specified internal level of 90 dBA is achieved then the external level from the proposed plant at the various locations will be equal to or less than the measured background level – this is an indication that complaints about noise will not be received.

Additional Mitigation Opportunities

9.34. The following should be noted : No roof lights should be fitted into the roof as these do not have as high an attenuation as the 'normal' roof panels. If the internal level within the proposed plant is in excess of the specified 90 dBA (or is projected to be) then the attenuation of the panels forming the skin of the building must be increased to account for the increase in internal noise level – further details www.kingspanpanels.com.

Cumulative Effects

9.35. From the report issued by AB acoustics dated 23 December 2008 background noise levels were measured at three locations – 1 Dock View Road / Castleland Street – 2 Cory Way and 3 Cei Dafydd (Y Rhodfa) with the following results (copied from our report dated 23 December 2009).

9.36. These levels are the calculated Specific Noise Level for the various locations – with respect to BS 4142 a +5 dBA correction factor should be added to the above figures to account for the tonal character etc of the noise – therefore the resulting Rating Levels are :

Location 1 : 37 dBA
Location 2 : 40 dBA
Location 3 : 32 dBA

9.37. These are the levels that are compared to the lowest measured background (L_{90}) at the various locations :

	Difference to Rating Level
Location1 : 41.6 dBA (00.25 / 00.35)	- 4.6 dBA
Location 2 : 40.1 dBA (00.55 / 01.05)	- 0.1 dBA
Location 3 : 40.1dBA (00.40 / 00.50)	- 8.1 dBA

9.38. Therefore if the specified internal level of 90 dBA is achieved then the external level from the proposed plant at the various locations will be equal to or less than the measured background level – this is an indication that complaints about noise will not be received.

- 9.39. The following should be noted - No roof lights should be fitted into the roof as these do not have as high attenuation as the steel roof panels.
- 9.40. If the internal level within the proposed plant is in excess of the specified 90 dBA (or is projected to be) then the attenuation of the panels forming the skin of the building must be increased to account for the increase in internal noise level – further details www.kingspanpanels.com
- 9.41. With respect to the predicted levels for the Biogen Plant (taken from Table 9.5 – page 128 - of The Environmental Statement for the Barry Energy Recovery Facility prepared by Parsons Brinckerhoff Ltd) it is seen that the predicted Rating Level at the two common locations is calculated to be :
- | | |
|-------------------------------------|-----------|
| St Mary's Avenue / Dock View Road) | = 24 dBA |
| Y Rhodfa | = 28 dBA. |
- 9.42. Therefore to calculate the overall level of noise should both plants be approved then both these calculated Rating Levels need to be added together :
- | |
|--------------------------------------|
| Location 1 = 37 + 24 = 37 dBA |
| Location 3 = 32 + 28 = 33 (33.4) dBA |
- 9.43. If these new calculated Rating Levels are then compared to the lowest measured background levels above the following results :
- | |
|------------------------|
| Location 1 = - 4.6 dBA |
| Location 3 = - 7.1 dBA |
- 9.44. Therefore if the specified internal level of 90 dBA is achieved for the Biomass Plant then the external level from the proposed plant and the additional Biogen Plant at the two locations will be less than the measured background level – this is an indication that complaints about noise will not be received.

9.45. However in the acoustic report for the Biogas Plant a lower background level (measured at approximately 01.40 – Y Rhodfa and at approximately 03.40 – Dock View Road) was recorded : these are quoted as 29 (28.5) dBA and 30 (29.7) dBA respectively.

9.46. If these background levels are used then the combined effect of both plants operating with respect to background levels is :

Location 1 = +8 dBA

Location 2 = + 3 dBA

9.47. Location 1 therefore results in an increase in noise level that is between that which is considered of marginal significance and that which could result in complaints with respect to BS 4142. Therefore the external level could be reduced by either reducing the internal level within the plant to 85 dBA (rather than the 90 dBA suggested in the report dated 23 December 2009) or by increasing the attenuation offered by the building envelope.

9.48. If a 5 dBA increase in attenuation is achieved then the increase in noise level from both plants will be below that which is considered to be of marginal significant with respect to BS 4142.

Impact Summary Table

Environmental Topic	Description of Impact		Description of mitigation measures	Description of residual impact		
	Description in words	Significance		Description in words	Significance	
Noise	Construction Impact	Periodic elevation of noise above background levels at some receptors	Moderate	Equipment maintenance and restricted hours.	No long term significance	Negligible
	Operational Impact	Potential for noise impact on workers and neighbours	Major	Noise screening and containment	No unacceptable noise impact at sensitive receptors	Minor

10. ASSESSMENT: TRAFFIC

Introduction

- 10.1. This section addresses the proposed plant's impact on the surrounding highway network.

Assessment Methodology

- 10.2. Eight new local employees will be based at the plant at Woodham Road, Barry Docks, within an established industrial area. The plant has adequate parking on site for vehicles and cycles and will potentially receive up to 20 HGV loads of fuel per working day, during the hours specified below, depending upon the payload of the delivery vehicles.

- 10.3. The site will operate on a 24 hours basis to produce electricity but it will only receive deliveries of fuel and visits from third parties and the public during the following hours:

Monday to Friday	07:00 - 22:00
Saturday	07:00 - 20:00
Sunday / Bank / Public Holidays	07:00 - 16:00

- 10.4. Facts relating to this document:

- The plant has a maximum fuel requirement of 216 tonnes per day.
- The bulk density of waste wood varies from approximately 240 to 520 kg/m³.
- Vehicle payloads range from 30 to 96 m³.
- The maximum gross vehicle weight permitted is 44 tonnes for an articulated vehicle, with a maximum payload of 28 tonnes. 28 tonnes equates to a volume of between 53 and 116 m³.
- The applicant favours the use of walking floor trailers to deliver fuel, which reduce double handling and maximise delivery payloads. The likely payload of the walking floor trailers, taking into account varying densities, is between 20 and 25 tonnes.
- The payload stated in the application statement used a worst case scenario of 15 tonnes per load but that has been superseded by the figures above. At 20 to 25

tonnes per load the likely deliveries to the plant will be between 9 and 11 loads per day.

- 11 loads per day as the daily HGV deliveries, generating a total of 22 movements is used in this document as a worst case scenario.

10.5. Some fuel will be delivered by boat but it is likely that there will be periods when dockside deliveries do not occur, leaving the figures above unchanged. When deliveries by boat take place it is likely that the delivery will contain 3 days' fuel. The number of loads quoted also include the removal of materials off site as return loads, to maximise haulage efficiency.

10.6. Vehicle movements during the construction phase are likely to be lower than the maximum stated above. The planning application states that 8 other vehicles (employees and visitors) will arrive at/depart from the site each day, generating 16 movements. The construction phase is expected to be less than this level of usage as HGV movements will be restricted to delivery of materials and some removal of soil from the site.

10.7. The site is located off Woodham Road, with vehicular access from David Davies Road. Access on to the surrounding road network is gained via Cory Way onto Millennium Way. The proposed site location is within the area known as the Waterfront Strip. It is served by the A4050, A 4055 and A4231 local roads, providing links to the national network and Cardiff. These roads are identified as the Southern Corridor and Airport/M4 Corridor in the Vale of Glamorgan Local Transport Plan.

10.8. Traffic information for the local road network was obtained from The Vale of Glamorgan. The data arose from a traffic survey carried out on 30th September 2008 and is attached as Appendix 1.

10.9. The 12 hour (07:00 - 19:00) total value and the HCV (Heavy Commercial Vehicle) count focusing on both directions of travel for the 2 roundabouts near the site was used to compare and determine the vehicular movement impact for the proposed development.

Baseline Conditions

10.10. Below is a summary of results from 5 traffic counts using the aforementioned data.

- Millennium Way – Dock Entrance (Wimbourne Road – A): The traffic flow that contained the highest vehicular movement was in the Cardiff Rd to Millennium Way direction with a total of 4,942 vehicular movements of which 91 were HCV/HGVs. The count for Atlantic Way is still relevant despite the road being closed as it reveals the vehicle numbers travelling to the docks.
- Millennium Way - Dock Entrance (B): The traffic flow that contained the highest vehicular movement was in the Millennium Way to Cardiff Rd direction with a total of 5,605 vehicular movements of which 100 were HCVs.
- Millennium Way - Dock Entrance (Wimbourne Road 2 way): The two way leg on the Millennium Way road was counted at 12,541 vehicle movements in the 12 hour period of which 272 were HCVs.
- Millennium Way - Dock Entrance (Cardiff Road 2way):The two way leg on the Cardiff Road was counted at 12,711 vehicle movements in the 12 hour period of which 579 were HCVs.
- Millennium Way - Dock Entrance (Wimbourne Road): The two way leg on the Docks entrance was counted at 4,158 vehicle movements in the 12 hour period of which 469 were HCVs.

Assessment of Effects and Significance: Construction Phase

Predicted Impacts

10.11. The construction of the proposed plant over a period of some 12 months will result in insignificant volumes of traffic.

Assessment of Effects and Significance: Operational Phase

Predicted Impacts

10.12. The results of most significance are presented in the table below, with the % increase calculations using 11 vehicles i.e. 22 movements [routes labelled A-C for ease of reference]:

Route & Direction	12 hour total vehicles	increase in total vehicle nos from HCVs	increase in HCV nos	increase in HCVs & buses
A: Millennium Way - Dock Entrance (Wimbourne Road) Millennium Way leg 2 way	12,541 vehicles 272 HCVs 459 HCVs & buses	0.18%	8.08%	4.79%
B: Millennium Way - Dock Entrance (Wimbourne Road) Cardiff Road leg 2 way	12,711 vehicles 579 HCVs 757 HCVs & buses	0.17%	3.80%	2.91%
C: Millennium Way - Dock Entrance (Wimbourne Road) Docks Entrance leg 2 way	4,158 vehicles 469 HCVs 552 HCVs & buses	0.53%	4.69%	3.99%

10.13. The application proposals are to import fuel by road between the hours of 07:00 and 22:00, which is a 15 hour day. 11 deliveries per 15 hour day would average out at one every 82 minutes. If the deliveries were restricted to the times during which the survey was carried out deliveries would average out at one every 65 minutes.

10.14. The overall impact in terms of additional traffic is low and the increase in heavy vehicle traffic on the 3 routes presented in the table above range from 2.91 to an 8.08 % increase in movements. The 8.08% increase would not occur as most traffic arriving at the site would arrive from the Cardiff Road direction (route B) with the impact being an increase in HCVs of 3.8%. The increase in HCVs entering/leaving the Dock would be 4.69%. These figures are reduced further if buses are added to the heavy vehicle count.

10.15. The majority of HCV traffic coming from Cardiff Road towards Millennium Way (route B) enters the Dock so 22 additional movements added to the existing 469 is not considered significant.

Additional Mitigation Opportunities

10.16. A Green Travel Plan has been developed for the site and was submitted with the planning application. The Green Travel Plan is appended³⁷ and demonstrates the company's awareness of its need to promote sustainable travel, and its' responsibility in reducing the impact on the local and wider environment.

10.17. The applicant has already indicated that a unilateral undertaking will be signed in relation to sustainable transport contributions and would also be willing to include a traffic routing agreement to ensure vehicles adhere to agreed routes.

Impact Summary Table

Environmental Topic		Description of Impact		Description of mitigation measures	Description of residual impact	
		Description in words	Significance		Description in words	Significance
Traffic	Construction Impact	No significant additional traffic	Minor	Control of hours of construction activity	Not significant	Negligible
	Operational Impact	No significant additional traffic	Minor	Green Travel Plan and contribution to sustainable travel	Not significant	Negligible

³⁷ See Appendix 22

11. ASSESSMENT: WATER RESOURCES

Introduction

- 11.1. As part of the planning application RSK Environment Ltd was commissioned to provide an assessment of Flood Risk. Consultation with the Environment Agency for Wales confirmed that the site was not at risk from flooding. As such a Flood Consequences Assessment was not required.



Part C: Conclusions

12. IMPACT SUMMARY TABLE

Environmental Topic		Description of Impact		Description of mitigation measures	Description of residual impact	
		Description in words	Significance		Description in words	Significance
Air Quality	Construction Impact	Dust and vehicle exhaust emissions	Minor	Vehicle maintenance, dust damping and sweeping	No long term effects	Negligible
	Operational Impact	Process and vehicle emissions,	Moderate	Stack height and emissions treatment and filtering	No residual effects	Negligible
Ecology	Construction Impact	None	Negligible	N/A	None	Negligible
	Operational Impact	Airborne emissions	Minor	Stack height and emissions treatment and filtering	No residual effects	Negligible
Ground Conditions	Construction Impact	Contamination exposure of construction workers	Moderate	Capping, disposal or treatment of contaminants following further surveys	No long term significance	Moderate
	Operational Impact	None	Negligible	Site will have been treated to break contaminative linkages	Removal of existing contaminants	Moderate positive
Landscape	Construction Impact	Some long views of plant and construction activity	Negligible	None	No residual impact	Negligible
	Operational Impact	Minor	Negligible	Ensure finished colour harmony	Replace present dereliction	Major positive

Noise	Construction Impact	Periodic elevation of noise above background levels at some receptors	Moderate	Equipment maintenance and restricted hours	No long term significance	Negligible
	Operational Impact	Potential for noise impact on workers and neighbours	Major	Noise screening and containment	No unacceptable noise impact at sensitive receptors	Minor
Traffic	Construction Impact	No significant additional traffic	Minor	Control of hours of construction activity	Not significant	Negligible
	Operational Impact	No significant additional traffic	Minor	Green Travel Plan and contribution to sustainable travel	Not significant	Negligible

13. CONCLUSIONS

- 13.1. The above Impact Summary Table demonstrates that even prior to mitigation measures, the impact of the proposed development will be minor/negligible on ecology, landscape and traffic; there is potential for the proposals to have a moderate impact on air quality and ground conditions and a major impact on noise.


- 13.2. Following the incorporation of mitigation measures the proposed development will have only a minor/negligible impact on air quality, ecology, noise and traffic. There will be a moderate positive impact on ground conditions due to the removal of existing contaminants and a major positive impact on landscape due to the development of a derelict site.

- 13.3. The proposed development will have no short, medium or long-term adverse effects on the environment and will result in significant improvements to ground conditions and landscape.

14. DIFFICULTIES ENCOUNTERED

14.1. When undertaking the site walkover for the Preliminary Risk Assessment it was not possible to gain access to the locked storage container yard located on the north of the site and as such the contents of the yard and containers is unknown and could not be taken into account within the PRA.

14.2. No other difficulties were encountered.

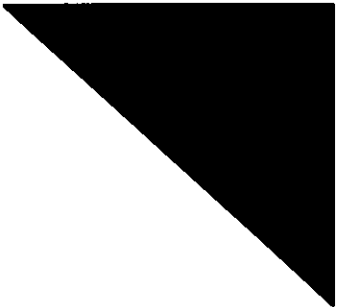


Appendix 1 Screening Request

Barry Biomass Plant Screening Request - Proposed Application Summary*

No.	Subject	Information for consideration	
1	Type of development	"Schedule 2 - 3. Energy industry - industrial installations for the production of electricity, steam and hot water"	
2	Site area	Approx 0.77 ha, or less subject to lease agreement - site split into 2 areas. >0.5 ha - Screening opinion required.	
3	Description of the proposed application	Proposed Industrial Building and Installation of 9MW Biomass Gasification Plant to Generate Electricity From Reclaimed Timber on Land At Woodham Road, Docks, Barry [on land outlined in red on attached Drawing No. SRB/02].	
4	Fuel requirement	1 tonne per MW/hour over 8,000 hours per annum = 72,000 tonnes per annum	
5	Possible effects upon the environment	<p>Emissions and outputs:</p> <ul style="list-style-type: none"> i. Engine exhaust gases (subject to abatement in accordance with Environmental Permit) ii. Condensate from gas cooling recirculated and used in cooling system iii. Char/ash - reusable as fuel, for block making iv. Fly ash - block making, recycling or disposal <p>The plant will operate on a 24 hour basis within an enclosed building. The plant will have a combined exhaust emission stack of <15m in height. The fuel preparation operation will take place within a building. The site is classed as a recovery activity.</p>	
6	Status under the "EP (E & W) Regs 2007" ¹	<p>Permit will be required in accordance with Schedule 1- Part 2 - Chapter 1 - Energy Activities - Section 1.1 - Combustion Activities - Part A(1) (b) (iii)... rated thermal input of ≥3 MW & ≤50 MW [permit to be issued by the Environment Agency]. The permit will condition the operation of the plant and any emissions. All emissions to meet WID.</p> <p>Wood chipping is an exempt (registered with EA - Paragraph 13 - Schedule 3 activity)</p>	
7	Sensitive areas	(a) SSSI	No
		(b) W&CA 1981 Nature Conservation Order	No
		(c) SSSI within 2km	Yes
		(d) National Park	No
		(e) the Broads	No
		(f) World Heritage Site	No
		(g) Scheduled monument	No
		(h) AONB	No
		(i) European site/ SAC/SPA (refer to Drawing No. SRB/07)	Yes - not on site
8	Other information	(a) Flood risk area [Flood risk assessment has been commissioned]	Possibly
		(b) Discharges to surface water	No
		(c) Discharges to foul sewer (condensate)	Yes

No.	Subject	Information for consideration
9	Benefits	<ul style="list-style-type: none"> i. Reduction in waste to landfill. ii. Additional outlet for recycled wood as a buffer against the fluctuating board mill and animal bedding market sectors for recycled wood chip. iii. Contributes to national and regional targets for renewable energy provision. iv. Contributes to reduction in carbon dioxide emissions. v. Supply of energy to the grid equivalent to the annual usage of over 21,000 households (average household consumption in the UK is 3,300kWh). vi. Reduction in vehicle movements to local landfill sites. vii. Will utilise the latest technology available for biomass energy schemes providing a source of both heat and electricity locally (via the National Grid).
10	Summary of Drawings, maps and plans	
	Drawing No. SRB/01	Site Location Map
	Drawing No. SRB/02	Site Location Plan
	Drawing No. SRB/03	Process Layout
	Drawing No. SRB/04	N/A
	Drawing No. SRB/05	N/A
	Drawing No. SRB/06	N/A
11	Other supporting information	
	Reference: SRB/07	Protected Sites Map
	Reference: SRB/08	Flood Risk Map [Flood risk assessment has been commissioned]
	Reference:	N/A
	Reference:	N/A
	Reference:	N/A
	Reference:	N/A
<p>Notes:</p> <p>*This request is made pursuant to Regulation 5 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 [as amended].</p> <p>¹ "EP (E & W) Regs 2007" means the Environmental Permitting (England and Wales) Regulations 2007.</p>		



Appendix 2 Council's Response to Screening Request



Appendix 3 WAG Direction 01

Adran yr Amgylchedd, Cynaliadwyedd a Thai
Department for Environment, Sustainability and Housing



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Mr D Heath
Sunrise Renewables Ltd
Gilbert Wakefield House
67 Bewsey Street
Warrington

Eich cyf : Your ref:
Ein cyf : Our ref:A-PAA 12-02-095
Dyddiad : Date: 17 June 2009

Dear Sir,

TOWN AND COUNTRY PLANNING ACT 1990
TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
(ENGLAND AND WALES) REGULATIONS 1999 (AS AMENDED)
PROPOSED WOOD FUELLED RENEWABLE ENERGY PLANT AT LAND OFF
WOODHAM ROAD, BARRY

1. I refer to your application for planning permission dated 5 September 2008 made to the Vale of Glamorgan Council, reference number 2008/01203/FUL.
2. I am authorised by the Minister for Environment, Sustainability and Housing to consider whether Environmental Impact Assessment (EIA) of the proposed development is required in accordance with the provisions of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999.
3. The development proposed is described as the *Erection of new industrial building and installation of 9MW wood fuelled renewable energy plant* and the Council have issued a screening opinion that EIA of the proposed development, in accordance with the 1999 Regulations, is not required. I have considered the papers and take the view that the proposed development also falls within the description at paragraph 10 of Schedule 1 to the 1999 Regulations – waste disposal installation for the incineration or chemical treatment of non-hazardous waste with a capacity exceeding 100 tonnes per day.
4. Accordingly, in exercise of the authority referred to in paragraph 2 above and the powers conferred on the Welsh Ministers by regulation 4(7) of the 1999 Regulations, I hereby direct that the proposed development for which planning permission is sought by your application reference number 2008/01203/FUL, is EIA development under the 1999 Regulations. This letter constitutes the statement required by regulation 4(6)(i).



BUDDSODDWE Mewn Pŵel
INVESTOR IN PEOPLE

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Ceri.litherland@wales.gsi.gov.uk
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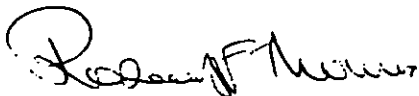
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You are reminded that under regulation 7(3) the Vale of Glamorgan Council must notify you that an environmental statement must be submitted to them. You must respond to that notification within 3 weeks or your application will be deemed refused under regulation 7(7) of the 1999 Regulations.

Under Regulation 2(1) of the 1999 Regulations, an Environmental Statement must contain, for the purpose of assessing the likely impact on the environment, the information specified in that regulation. I recommend that you refer to the Regulations and the accompanying Welsh Office Circular 11/99 ('Environmental Impact Assessment') before and during the preparation of the statement. Guidance on the preparation of Environmental Statements was issued by the former Department of the Environment, Transport and the Regions and entitled "Preparation of Environmental Statements for Planning Projects that require Environmental Assessment: A Good Practice Guide" (HMSO, £15.00, ISBN 9780117532076). This guidance is still available and may be of use to you, although the statutory provisions mentioned in the guidance have been superseded.

I am sending a copy of this letter to the Vale of Glamorgan Council.

Yours faithfully



Rosemary Thomas
Chief Planner/Deputy Director
Department of Environment, Sustainability and Housing



Appendix 4 Representations made to WAG in
response to Direction for EIA

Sedgwick Associates

24 Queensbrook, Spa Road, Bolton, BL1 4AY

Tel 01204 522236 Fax 01204 525355

Email: paul.s@sedgwickassociates.co.uk

Ms Rosemary Thomas
Chief Planner/Deputy Director
Department of Environment, Sustainability and Housing,
Welsh Assembly Government
Cathays Park
Cardiff
CF10 3NQ

Your Ref: A-PAA 12-02-095

Our Ref: sa/pks/4116

24 June 2009

Dear Ms Thomas,

**TOWN AND COUNTRY PLANNING ACT 1990
TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT
ASSESSMENT) (ENGLAND AND WALES) REGULATIONS 1999
PROPOSED WOOD FUELLED RENEWABLE ENERGY PLANT AT LAND
OFF WOODHAM ROAD, BARRY.**

Marco Muia and I write to you collectively in this case. Mr Muia is the agent for the above application and an expert consultant on environmental regulation, whilst I am a specialist planning advisor to the applicant company.

Your letter of 17 June 2009 to Mr D Heath of Sunrise Renewables Ltd setting out your screening direction that the above proposals constituted EIA development under Schedule 1 of the regulations came as a surprise, to say the least. The Barry application is one of a series of four proposals all of the same capacity, using the same technology from the same provider, using the same woodchip feedstock specification and all located on docks. The other three schemes proposals have screening opinions to the effect that they are not EIA developments and they all have recent planning permissions. Sedgwick Associates have a current application in Bolton for a 20Mw plant and the SoS has recently directed that it is not an EIA development and we know of numerous other plant of over 100 tonnes per day capacity which have been allowed without an EIA.

We have been looking for the reason why your decision is at variance with our experience of current practice in these other cases. Our view is that as this is not a plant for the chemical treatment of waste, you have based your decision on the plant incinerating waste. If it did that, given its size in excess of 100 t.p.d it would fall to be considered EIA development. However, the process employed is not incineration but pyrolysis also known as Advanced Thermal Conversion (ACT). Incineration is where the material is burnt in a furnace and generates heat. Pyrolysis on the other hand is where heat is applied indirectly to a substance in the absence of oxygen to convert the organic material to a gas, usually

known as syngas. You will see from the attached briefing that the EA distinguish between incineration and pyrolysis, a position also adopted by DEFRA. It is also worth noting that under the governments Renewable Obligation Order they place a clear distinction between Incineration and Advanced Thermal Conversion when accrediting the plant for Renewable Obligation Certificates banding. It is worth visiting the BERR website for the clear definitions on Pyrolysis v Incineration:

<http://www.berr.gov.uk/energy/sources/renewables/policy/renewables-obligation/what-is-renewables-obligation/page15633.html>

In the light of the above discussion, it is suggested that your screening direction was based on a misunderstanding of the process involved in this instance. The planning issues in Barry is rather confused at present as there is also an application for waste incineration on the docks in front of the Council and residents and groups such as Friends of the Earth have shown difficulty in distinguishing between the two proposals.

We ask that you to review your Direction in the light of this additional information and explanation of the process involved in our client's proposals. Hopefully, you will be prepared to do this as your current position equates pyrolysis to incineration and that all pyrolysis plant over the threshold size are EIA developments under Schedule 1 of the regulations. This will throw great uncertainty over all of the other developments referred to above and significantly increase the planning costs of proposals of the many other schemes that are now in the pipeline.

We would be pleased to provide you with any additional information that might help you review this matter, or to discuss it with your officers. As we have just over two weeks in which to commit to an EIA or to withdraw the application, we would welcome a response from you within that timescale.

Yours sincerely,



Paul Sedgwick
Dip TP MRTPI



Marco Muia
BSc, MSc, MCIWM
Director
Oaktree Environmental Limited

Enc.



Waste management options

In 2006/07 we reused or recycled (including composting) around 31 per cent of municipal waste in England and 30 per cent in Wales. In addition, approximately eleven per cent (in England) and two per cent (in Wales) municipal waste was treated, by energy from waste plants. Some waste was pre-treated using various specialist methods like mechanical biological treatment (MBT) and anaerobic digestion.

Waste treatments explained

Reuse

Using an object or material again, either for its original purpose or for a similar purpose, without significantly altering the physical form of the object or material.

Recycling

Using waste as material to manufacture a new product. Recycling involves altering the physical form of an object or material and making a new object from the altered material.

Composting

Uses naturally occurring micro-organisms to break down organic waste to produce compost. Wood chippings, grass cuttings or kitchen waste are all used in composting. The quality of the compost depends on the quality of the waste being composted. At best, the compost can be sold as a soil improver and, at worst, the material may only be suitable as a fuel or for landfill cover.

Mechanical Biological Treatment

A range of treatment activities that include sorting and separating, cutting or grinding and composting the waste. Shredded waste is subjected to aerobic digestion for 10-15 days which stabilises the waste. A combination of sieving, weight separation and metal extraction splits the waste into recyclable materials and a residue. The residue is suitable for burning and energy recovery. The residue remains classified as waste.

Anaerobic digestion

The natural decomposition of organic waste in an oxygen-free atmosphere. This produces gas, mainly methane and carbon dioxide, which is burnt to produce electricity and a residual material which can be used as a soil improver depending on the type of inputs to the process.

Gasification/pyrolysis

In gasification, part of the waste is burnt which provides the heat for the remaining organic material. Pyrolysis involves indirect heating of the waste in an oxygen-free atmosphere. The organic material is converted into gases, which can be burnt to produce heat and electricity.

Incineration

Involves burning waste at high temperatures to reduce its volume and produce heat and/or electricity.

Landfill

An area of land where waste is deposited. The biodegradable part of the waste decomposes and reduces in volume. Some of the gas produced by decomposition is increasingly used to generate electricity.

customer service line

08708 506 506

incident hotline

0800 80 70 60

floodline

0845 988 1188

www.environment-agency.gov.uk



Appendix 5 WAG Direction 02

Adran yr Amgylchedd, Cynaliadwyedd a Thai
Department for Environment, Sustainability and Housing



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Mr D Heath
Sunrise Renewables Ltd
Gilbert Wakefield House
67 Bewsey Street
Warrington

Eich cyf : Your ref:
Ein cyf : Our ref: **A-PP172-51-qA786890**
Dyddiad : Date: **9 July 2009**

Dear Sir,

TOWN AND COUNTRY PLANNING ACT 1990
TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
(ENGLAND AND WALES) REGULATIONS 1999 (AS AMENDED)
PROPOSED WOOD FUELLED RENEWABLE ENERGY PLANT AT LAND OFF
WOODHAM ROAD, BARRY

1. Following the issue of my letter of 17 June 2009, in which I directed that the above proposed development required Environmental Impact Assessment in accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, I have received correspondence from a number of your advisers expressing

- (i) their disagreement with my conclusion that the proposed development falls within the description provided in Schedule I(10) of the 1999 Regulations; and
- (ii) their view that the letter did not satisfy the requirements of regulation 4(6)(i) of the 1999 Regulations in that it did not give clearly and precisely the full reasons for the conclusion that the proposed development required EIA.

2. I am authorised by the Minister for Environment, Sustainability and Housing to reconsider the issue of whether EIA of the above proposed development is required.

3. I have reconsidered the question of EIA in the light of your advisers' correspondence and, on reflection, I agree that my letter could have contained more information on the reasoning behind our conclusion to enable you to consider and assess that reasoning. I accept that this does raise some doubts as to the validity of the direction and, as such, I



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GTN: 1208 3489

consider it to be in the interests of good administration to withdraw the Direction. Consequently, I hereby withdraw the Direction dated 17 June 2009 that EIA of the above proposed development is required.

4. The question remains, however, as to whether EIA of the above proposed development is required. In that respect I am fully aware that what is proposed is an installation for the production of electricity. I am also aware, however, that the description of development does not, and cannot, preclude consideration of whether any other elements of the proposal would be EIA development.

5. Of the projects identified in Schedules 1 and 2 of the 1999 Regulations relating to the disposal of waste, the project described at Schedule 1(10) appears the most appropriate to consider in the context of the proposed development. The project identified at Schedule 1(10) relates to *"Waste disposal installations for the incineration or chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9 of non-hazardous waste with a capacity exceeding 100 tonnes per day."*

6. With that in mind, I have noted from information submitted by Oaktree Environment Ltd with your planning application that the plant will be *"fuelled by reclaimed wood arising from local recycling operations."* Also, in the report prepared by the Planning Officer of the Vale of Glamorgan Council it is indicated that *"the wood fuel accepted will be manufactured from clean wood, pallets, construction timber and other woods which have been removed from the construction and demolition waste stream locally."* In the light of this information, and bearing in mind the ECJ judgement in Case C-486/04 (Commission v Italy (2006)) as to the meaning of the concept of waste disposal in the context of the EIA Directive, I am satisfied that the proposed development should be regarded as involving the disposal of waste.

7. I am satisfied that the fuel to be used in the proposed development is non-hazardous waste. From the information provided with the planning application the capacity of the plant will be some 200 tonnes per day – well in excess of the limit indicated in Schedule 1(10).

8. As to the method of disposal. Your advisers have all stressed that the process does not involve the disposal of waste by incineration but its disposal by pyrolysis and are of the view that the latter should not be considered to be a type of the former. They have also pointed out that the Environment Agency distinguish between incineration and pyrolysis, a position adopted by DEFRA. I also note that the substances resulting from the treatment are to be incinerated at the proposed development.

9. I acknowledge that there is a distinction between incineration and pyrolysis but, for the purposes of determining whether EIA is required of the proposed development, I do not consider that distinction to be material. In coming to that conclusion I have had regard to the guidance contained in the European Commission's document *"Interpretation of definitions of certain project categories of annex I and II of the EIA Directive"* and other relevant matters.

10. The document advises, in respect of Schedule 1(10) projects, that definitions of waste, chemical treatment and incineration plants can be found in the guidance to Schedule 1(9) projects. That guidance includes the following statement:-

"The Waste Framework Directive uses the term 'incineration' but does not define it. However, Article 3(4) of the Waste Incineration Directive defines 'incineration plant' as 'any stationary or mobile technical unit and equipment dedicated to the thermal treatment of wastes with or without recovery of the combustion heat generated. This includes the incineration by oxidation of waste as well as other thermal treatment processes such as pyrolysis, gasification or plasma processes in so far as the substances resulting from the treatment are subsequently incinerated.'"


11. I acknowledge that neither the EIA Directive, nor the Waste Framework Directive to which the Schedule 1(9) project description refers, define the term "incineration" and that definitions contained in other Directives should not simply be unquestioningly applied to terms in the EIA Directive. But, equally, it would not be appropriate to exclude pyrolysis from the meaning of "incineration" here simply because domestic guidance or practice distinguishes the two in some contexts and, as the guidance points out, European waste legislation is a useful reference point. However, in my view the principal consideration must be what will best serve the general objective of the EIA Directive, namely that projects likely to have significant effects on the environment should be made subject to an assessment of their effects.

12. I have revisited the information before me in the light of the above comments and those made by your advisers and, having regard to the nature of the processes to be carried out in this particular development, I consider that on balance the development is unlikely to have significant effects on the environment by virtue of factors such as its nature, size or location. I have therefore concluded that on balance it would not be appropriate to consider the proposed process to be incineration for the purposes of the EIA Directive

13. Accordingly, in exercise of the authority referred to in paragraph 2 above and the powers in regulation 4(7) I hereby direct that the proposed development is not EIA development.

14. I am sending a copy of this letter to the Vale of Glamorgan Council and your advisers.

Yours faithfully



Rosemary Thomas
Chief Planner/Deputy Director
Department of Environment, Sustainability and Housing

Signed under authority of the Minister for Environment, Sustainability and Housing, one of the Welsh Ministers



Appendix 6

Officer's Report to Committee
application no. 2008/01203/FUL)

5. **The applicant/developer/operator shall be advised that the Crematorium cannot be operated before an Environmental Permit is in place and should contact the Council's Public Protection Department.**
6. **Please note that a legal agreement/planning obligation has been entered into in respect of the site referred to in this planning consent. Should you require clarification of any particular aspect of the legal agreement/planning obligation please do not hesitate to contact the Local Planning Authority.**

Please note that this consent is specific to the plans and particulars approved as part of the application. Any departure from the approved plans will constitute unauthorised development and may be liable to enforcement action. You (or any subsequent developer) should advise the Council of any actual or proposed variations from the approved plans immediately so that you can be advised how to best resolve the matter.

In addition, any conditions that the Council has imposed on this consent will be listed above and should be read carefully. It is your (or any subsequent developers) responsibility to ensure that the terms of all conditions are met in full at the appropriate time (as outlined in the specific condition).

The commencement of development without firstly meeting in full the terms of any conditions that require the submission of details prior to the commencement of development will constitute unauthorised development. This will necessitate the submission of a further application to retain the unauthorised development and may render you liable to formal enforcement action.

Failure on the part of the developer to observe the requirements of any other conditions could result in the Council pursuing formal enforcement action in the form of a Breach of Condition Notice.

2008/01203/FUL Received on 21 January 2009

**Sunrise Renewables Limited, Mr. David Heath, Gilbert Wakefield House, 67, Bewsey Street, Warrington., WA2 7JQ
Oaktree Environmental Limited, Mr. Marco Muia, Unit 5, Oasis Park, Road One, Winsford Industrial Estate, Winsford, Cheshire., CW7 3RY**

Land at Woodham Road, Barry

Erection of new industrial building and installation of 9MW fuelled renewable energy plant

INTRODUCTION

Members will recall that this application was deferred at the 18 June 2009 Committee following receipt of a 'Screening Direction' from the Welsh Assembly Government precluding determination of the application until such time as an Environmental Statement was submitted by the applicants, such letter concluding that the development was 'EIA' development (contrary to the Council's initial scoping opinion).

Following detailed representations by the applicants to WAG, WAG have issued a letter (dated 9 July 2009) in which they have reconsidered the question of EIA. Although the full content of that letter is provided at Appendix I, the letter concludes as follows: -

"...The principal consideration must be what will best serve the general objective of the EIA Directive, namely that projects likely to have significant environmental effects on the environment should be made subject to an assessment of their effects."

I have revisited the information before me in light of the above comments and those made by your advisors and, having regard to the nature of the processes to be carried out in this particular development, I consider that on balance the development is unlikely to have significant effects on the environment by virtue of factors such as its nature, size of location. I have therefore concluded that on balance it would not be appropriate to consider the proposed process to be incineration for the purposes of the EIA Directive.

Accordingly ... I hereby direct that the proposed development is not EIA development"

In light of the above conclusions, there is no longer any impediment to the Council determining the application as submitted.

The following report is that presented to the 18 June Committee (other than where updated to relate to additional representations received).

SITE AND CONTEXT

The site forms part of the wider developed coastal area of Barry Docks, being located to the immediate north-east of the existing industrial units occupying the old Nissen huts on Woodham Road, and to the north of Dock No. 2. Access to the site is via Woodham Road, off the Ffordd-y-Milleniwm roundabout adjacent to the Council's Dock Offices.

The site is currently vacant, having been occupied until recently by a container storage and refurbishment operation.

The site boundary is approximately 250 metres from the existing dwellings on Dock View Road which overlook the site and Docks in general from an elevated position.

DESCRIPTION OF DEVELOPMENT

This is a full planning application made by Sunrise Renewables Limited for a Wood Fuelled Renewable Energy Plant / Biomass Plant of up to 9MW capacity to be contained within an industrial building. The plant will be fuelled by reclaimed wood arising (for example) from local recycling operations.

The application has been accompanied by a significant level of information, with the following key elements taken from the submitted supporting statement (the full information being available for inspection at the Council's Offices):

The Building/ Equipment

The proposed building will be of steel portal frame construction, and would have a span of 45 metres, a length of 60.6 metres, and heights to eaves of 9.97m and ridge of 14.08m. The building would be finished with micro profile or box profile cladding to all external elevations, the colour and specification of which would need to be agreed prior to construction. The roof will have rooflights to reduce the requirement for internal lighting (although it is noted that the submitted noise assessment recommends their deletion to assist noise mitigation).

The south-facing elevation would have two electrically-operated roller shutter doors (6.6m wide) which would be used to enable the wood fuel to be discharged directly into the building.

External plant and equipment on the site will be minimal and will largely consist of an exhaust stack for the gas engine exhaust (sited adjacent to the eastern elevation) which has been shown/ stated as being a maximum of 6 metres above the ridge line of the building i.e. 20 metres, but possibly as low as 16 metres.

The specific plant to be installed within the building is as follows:

<u>Plant</u>	<u>Function</u>
• Wood chipper	Size reduction of feedstock.
• Dryer	Reduction of feedstock moisture content.
• Grinder	Reduction of feedstock to <5mm size.
• 3 x 3 MW pyrolyser	Heating wood waste to produce the raw syngas.
• 6 x Gas engine (1.5 MW)	Burning the refined gas to produce energy.
• Thermal oxidiser	Emissions abatement.
• Exhaust stack	Emits cleaned exhaust emissions from all engines.

The site will be enclosed by new galvanised steel palisade security fencing and gates to a maximum height of 2.4 metres. Parking provision will be 5 spaces plus 1 disabled space.

The Process / Proposal

The design of the plant is being undertaken by Prestige Thermal equipment, with the process involving subjecting the fuel to pyrolysis - defined as the decomposition or transformation of a compound caused by heat.

The plant will be capable of pyrolysing up to 72,000 tonnes of wood per annum. This equates to approximately 216 tonnes per day. The wood fuel accepted will be manufactured from clean wood, pallets, construction timber and other woods which have been removed from the construction and demolition waste stream locally. In short, the plant will process dry, non-hazardous batches of timber and wood.

The plant would have a design life of approximately 25 years and will be operated during the following hours for the receipt of fuel and all other external operations:

- Monday to Friday 07:00 - 19:00
- Saturday 07:00 - 19:00
- Sunday /Bank/Public holidays 08:00 - 16:00

Otherwise the plant will operate as a 24 hour process within the building:

The Biomass plant will operate and provide electricity to the grid 24 hours per day, with allowances for maintenance and breakdowns. The entrance gates will be closed upon the cessation of daily operations to ensure that there is no unauthorised access.

The process is summarised as follows:

- i) Wood fuel at up to 35% moisture content is deposited into a hopper by a wheeled loading shovel which feeds a chipper which reduces the size of the wood prior to entry into the dryer.
- ii) The dryer reduces the moisture content of the wood to 10% in preparation for the grinding process.
- iii) The grinder reduces the wood chips further to a sub 5mm feedstock. Excess heat from the engine exhausts is used in the drying process.
- iv) The fine feedstock is delivered to a silo which enables a constant feed to the pyrolysers.
- v) The fuel is converted into a gas which provides a constant fuel for the engines.
- vi) The engines burn the gas to produce electricity.
- vii) The engines transfer electricity to the grid via an alternator, transformer and substation.

The applicants advise that the benefits of the proposal are:

- Reduction in disposal of wood to landfill.
- Additional outlet for recycled wood as a buffer against the fluctuating board mill and animal bedding market sectors for recycled wood chip.
- Contributes to national and regional targets for renewable energy provision as well as providing additional energy capacity.
- Contributes to reduction in carbon dioxide emissions.
- Supply of energy to the grid equivalent to the annual usage of approximately 22,000 households (average household consumption in the UK is 3,300kWh).
- Reduction in vehicle movements to local landfill sites.
- Will utilise the latest technology available for biomass energy schemes providing a source of both heat (can be used up to 1km from the site) and electricity locally (via the National Grid).

They also advise that the installation of the new Biomass plant is amongst the first of its kind in the UK and will result in the generation of a minimum of 8 local jobs based at the site and further jobs at the designated fuel supplier.

A copy of an Email sent to Councillors Drake & Elmore to "clarify various issues and misconceptions" about their submissions (submitted as late rep to 18 June Committee) is reproduced at Appendix L.

Submitted Documentation

Substantial information has provided in support of the application, including:

Planning Statement; Design and Access Statement; Waste Audit and Facilities Strategy; Green Travel Plan; Sustainability Statement; Ecology Report; Noise Assessment; Fuel Supply Assessment; Transport Assessment; Air Quality Report and report on combined heat and power submissions.

In addition, the applicants have recently submitted a colour booklet, accompanied by a letter, seeking to brief stakeholders and clarify inaccuracies/ misconceptions. A copy of this is provided at Appendix M.

PLANNING HISTORY

The application was preceded by a request for a Screening Opinion (ref: 2008/00828/SC1) in August 2008, to consider whether the proposal required the formal preparation of an Environmental statement. This concluded as follows:

"Having regard to Schedule 3 of the Regulations, the Local Planning Authority is of the view that the characteristics of the development, the location of the development and the characteristics of the potential impact as outlined in the supporting documentation to the request are such that an Environmental Impact Assessment is not required.

It is recommended, however, that the applicants are made aware of the need for any application to be supported by the submission of details on environmental issues, particularly concerning traffic impact, noise and air quality (including a study to establish the potential impacts that emission to air may have on statutorily designated ecological sites) as well as the need for submission of an appropriate design statement / visual assessment and sustainability assessment of any proposals as part of any application."

The site has no specific planning history relating to its current use other than an application in 1987 as follows:

87/00821/FUL - Woodham Way, Barry Docks. Construction of plant store.
Approved 17 November 1987.

Other Relevant History

It is also of note that an application is currently being considered on land accessed off of Atlantic Way within Barry Docks, Barry for the "Change of use from B2 - General Industrial Use to Sui Generis - Waste Use which would include operational development in the form of the construction of a gasification waste to energy plant for non-hazardous waste (ref: 2009/00021/FUL)".

This application is yet to be reported to Planning Committee, but in brief it proposes an Energy Recovery Facility which would process approximately 80,000 tonnes of residual waste per annum to create approximately 7.5 MWe renewable energy for transfer to the National Grid.

That development proposes 4 buildings with a maximum height of 23.58m, with an emission stack 45 metres in height.

CONSULTATIONS

Barry Town Council commented on the initial notification as follows:

"Whilst being generally most supportive of renewable energy projects the Town Council is of the opinion that the proposed Biomass Plant would be better suited to a site situated further away from existing and proposed residential areas and the business / industrial operations located adjacent to this site on Woodham Road.

The submitted information has failed to overcome concerns that:

1. Local residential amenity and working environments could be compromised by emissions, dust, noise and other adverse effects of the proposed development.

2. The large plant and exhaust stack cannot be accommodated within the townscape without undermining visual amenity to an unacceptable degree. Although these structures would be set within an existing industrial environment they would be very prominent when viewed from elevated areas of the Town of Barry, recently developed Waterfront sites and from the future redevelopment area of East Quay.

In addition there is real concern that the safe, free flow of traffic on highways within the raw material collection area may be compromised by the movements of large vehicles generated by this project.

In its present form the application is therefore considered to be contrary to Policies ENV25, ENV27, ENV29 and WAST2 of the adopted Vale of Glamorgan Unitary Development Plan.

This Council is however aware that the applicant has been requested by the Local Planning Authority to supply additional essential information about the proposed development. The Town Council therefore requests to be reconsulted once this material becomes available."

The Town Council has also made the following comments following receipt of the additional documentation:

"Very strong objection on the following grounds:

- The site has complex topography, close to buildings on higher ground and the Castleland hill with a cliff-like drop from Dock View Road. Winds are variable, cannot be well predicted and mean the emission plume will at times ground amidst the housing.
- The wood-fuel could contain contaminated wood (with metal-based or chlorine-based chemicals) which produces dioxins. Though such fuel is not permitted (except in plants that meet the Waste Incineration Directive standards), there have to be strict protocols and monitoring to cut out such contaminated wood. On past experience, one cannot presume perfect compliance – and dioxin release so close to housing is not precautionary.
- If the char is burned as fuel, the ash would contain ultra-fine particles which are considered to be especially hazardous to health; this should therefore be clearly excluded.
- Though precautions are taken against fire, a risk of fire via poor maintenance, accident or malicious act still remains; pollution from such fires is unacceptable in the urban area.
- The high stack is visually intrusive and detrimental to the urban area.
- Lorry routes for the wood-fuel; routes taken could well pass through the town, otherwise the residential Cadoxton Moors Road. Free flow of traffic will be compromised by a random number of additional movements of large vehicles generated by this project.

- Though the plant claims to be CHP, the 12-15 MW (megawatts) of heat is far, far more that could be used in offices/workshops locally. Unless the proposers can show they have uses for a significant fraction of the heat (say, >3MW) the CHP designation should be considered as cosmetic only.
- The fuel tonnages and combustion technology should rule out this plant as 'light industry'; it is not acceptable close to residential areas. "

Countryside Council for Wales does not object to the proposed development, considering it unlikely to affect any designated sites in the vicinity. They also state that they are unaware of any protected species in the area that may be affected by the proposal (see also supplementary ecology comments below).

Environment Agency Wales (EAW) (comments on original submissions) advised that the development will require an Environmental Permit, regulated by the Environment Agency. They also advise that they have no adverse comment in terms of flood risk, and provide no detailed site-specific advice or comments with regard to land contamination issues, based on the assumption that gross contamination is not present at the site.

In their additional representations (dated 11 March 2009), EAW have advised (in summary) that the proposed development will require a permit under the Environmental Permitting (England & Wales) Regulation 2007, including demonstration of compliance with the waste Incineration Directive technical requirements, emission limit values and continuous emissions monitoring. Particular attention should be given to the consideration and demonstration of credible and viable combined heat and power opportunities at the site.

They also consider that the new information provided shows a good understanding of potential air impacts to the local environment, which will be considered in more detail at the time of the EPR application, at which time the Agency would carry out an appropriate assessment of the environmental impacts to all media of this process, together with an in-combination effects from other EPR licences when determining a permit.

A copy of their full representations are provided at Appendix A.

Dwr Cymru / Welsh Water request that conditions be imposed relating to foul water and surface water discharges and land drainage run-off, while providing advice in respect of the required Discharge Consent, sewage treatment and water supply.

The Head of Economic Development and Leisure (Ecology) advises as follows:

"Plant Species : Rough Marsh-mallow (*Althaea hirsuta*) has been recorded as established at a nearby site.

- It is recommended that the developer be made aware that *Althaea hirsuta* is listed on Schedule 8 of the Wildlife and Countryside Act 1981 and that it is an offence to pick, uproot or destroy any wild plant listed as such.

- It is recommended that a botanical survey be completed for the site prior to consent being granted, the potential presence of rough marsh-mallow being a material consideration."

Such a survey has since been submitted, following which the Countryside Council for Wales have commented as follows:

"The Countryside Council for Wales (CCW) does not object to this proposal, but recommends the following to reduce the impact of the scheme.

CCW welcomes the report "Proposed Biomass Power Plant, Barry, South Wales Survey for *Althaea Hirsuta* (Rough Marsh-mallow)" (RSK Carter Ecological Ltd 2009). We note that no rough marsh-mallow plants were recorded; however the surveys were conducted at a time of year that could be considered unsuitable.

We do not believe that the presence of the plant on site would prevent the development from taking place. However, rough marsh-mallow is a locally important plant in the Vale of Glamorgan. CCW would recommend that a suitable area within the development be identified as a potential receptor site for the plant. The site should be searched at an appropriate time of year and any individuals found be relocated to the aforementioned site. We recommend you speak to your Authority's Ecologist in this regard. "

The Director of Legal, Public Protection and Housing Services (Pollution Control) commented on the initial submission advising of the need for additional information with respect to emission to air / air quality; noise and land quality, which have since been supplied, together with the need for conditions in respect of ground investigations. Accordingly they have commented as follows:

"Air Quality Assessment

Any process of this kind will generate emissions to atmosphere. The key issue therefore is to assess whether these emissions significantly impact upon health or the environment both in the immediate vicinity and further afield.

Quantities of some emissions may already be present in the local environment, for example, existing industry or road traffic. Other emissions are generated only from this type of process.

The detailed assessment model considered each scenario and has concluded that the common emissions – specifically Particulate Matter (PM10), Nitrogen Dioxide, Sulphur Dioxide and Carbon Monoxide do not contravene statutory human health objectives. Emission of other pollutants have been modelled using maximum permissible concentrations under the Waste Incineration Directive. Again the model concludes that there is no significant impact.

Whilst I am unable to replicate the modelling process the steps and inputs to the model are logical and comprehensive taking into account any known local air quality, meteorological and topographical. The stack height has also been determined on the basis of this assessment to ensure adequate dispersion.

Noise

The acoustic assessment has been based on an maximum internal noise climate of 90dBA. Its conclusion relies on this being achieved. The modelled sensitive locations have been chosen in consultation with the Pollution Team, on the basis of existing and currently proposed residential development.

The development therefore should benefit from a condition that limits the internal acoustic environment to a maximum of 90 dBA. Although, lower levels would also benefit internal health & safety requirements and correspondingly reduce environmental impact.

We would also recommend that building doorways / openings in frequent use do not face sensitive locations. However, the submitted drawings appear to satisfy this requirement.

Another recommendation would be for the operators of mobile plant within and outside the facility to use reversing safeguards that have low off site impact e.g. bleeper alarms are omni directional and can be audible over some great distance and thus avoided.

Environmental Permitting Regulations

It is important to note that the issue of planning permission is not sufficient to enable the process to legally operate. The process must first apply for and obtain a permit from the Environment Agency. The operators must ensure that they are able to meet the strict requirements of the Environmental Permitting Regulations and the Waste Incineration Directive. The application process will examine in detail any possibility of significant environmental or health impact.

Other Operations

We are aware that there are other application and proposals in the docks area that may contribute similar emission to this proposal. It will be essential that the combined contribution are assessed and that this is done prior to grant of planning permissions.

On the basis of supplied data I consider that I have no ground to object to the development at this stage."

Additional Environmental Health Officer Representations

A visit has since been made to a comparable operation, with additional submissions requested and received relating to the in-combination effects of this and the nearby Biogen proposal (as yet undetermined), which has been assessed by the Pollution Control Team, who have advised as follows:

"Visit to Comparable Operation

I have visited a pyrolysis / gasification plant (Capital Valley - Rhymney) that is claimed to be similar to the two proposed by Sunrise Renewables. The plant was constructed by the same manufacturer. The existing process pyrolysed oily sludges to generate useful hydrocarbon fractions and heat. It appears that the technology has the ability to treat a range of feed products.

Whilst not in operation at time of visit the technology as explained does appear to have the ability to control and limit harmful emissions.

Recommendation : A condition that the plant to process wood fuel only.

Air Quality

The applicants have also provided an updated air quality impact assessment that takes into account the proposed Biogen operation. The model (which I have no ability to replicate) predicts no significant increases in pollution that may impact upon air quality objectives.

Noise

The applicants have also provided an updated acoustic assessment that takes into account the proposed Biogen operation. In this case it was noted that noise in combination at monitoring location 1 Dock View Road / Castleland Street could result in complaint. This acknowledgment is matched by a recommendation that the internal noise environment be reduced to a maximum of 85 dBA through acoustic engineering.

Recommendation : A condition to restrict the INTERNAL plant noise to a maximum of 85 dBA to include a 5 dBA tonal penalty. However every opportunity to reduce this level should be explored and demonstrated prior to final design, permitting (see below) and construction

Environmental Permitting Regulation

It is essential to note that the operation of this process cannot legally occur until it benefits from a Permit issued by the Environment Agency. The permitting process will require the operator to demonstrate that the operation will have no adverse health or environmental impact. Details of the process operation will be scrutinised by the appropriate agencies. This Local Authority will be one of a range of consultees during the permitting process.

Based on information provided I have no ground to object to the development."

The Head of Visible Services (Highway Development) commented on the initial submissions as follows:

"Further to a recent site inspection carried out in relation to the above application for the construction of a renewable energy plant, the Highways Authority has no objection in principle to the above development, subject to the applicant producing a Traffic Assessment for the proposed development, fully detailing any impact during construction and the operating of the plant.

Subject to a satisfactory conclusion of the Transport Assessment, the following conditions shall apply:

1. Any boundary fences are to be set back 4.0m – minimum – from the carriageway edge. This is to allow for adequate visibility splays from the proposed access and to maintain visibility from the existing Woodham Road junction. This will also allow for any footpath to be constructed in the future – if deemed necessary.
2. Visibility splays of 4.0m x 70.0m in both directions, measured from the centre line of the proposed access shall be provided. Nothing, which may cause an obstruction to visibility, shall be placed, erected or grown within this visibility splay.
3. The proposed means of access shall have a hard surface of concrete or bituminous material for a minimum distance of 6.0m from the highway boundary.
4. Parking provisions in accordance with the South Wales Counties Parking Guidelines shall be provided within the curtilage of the site/for each unit, and retained thereafter. This shall include parking for 2 HGV's.
5. Turning facilities shall be provided within the curtilage of the site, as approved by the Local Planning Authority, to enable all vehicles to enter and leave in a forward gear at all times. The parking mentioned above, will not obstruct this turning area at anytime.
6. Gates, if provided shall not open outwards and shall be set back a minimum of 6.0m from the carriageway edge."

Additional comments following receipt of the submitted Transport Assessment are as follows:

"The Highway Authority has now reviewed the submitted Transport Assessment for the above development and the trip generation is potentially 22 HGV's movements (in and out, i.e. 11 vehicles) throughout the day, plus associated staff vehicles to and from the site in a.m. & p.m. peaks. Since the trip generation in the scale of things for Barry Docks is minimal, and the highway network is already designed to take such large HGV's, the Highways Authority has no objection to the proposals.

The trip generation was a worst-case scenario for the proposal. The applicant has also confirmed that some of the material being delivered to the site, will be by sea. This will reduce the number of vehicle movements when these deliveries are made.

1. Barry Docks has good links to the surrounding highway network and the motorway network further afield. The small amount of additional trips generated by the proposal does not create any problems to the adopted highway network.
2. The proposed operating hours are also spread over most of the day with the plant accepting deliveries of timber Monday – Saturday 07.00 to 19.00hrs and on Sundays and Bank / Public Holidays 08.00 to 16.00hrs. Noise and other issues are not deemed a problem because of the industrial location of the proposals.
3. Planning application 09/00021/FUL is for a similar, but larger operation on the opposite side of the dock from this proposal. It involves several other routes for material to arrive at site, including rail. From the Transport Assessment submitted for 09/00021/FUL a total of 14 trips per day will be generated by HGV's arriving/leaving site. It is our opinion that PA 09/00021/FUL in combination with this application will not have a detrimental affect on the public highway.
4. The proposals should incorporate earlier recommendations (dated 28 October 2008) for turning and parking. As well as, improving visibility at the proposed site entrance."

The Head of Visible Services (Waste Management) have provided extensive comments, which are provided in full at Appendix B.

The Council's Energy Manager (Dave Powell) has advised as follows (three sets of responses):

"There are one or two inconsistencies in the bundle of reports.

I would give this development my full support if the following were included in addition to the other commitments within the reports you attached and approval on other issues such as air quality that are being considered by other officers.

- (a) Secure commitment for at least 80% of the waste heat to be re-used in nearby buildings and facilities.
 - (b) The 'biomass' that was to be used was to be only from waste wood products destined for landfill in the UK.
1. They claim that they will use the waste heat from the plant to heat their facilities on site and (section 8.7 of the sustainability report) - "The location of the site makes the reuse of waste heat possible for commercial and domestic purposes. The 23 industrial units adjacent to the site and the proposed Barry waterfront development could benefit from the waste heat."

Putting this into proportion, a 9 MW plant running at 90% availability and 33% efficiency (i.e. 67% of the energy ends up as waste heat) will result in approximately 46 million kWh of energy to be wasted per year (the report doesn't say explicitly where this heat is to be dumped). If we assume that this heat could potentially offset gas supply to boilers for heating then that could result in a saving of around 10,000 tonnes of CO₂ to the atmosphere each year. This is not far off the equivalent CO₂ emissions associated with all the Council non domestic building stock. At the moment the proposal sees that opportunity being completely wasted.

What I would like to see is the project being given approval in conjunction with other developments close by. Or at least for the pipework to be provided for the 23 industrial units and the heating mains as far as is practical be installed ready for connection to a later housing development (or an agreed undertaking to provide those heating mains at a practical moment in the future).

The fuel supply assessment states that all the fuel sources will be:

"2.1 The plant will only gasify fuel derived from waste wood, of the specifications set out below. The designated fuel providers will be required to demonstrate that they can supply feedstock which meets the requirements of this document."

Yet the sustainability statement states that the fuel will be supplied from sustainably managed forests. Which is it? Will it remain that throughout? Will the company be able to change as supply and market forces determine? Using timber from sustainable managed forests is not an option that makes environmental sense when as indicated below that resource can be used in a far more efficient way.

The sustainability report indicates that wood destined for landfill will produce methane. How much? The IPCC report 'Climate Change 2001' Table 4.1a states that the 100 year Global Warming Potential of Methane is 23.

The sustainability report uses the figure 25. Where did that come from?

From an environmental point of view we come to the crux of the matter - is it better to bury the waste wood, or is it better to burn. How much methane will be produced by burying. (I appreciate that there are other arguments to be considered such as availability of landfill but we still need figures on methane emissions to be provided).

We know that biomass fuels are not in abundant supply within the UK. Remote buildings off the gas mains can run biomass boilers which can achieve greater than 85% efficiency as compared to the 33% or so that a biomass CHP will achieve (even though 50% efficiency is sometimes claimed). So certainly we should not be burning biomass suitable for heating boiler plant in CHP such as this unless that plant is able to achieve similar overall efficiencies and this can only be achieved by finding a use for the waste heat.

There is no evidence in the attached reports that any serious attempt has been made to locate such heating requirements."

He subsequently provided the following additional comments:

"The WAG currently has a consultation out. – "Consultation on a Bioenergy Action Plan for Wales (February 2009)" which states that the Assembly Government is particularly keen to see schemes developed that maximise carbon savings; for example:

- local biomass for domestic heating, especially off the gas network;
- biomass for CHP in industries with high heat loads;
- local biomass for generating heat or CHP in communities;
- biomass co-fired with coal in large, efficient power stations;
- contaminated waste wood used in CHP or power stations which comply with waste incineration regulations;
- residual municipal wastes, that cannot be recycled further, used to produce heat and power; and

In this respect he advises that "what would be ideal is the following:

The installations should find a place for waste heat to be usefully used. In other words they should fulfil the criteria for 'Good Quality Combined Heat and Power' It should be noted that temperature drop of only 1 Deg C per km can be achieved by distribution pipework systems meaning that hot water can be distributed effectively over great distances. Yes there is a cost to this infrastructure. If that infrastructure is not in place then 60% or more of the energy from the plants will be completely wasted. And we are talking about vast amount of energy being wasted. The housing in the Vale uses approximately 780,000 GWh for space heating. As mentioned in my earlier email the waste heat from the 9 MW plant would be around 46,000 GWh. 6% of the heating needs of the housing in the Vale of Glamorgan thrown away. With the right infrastructure in place the heating requirements for all the housing on Barry Island could be provided. When we are proposing a plant at the edge of an urban setting should we not be expecting more joined up thinking here.

For 'Good Quality CHP' I don't think it would matter what the source of fuel was. Virgin wood from local sustainable forests would be just as acceptable as waste wood destined for landfill. However, even then, virgin wood from sustainable forests should not substitute waste wood that then goes to landfill.

If you were to decide to go ahead with the plants in the proposed form then it would be unacceptable to use virgin biofuel while wasting 60% of that energy when that biofuel could be used at 80 - 90% efficiency within a biomass heating plant. It could be argued however that fuel that was not suitable for a biomass heating plant (i.e. waste wood) that was otherwise destined for landfill could be burnt in this way.

Note: Submissions by the applicant have been made since these representations to address the matters raised and to demonstrate that the plant would fulfil the criteria for 'Good Quality Combined Heat and Power', such matters being addressed in the section below covering CHP.

In response to these submissions, the Energy Manager has provided a response, which is attached in full at Appendix C. In summary, this acknowledges the potential of the plant, expresses some concern about the use of virgin timber, but considers that it is essential that the waste heat is appropriately used to ensure it is a holistic CP plant.

REPRESENTATIONS

Extensive consultation has been undertaken on this application, including 90 individual letters of notification to addresses in Dock View Road, Robert Street, St. Mary's Avenue, Lower Pyke Street, Woodham Road, Viaduct Road and David Davies Road. Four site notices were also displayed in locations on Dock View Road, Woodham Road, Fford y Milleniwm and Atlantic Way.

In addition, the same addresses/ notifications were repeated in January 2009 following the receipt of additional requested information on matters including Traffic Assessment and Air Quality.

Analysis of Neighbour Responses (updated post 18th June Committee)

A petition (submitted in two goes) totalling 860 names has been received from residents primarily residing on and around Dock View Road stating that:

"We the undersigned object strongly to the proposals for a wood burning bio-mass plant to be constructed in Barry Dock, due to its location close to current properties and increase in noise, traffic and pollution to the local area"

In addition, a second petition of 73 signatories (lead petitioner Councillor Steffan William) was handed in at the 21st May Committee objecting on the same grounds as the above petition.

To date, 57 individual letters of objection have been received (six being second/ repeat letters following consideration of additional information, with 3 being received as letters from John Smith MP).

These letters raise concerns in respect of matters including:

- Proximity to existing residential development, and this being an inappropriate site for development due to such proximity.

- Traffic Impact in general, including noise.
- Noise Impact from operations in general, and from 24-hour operations.
- Pollution in general, with specific reference to matters including smells and emissions.
- Light pollution.
- Health grounds / Quality of Life (including asthmatic sufferers).
- Health and safety, including in emergency.
- Visual Impact and adverse impact on Barry as a whole and the prospective development at the waterfront.
- Impact on Views.
- Green Travel Plan being 'worthless'.
- Reference to combined heat and power being 'cosmetic only'.
- Ecological impact.
- Impact on property prices.
- objection on the grounds that it is a waste disposal plant not the energy generation plant stated in the application; proximity to houses; lack of guaranteed reuse of waste heat.
- impact of exhaust gases and particulates; and more appropriate sites for the facility.
- siting in a highly populated residential area, and impact on road access; pollution; effect on community; impact in future; alternative sites more appropriate.
- potential use for other fuels in addition to wood; air quality; lack of jobs for local people;
- emissions (smells, dioxins) noise from plant and lorries; traffic. Considers the plant to be a good idea but in the wrong location.

Five letters which are generally indicative of the objections received are attached as Appendix D.

In addition, a letter of support from the land owners, Associated British Ports (ABP), has been received, together with a letter of support (via John Smith MP) from a local resident.

Councillor Anne Moore has also objected to the application as follows:

"I would like to submit my objection to the above Planning Application in principle because I feel it will have an adverse impact on the local community and any future developments on the Waterfront site.

I am concerned about the possible noise that could come from this plant, and also the times of the deliveries as I believe 7.00 am is too early and would like some time constrictions placed if this planning application is approved.

I am also concerned that the lorries going to and from the site will be travelling down Cardiff Road and Millennium Way and again if this application is approved I wonder if the access to the site could be considered".

Attached at Appendix E is a set of FAQs (Frequently Asked Questions) submitted by the applicants in response to local residents' concerns expressed at a recent public meeting.

A letter of representation from Councillors Elmore & Drake (reported as late item to previous Committee) has also been received expressing concerns in respect of its location; noise pollution; traffic; public health; pollutants from the plant; lack of employment; visual impact of site; light pollution; amount of wood being burnt; and general concerns over the impact on the local area in terms of regeneration/ tourism etc. (copy attached at Appendix F).

Barry & Vale Friends of the Earth have also submitted objections on grounds including: - failing policies to be energy efficient and be combined heat and power; traffic, dust and emissions; and generation of dioxins from the process. A copy of their representations is provided at Appendix G.

Jane Hutt AM (Vale of Glamorgan) has written in expressing concerns that have been raised with her, namely "that as a result of the introduction of the biomass plants there will be an increase in traffic and noise pollution for the local residents, as well as environmental concerns. There is also concern that the building of the two biomass plants will put at risk the multi-million pound investment of the Waterfront Phase 2 developments which is situated next to the planned biomass power plants" (see Appendix I).

Chris Franks AM (Wales South Central) has objected on grounds relating to the location and adverse impact on work to create a viable community at the waterfront, albeit acknowledging the benefits of renewable energy, and the need to balance local considerations against the urgent need to produce energy from renewable sources (see Appendix J).

Other Representations – Welsh Assembly Government

The Welsh Ministers received a request to call in the application for their determination. In response, a letter has been received which states as follows: -

I have considered the issues associated with the application in the light of Welsh assembly Government's policy on call-in (detailed in Planning Policy Wales) and conclude that they are not of more than local importance. In view of this, I do not consider that the application should be called in for determination by the Welsh Ministers and it is now for your Council to determine the application as it sees fit.

In reaching my decision I did not consider the planning merits of the proposed development and my decision not to call in the application should not in any way be taken as a reflection on the planning merits of the proposal".

A copy of this letter is attached at Appendix H.

The withdrawal of the initial Screening Direction (referred to above) is attached at Appendix I.

REPORT

Members will recall that this application was deferred at the last meeting of Planning Committee for a site visit and an inspection / technical presentation at Capital Valley Industrial Estate in Rhymney Valley, Caerphilly to observe an operating plant.

Planning Policies

A key element of European Union policy that has become central to the UK's national waste strategy is the development of a waste management hierarchy. This prioritises waste management options with the overall aim of achieving a move up the hierarchy. The hierarchy is split into 4 categories in the following order:

1. Reduction - by using technology which requires less material in products and less waste in manufacturing and produces longer lasting products with lower pollution potential.
2. Reuse - e.g. returnable bottles.
3. Recovery - e.g. re-cycling, composting.
4. Disposal - by incineration without energy recovery or by landfill.

Within this context, the following Central and local advice is of direct relevance to these proposals:

National Planning Policy

Planning Policy Wales (as amended by Ministerial Interim Planning Policy Statement (MIPPS) 01/2005 - Planning for Renewable Energy) emphasises the Government's general policy towards waste management, which is based on the waste management hierarchy. Paragraph 12.5.1 highlights the need for local planning authorities to make provision for establishing an integrated and adequate network of waste disposal installations.

In addition it reminds planning authorities that in determining applications, they are obliged by the EC Directives, to ensure that waste is recovered or disposed of without:

- harming the environment;
- endangering human health;
- risking water, air, soil, plants or animals,
- causing a nuisance through noise or odours; or
- adversely affecting the countryside or places of special interest

PPW also advises that the Assembly Government is committed to playing its part by delivering an energy programme which contributes to reducing carbon emissions, having established specific renewable electricity production targets for Wales of 4TWh per annum by 2010 and 7TWh per annum by 2020. These targets should be seen in the context of the Assembly Government's overall Energy Strategy and its commitment to energy efficiency. Planning policy at all levels should facilitate both.

At para. 12.8.4, it advises that the aim is to secure an appropriate mix of energy provision for Wales, whilst minimising the impact on the environment, which will be achieved in part by strengthening renewable energy production. This is seen as recognising the importance of clean energy and the efficient use of natural resources, both as an economic driver and a commitment to sustainable development.

It therefore advises, at paragraph 12.8.6, that "renewable energy projects should generally be supported by local planning authorities provided environmental impacts are avoided or minimised, and nationally and internationally designated areas are not compromised" (my emphasis) In order to broaden the range of renewable energy technologies in Wales planning policy must also favour developments that support research, development and demonstration for alternative sources of renewable energy production.

Consequently, the Assembly Government is committed to:

- achieving its specific targets for renewable energy(electricity) production;
- maximising the opportunities for renewable energy (heat);
- where possible combining the two in combined heat and power systems;
- recognising that the benefits of renewable energy are part of its overall commitment to reduce greenhouse gas emissions.

It further advises (para. 12.8.12) that "Local planning authorities should facilitate the development of all forms of renewable energy and energy efficiency and conservation measures which fit within a sustainable development framework. Specifically, they should make positive provision for such development to meet society's needs now and in the future by:

- Considering the contribution that their authority area can make towards developing and facilitating renewable energy and energy efficiency and conservation, and ensuring that development plan policies enable this contribution to be delivered.
- Ensuring that development control decisions are consistent with national and international climate change obligations, including contribution to renewable energy targets, having regard to emerging national and international policy on the levels of renewable energy required and on appropriate technologies; and
- Recognising the environmental, economic and social opportunities that the use of renewable energy resources can make to wider planning goals and objectives and the delivery of renewable energy targets.

Finally, it notes (para. 12.10.3) that whilst having regard to the contribution of renewable energy use to wider planning goals such as the diversification of the rural economy, local planning authorities should ensure that any potential detrimental environmental effects on local communities are minimised, to safeguard quality of life for existing and future generations.

Consultation on a Bioenergy Action Plan for Wales (February 2009)

The Welsh Assembly Government has recently gone out to public consultation on their "Bioenergy Action Plan for Wales", which seeks to build on its commitment to sustainable development, such as "One Wales".

The document states that the Assembly Government aims to use bio-energy to:

- significantly reduce greenhouse gases emissions;
- contribute to long-term fuel security;
- ensure that the public sector leads by example;
- encourage the development of sustainable forestry and agriculture; and
- support business development and job creation in all parts of the biomass energy supply chain.

It also advises that the Assembly Government is particularly keen to see schemes developed that maximise carbon savings; for example:

- local biomass for domestic heating, especially off the gas network;
- biomass for CHP in industries with high heat loads;
- local biomass for generating heat or CHP in communities;
- biomass co-fired with coal in large, efficient power stations;
- contaminated waste wood used in CHP or power stations which comply with waste incineration regulations;

- residual municipal wastes, that cannot be recycled further, used to produce heat and power; and
- agricultural slurries and food wastes used to generate biogas for local heat or CHP schemes, or for transport.

The stated "scenario for waste wood resource" assumes that there will be, on average, 150,000 tonnes of clean wood recoverable from waste streams in Wales, and 412,000 tonnes of possibly contaminated wood (the latter material can only be used in plant complying with waste incineration regulations).

A recommendation of the document is that WAG will *"work with Local Authorities, building industry and other generators of waste wood on ways to minimise contamination of wood and to segregate it from other waste streams to improve ease of collection"*.

This action plan complements the **Renewable Energy Route Map for Wales** which was issued for consultation in February 2008 and provides a more detailed assessment of the potential for bioenergy.

Technical Advice Note (TAN) 21 Waste (2001) also provides advice on how the land use planning system should contribute to sustainable waste resource management. Moreover, it provides advice to Local Authorities on their responsibilities in respect of various European Directives on waste, emphasising the importance of regional self-sufficiency and the "proximity principle", under which waste should be handled close to the point at which it is generated.

Technical Advice Note (TAN) 8 Renewable Energy (2005) relates to the land use planning considerations of renewable energy. It reiterates the importance of the provision of electricity from renewable sources as an important component of UK energy policy.

In discussing other onshore renewable energy technologies, it also emphasises (para 3.10) that "...development plan policies should be supportive of the generation of electricity from woodfuel", further advising that the fuel supply will clearly be an important locational factor as will the availability of a good transport infrastructure, and connection to a suitable electricity system with available capacity.

"Wise About Waste: The National Waste Strategy for Wales" (June 2002) also promotes a number of actions to improve the management of waste in Wales, including measures to increase the use of recycled and composted materials by businesses and the public sector in Wales, and a public sector waste minimisation campaign.

Regional Guidance

The South East Wales Regional Waste Plan (March 2004) provides a long-term strategic waste management strategy and land-use planning framework for the sustainable management of wastes and recovery of resources in South East Wales. The Plan seeks to ensure that the South East Wales region is, as far as possible, self-sufficient in dealing with its waste arising and has adopted the following regional strategy:

- Aim to achieve the 2020 Landfill Directive targets by 2013.
- Achieve this principally through the maximising of recycling and composting.
- Deal with residual waste by Mechanical Biological Treatment (MBT).
- Choose between either sending the residual waste from MBT to landfill or using it as Refuse Derived Fuel.
- Limit the amount of landfill waste to that which cannot be dealt with acceptably in any other way.

The role of the SEWRWP is to provide a regional strategy within which local authorities and the waste management industry can plan and co-ordinate for the provision of waste facilities to meet the 2020 Landfill Directive targets by 2013. In doing so the SEWRWP identifies the number of facilities and estimate the land required for each authority within the region to meet the anticipated waste arisings.

Consultation has been undertaken on the **1st review of the SEWRWP**, but as yet this has not been published. This consultation document is considered to be of relevance to the determination of this application, insofar as it makes considerable reference to 'recovery of energy' through Energy from Waste (EfW), this being a process where energy in the form of heat and / or power is recovered from burning waste.

Local Policy

Both the Welsh Assembly Government's "Wise about Waste" Strategy and the South East Wales Regional Waste Plan have informed the Council's Municipal Waste Management Strategy (August 2004), which establishes how the Council will meet various waste reduction and recycling targets established in these documents. Similarly, the aim of the policies and proposals contained within this Plan is to facilitate the development of waste management facilities that meet the Council's requirements both locally and regionally.

The Municipal Waste Plan, however, is now out of date and (according to the Councils Waste section) no longer represents the policies of the Council since resolving to join the *Prosiect Gwyrdd* Residual Waste Partnership. This partnership approach is committed to residual municipal waste treatment which is technology neutral, in contrast to the existing Municipal Waste Management Strategy which reflects the preference for Mechanical Biological Treatment (MBT). Meeting WAG targets for municipal waste would now not permit a MBT option without an EFW end use options.

Unitary Development Plan

The Development Plan for the area comprises the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011, which was formally adopted by the Council on 18 April 2005.

Under the chapter on Waste, the following objectives are put forward for the purposes of guiding future decisions relating to waste disposal:

- To ensure that waste disposal is carried out with adequate environmental protection, so that there is no harm to human health, no pollution of the environment and no detriment to the amenities of the locality.
- To ensure that the waste disposal requirements of the County are adequately catered for within the context of other objectives.
- To ensure that waste disposal and other types of waste management facilities are considered within a hierarchy of priorities including:

Reduce (the production of waste)

Re-use

Recover (recycling, composting and energy recovery)

Disposal (with minimum environmental impact)

The UDP as a whole includes the following policies which are of relevance to these proposals:

STRATEGIC POLICY 13 – favours development proposals which encourage sustainable principles for waste disposal based on a hierarchical approach of (i) waste minimisation / avoidance; (ii) re-use of waste; (iii) waste re-cycling or recovery (including waste conversion to energy); and (iv) waste disposal land fill with minimal environmental impact.

WAST 1 PROVISION OF WASTE MANAGEMENT FACILITIES

Proposals for the provision of waste management facilities including the handling, treatment and transfer of waste will be permitted where they are located on:

- i. Existing waste sites;
- ii. Existing and allocated B2 and B8 employment sites;

- iii. Within operational mineral working sites; or
- iv. The case of green waste composting and management, on land within or adjacent to farm building complexes.

Proposals will be considered having regard to the criteria listed in Policy WAST 2.

WAST 2 CRITERIA FOR ASSESSING WASTE MANAGEMENT FACILITIES

Subject to the provision of Policy WAST 1 proposals for waste management facilities will be permitted if the proposal:

- i. Conforms with the principle of the waste hierarchy (reduction, re-use, recovery and safe disposal); the "proximity principle"; the principle of regional self sufficiency; the objective of waste avoidance, reduction and disposal; the setting of targets for reduction and modes of disposal:
- ii. Does not unacceptably affect residential amenity or pose a threat to public health;
- iii. does not unacceptably affect the quality or quantity of water resources (both surface and groundwater);
- iv. has regard to the adequacy of the highway network and the need to minimise the demand on the transport network;
- v. does not unacceptably conflict with the interests of agriculture, nature conservation, areas of ecological, wildlife or archaeological importance or features of geological or geomorphological importance or landscape protection policies;
- vi. has a high standard of layout, landscaping and design;
- vii. provides arrangements for the after treatment and future use of the site which are to the satisfaction of the local planning authority; and
- viii. is not at an unacceptable risk of flooding, including tidal inundation, or does not increase the risk of flooding elsewhere

Para. 10.6.7. of the justification advises that the disposal or treatment of waste in any form is often a controversial issue, no matter how well managed. It is important therefore that any proposals for this type of activity can be thoroughly assessed against the above criteria and that any permissions are conditioned to mitigate and / or abate environmental detriment and nuisance.

COMM 8 OTHER RENEWABLE ENERGY SCHEMES

Proposals for other renewable energy schemes will be permitted if all of the following criteria are met:

- i. the proposal has no unacceptable effect on the immediate and surrounding countryside;
- ii. the proposal has no unacceptable effect upon the sites of conservation, archaeological, historical, ecological and wildlife importance;
- iii. adequate measures are taken, both during and after construction, to minimise the impact of the development on local land use and residential amenity.

Para. 11.4.45. of the justification states that "...the Council recognises that policies for developing renewable energy must be weighed carefully with its continuing commitment to policies which seek to protect the local environment. The Council acknowledges the advice in TAN 8 that proposals to harness renewable energy can display a variety of factors peculiar to the technology involved. ... The Council will assess applications for renewable energy developments in the light of the guidance put forward by the Welsh Assembly Government in TAN 8.

ENV 6 EAST VALE COAST

States that development within the undeveloped coastal zone will be permitted if a coastal location is necessary for the development; and the proposal would not cause unacceptable environmental effects. In areas of existing or allocated development within the coastal zone, any new proposal should be designed with respect to its local context and sensitive to its coastal setting.

The justification notes that, "though outside of the defined settlement boundary for Barry, the Port estate is clearly a developed area and its continued use and development as a commercial/ industrial estate and for the expansion of operational port facilities by ABP is endorsed". (3.4.22 of UDP).

ENV7 - WATER RESOURCES

ENV16 -PROTECTED SPECIES

ENV18 - ARCHAEOLOGICAL FIELD EVALUATION

ENV26 CONTAMINATED LAND AND UNSTABLE LAND

ENV27 - DESIGN OF NEW DEVELOPMENTS

ENV29 - PROTECTION OF ENVIRONMENTAL QUALITY

States that development will not be permitted if it would be liable to have an unacceptable effect on either people's health and safety or the environment: (i) by releasing pollutants into water, soil or air, either on or off site; or (ii) from smoke, fumes, gases, dust, smell, noise, vibration, light or other polluting emissions.

EMP2 NEW BUSINESS AND INDUSTRIAL DEVELOPMENT

States, inter alia, that proposals for new business and industrial development will be permitted if nine specified criterion are met, including that the size and relationship of any new building and / or alteration or extension is not disproportionate to its size and setting; the proposal does not have an unacceptable effect on residential amenity; does not present additional risk to the health or safety of users of the site and does not unacceptably pollute air, water, or land; and does not unacceptably affect the use of the adjoining land by virtue of the risk and impact of potential pollution.

EMP3 GENERAL INDUSTRY

States, inter alia, that development will be permitted for B2 use (general industry) where the proposal is compatible with existing business / industrial / warehousing uses; will not cause detriment to the amenities of nearby residential areas; the nature and scale of the proposed development does not unacceptably affect surrounding uses; it does not present additional risk to the health or safety of users of the site and does not unacceptably pollute air, water or land; and it does not unacceptably affect the use of the adjoining land by virtue of the risk and impact of potential pollution.

TRAN10 - PARKING

TRAN11 - ROAD FREIGHT

States, inter alia, that, in order to reduce the unacceptable environmental effects of heavy goods vehicles...developments which generate HGV movements which would unacceptably affect the amenity and character of the existing or neighbouring environments by virtue of noise, traffic congestion, or parking problems will not be permitted.

Issues

Taking into account the above national, regional and local policy context, together with the local context of the proposed site for the development, it is considered that the primary issues to consider as part of this application are as follows: -

1. The relationship of proposals to national, regional and local policy in respect of the production of sustainable energy from biomass.
2. The overall sustainability of the proposals, including consideration of matters including:
 - The 'proximity principle'
 - Maximising opportunities for use of Combined Heat and Power (CHP)
 - Building Design, including Sustainable Drainage
3. Visual Impact / Design.
4. Impact on local / residential amenity.

5. Traffic Management and Impact on the highway network / highway safety.

In addition, consideration needs to be given to matters such as the Environmental Permitting Programme; Land Contamination; Archaeology; Flood Risk / Water Resources; Ecology, Employment and Educational opportunities.

1. National, Regional and Local policy in respect of the production of sustainable energy from biomass.

The supporting text of Policy WAST2 at paragraph 10.6.6 advises that, when considering proposals for any kind of waste management facility... there will be two main factors to be taken into account. The proposal must firstly be evaluated in terms of its contribution towards the South East Wales Regional Waste Plan (SEWRWP) and secondly the extent to which it meets the Council's Municipal Waste Management Strategy, demonstrating that the proposal represents the best practicable environmental option, taking account of the principles of proximity and the waste hierarchy.

Looking firstly at the SEWRWP, the role of the SEWRWP is to provide a regional strategy within which local authorities and the waste management industry can plan and co-ordinate for the provision of waste facilities to meet the 2020 Landfill Directive targets by 2013. In doing so the SEWRWP identifies the number of facilities and estimate the land required for each authority within the region to meet the anticipated waste arisings.

For the Vale of Glamorgan, the SEWRWP identifies a need to provide for approximately 15.1¹ hectares of land for the provision of waste management facilities capable of serving both local and regional needs. Whilst the SEWRWP does not identify a preferred waste management technology; it does however estimate the number of facilities by technology stream for each local authority.

In this respect, and in relation to the two proposed waste management facilities, the SEWRWP indicates that the Vale has a requirement for the provision of 1 Mechanical Biological Treatment (MBT) followed by a gasification facility (as proposed by application 2009/00021/FUL - Atlantic Way) and 1 MBT followed by an incineration facility (as proposed by this application).

In respect of this proposed facility at Woodham Road, it is noted that whilst the proposal does not involve MBT, as it would receive waste wood recovered from other MBT facilities within the region, it is considered that the facility would nevertheless assist in meeting the wider regional objectives identified within the SEWRWP.

¹ This includes a 20% over provision to allow for a degree of flexibility in site provision as agreed within the SEWRWP.

Strategic UDP Policy 13 and general Policy WAST2 support, in principle, new waste management facilities where the processing of waste conforms to the Council's Waste Hierarchy (Reduction, Reuse, Recovery and Safe Disposal). In this regard the proposal would involve the recovery of energy of residual waste arising and as such would accord with the principles of sustainable waste management sited out within the Council's Waste Hierarchy.

Members will also be aware that the Council is an active member of *Prosiect Gwyrdd*, a regional partnership between five South Wales councils: the Vale of Glamorgan, Caerphilly, Cardiff, Newport and Monmouthshire for the procurement of a residual waste treatment solution. The partnership is working to find a long term solution to 'residual' waste - the waste that cannot be recycled or composted - since the current system of burying waste cannot continue as Wales is running out of suitable sites. It is emphasised, however, that this proposal is not related to this partnership.

In essence, recovering energy from waste which cannot sensibly be reused or recycled is considered to be an essential component of a well-balanced energy policy, such that this proposal would be in general accordance with national and regional waste strategies.

Choice and Suitability of Location in Land Use terms

In identifying suitable locations for new waste management facilities, the SEWRWP recommends that both Local Planning Authorities and the waste management industry should firstly consider existing B2 and B8 employment and industrial sites since the operational processes associated with waste management are similar to other industrial processes - an approach that is also supported within UDP Policy WAST 1.

Similarly, Core Strategic Policy 12 of the Council's Local Development Plan Draft Preferred Strategy identifies both Atlantic Trading Estate and the Operational Port of Barry Docks as suitable locations for the location of waste management facilities that serve both local and regional needs. Whilst at this time the proposals are still draft, this Policy has been drafted in accordance with the SEWRWP and the requirements of TAN 21.

In this respect, it is noted that the SEWRP review (section 11) notes that advances in technology and the introduction of new legislation, policies and practices mean that many modern waste management / resource recovery facilities on the outside look no different to any other industrial building and on the inside contain industrial de-manufacturing processes or energy generation activities that are no different to many other modern industrial processes in terms of their operation or impact.

For this reason, many existing land use class B2 'general industrial' employment sites, existing major industrial areas, and new B2 sites allocated in development plans will be suitable locations for the new generation of in-building waste management facilities this will be required in accordance with the RWP Technology Strategy.

In light of this, the industrial nature of the site and its environs (albeit with regard to the relative proximity to residential properties to the north and prospective development to the west) is thus considered to be an acceptable location for such development, provided it can be demonstrated not to cause harm (discussed below). Purely in locational/ land use terms, therefore, it is considered that the proposal would accord with the principles set out within UDP policy WAST1, advice set out in the SEWRWP, as well as the emerging Vale of Glamorgan Local Development Plan, and would compliment the Council's future strategy for the sustainable management of waste within the Vale and the wider region.

Other Locational Issues – Energy Provision

It is noted that the proposals have highlighted their potential to supply energy to existing industries and businesses within the vicinity as well as future planned development such as that at Barry Waterfront. In this respect, the SEWRWP identifies a number of processes that involve energy generation, and therefore advises that when identifying suitable locations:

“Developers should consider opportunities for co-locating and networking Energy from Waste facilities with proposed or existing energy consuming land uses that could benefit from the heat and/or electricity produced – such as large industrial energy users or district heating systems in industrial estates.” (SEWRWP 1st Review, 2008 page XIX refers)

In this regard, the location close to existing and potential users of waste heat (for example) is considered to be appropriate, with such an energy from waste facility representing a sustainable solution supported by Strategic Policy 2 of the UDP (criteria (i)) which also has the potential to assist in the economic regeneration of the area.

Matters relating to the specifics of combined heat and power are addressed in greater detail below

- 2. The overall sustainability of the proposals, including consideration of the 'proximity principle'; Maximising opportunities for use of combined heat and power (CHP); and general matters relating to sustainability.**

Proximity Principle

In order to minimise transport of waste, any transport of waste materials should be as sustainable as possible, and should use environmentally friendly fuels and/or rail or water where possible. Any waste that cannot be beneficially recovered should be processed at the nearest suitable facility, a concept termed the 'proximity principle', which is explained in the Wales Waste Strategy.

The SEWRWP 1st review states that when deciding where to build waste management facilities two key principles will underpin the decision, the first of these being proximity – that they should be built as near as possible to the sources of the waste to limit their impact on the environment of transporting waste.

Within this context, the submissions advise (sourcing of material) that the biomass feedstock will be provided by existing recycling and waste wood processing operations within a 15 mile radius of the site under the terms of a fuel agreement. They advise that the 15 mile radius for fuel was determined on the basis that the applicant wishes to reduce vehicle miles for every load delivered to the site, rather than prohibit the use of the docks for loads arriving by sea from more than 15 miles away. Fuel providers within the 15 mile radius may therefore have a wider sphere of operation but the applicant wishes to encourage local re-use of wood for fuel, in contrast to the current situation where wood is travelling hundreds of miles for use as fuel for co-generation, some of which is imported.

From these submissions, it is evident that there is an intention for wood fuel to be primarily sourced from local suppliers. Nevertheless, there also remains a likelihood that such fuel would not solely be local, for example the submissions indicate that a minimum of 20,000 tonnes of wood would arrive by boat, which would clearly not fall within this 15-mile radius. The use of such boat deliveries would, however, reduce the amount of traffic on the highway network by over 1,333 vehicle movements, while in addition, the site is located in close proximity to the railway line that serves the operational port, and as such consideration will be given to the feasibility of accepting deliveries by rail in addition to boat in order to reduce vehicle numbers further, if unloading facilities are available at the dock for wood fuel.

Taking the above into account, and the intention to limit the impact of such plants on the environment of transporting waste, it is considered that the plant would satisfy the requirements of the proximity principle provided deliveries by road are limited to the stated 15-mile radius, with deliveries by sea or rail limited to those sourced from the UK.

Maximising Opportunities for Use of Combined Heat and Power (CHP)

With respect to Combined Heat and Power (CHP), TAN 8 (para 3.6) defines it as an installation where there is simultaneous generation of usable heat and power (usually electricity) in a single process. The basic elements of a CHP plant comprise one or more prime movers usually driving electrical generators, where the heat generated in the process is utilised via suitable heat recovery equipment for a variety of purposes including: industrial processes, community heating and space heating. CHP plant allows "waste" heat produced from electricity production through thermal processes to be put to valuable use thus providing an opportunity for significant savings in carbon emissions. Local planning authorities are advised to take an active role in facilitating CHP systems through development plan and development brief processes.

Following initial review, concerns were expressed that the proposal as submitted was not considered to represent a good quality form of CHP given the absence of a clear strategy / secure commitment for a significant proportion of the waste heat to be re-used in nearby buildings and facilities, or to form part of a planned introduction of the infrastructure required for such re-use.

For example, while the submissions state that the "location of the site makes the reuse of waste heat possible for commercial and domestic purposes", and that waste heat from the plant will heat the facilities on site, there was no secure commitment to this, nor any detail of a mechanism to achieve such re-use, which is considered to be essential to add to the justification for such a proposal.

In response, the applicant has stated that it is their intention to meet the requirements of DEFRA'S CHPQA Standard, which states that Good Quality CHP refers to CHP generation that is energy efficient in operation. The CHP Quality Assurance programme (CHPQA) launched in May 2000 determines that quality by providing a practical method for assessing all types and sizes of CHP scheme. It also states that "the development of CHP provides a particularly cost-effective approach for reducing CO2 emissions and will therefore play a crucial role in the UK Climate Change programme".

In response to discussions advising of the importance of CHP, the applicant has also advised that they would accept a planning condition securing a commitment to use waste heat from the process, with a similar condition imposed on a recent approval in Hull which required that "Prior to use of the approved energy plant commencing details of the means to generate energy and recover waste heat from the operation of the plant shall be submitted to and approved in writing by the Local Planning Authority....".

Similarly, they would accept a condition which refers to achievement of an attainable standard such as CHPQA, which they consider demonstrates a clear commitment to re-use waste heat which would also be enforceable.

With specific respect to the opportunities for CHP, it is notable that the site is located near to existing and prospective development, both industrial and residential, as well as other prospective users (the applicants have referred to the Dock Offices as being close enough to make use of the heat from the plant, which would help offset the Council's own carbon footprint). The application site is also very close to the Barry Waterfront development which is identified as one of WAG's Zero Carbon Development Masterplan sites 2007-11, and the applicant has advised that they have a letter of support from the consortium responsible for development at Barry Waterfront in terms of reuse of waste heat.

They also emphasise that the reuse of heat within the process to generate additional electricity, to condition the fuel and potential for evaporative chilling to cool the engine enclosure all contribute to the CHP designation of the plant, while the applicant is committed to undertaking research to maximise the energy potential of the plant throughout its lifetime.

The need to ensure the plant is a holistic CHP plant is not only emphasised by government guidance but also by the response of the Energy Manager, and it is clear that without re-use of the waste heat the sustainability credentials of the scheme would be compromised severely. Nevertheless, in this respect, it is considered that the applicant has now demonstrated a secure commitment to providing good quality combined heat and power, which can appropriately be conditioned through the need for submission of a detailed feasibility report (or similar) detailing best practicable efforts to achieve the standard and to make such waste heat available in the locality.

Accordingly, it is considered that the proposal would represent an appropriate and sustainable CHP plant which would meet National, Regional and local policy.

Waste Minimisation and Management:

The application has been accompanied by a 'Waste Audit and Facilities Strategy' which seeks to "estimate the type and quantity of waste likely to be produced during the life of the development and identification of waste management targets". The submissions advise that waste arising from the construction phase will be closely controlled, with any material arising from the excavation of existing concrete floor slabs taken off site to a materials recycling facility for recycling if it cannot be reused on site.

Such matters can be appropriately conditioned to ensure compliance with such submissions.

Additional Sustainability Matters

The application has been accompanied by the required sustainability assessment which covers not only the sustainability credentials of the process itself, but also the sustainability of matters such as its location and design.

In summary, the proposals demonstrate a high level of sustainability insofar as:

- The site is a preferred brown field site, allowing a cost effective / existing connection to the National Grid.
- The site has availability of fuel supply, including the potential for 20 % to be delivered by boat via the port.
- The site is accessible to local services and public transport routes (bus and rail), with reasonable highway accessibility.
- The location of the site makes the reuse of waste heat possible for commercial and domestic purposes. The 23 industrial units adjacent to the site and the proposed Barry Waterfront Development could benefit from the waste heat.
- The building will not require heating as the heat produced by the process will ensure that no additional heating is required.
- Where possible, materials will be selected which have low embodied energy, and timber used on site will be sourced from sustainably managed forests.
- The scheme will use a sustainable drainage system, incorporating sustainable drainage measures such as soakaways; Permeable Surfacing Materials; and rainwater harvesting.

- Waste arising from the construction phase will be closely controlled. Any material arising from the excavation of existing concrete floor slabs will be taken off site to a materials recycling facility for recycling if it cannot be reused on site.

As a consequence of the above, it is concluded that, in addition to the sustainability credentials of the process itself, as described above, the location and site/ building would meet the Council's and national aspirations for development to embody high levels of sustainability.

3. Impact on Local / Residential Amenity.

The application site is located no greater than 250 metres from the existing residential properties on Dock View Road which overlook the site from an elevated height, with such proximity having raised many concerns from interested locals concerned about the impact of the proposed use on their amenities.

Such matters are addressed below, with specific consideration given to the following:

- Proximity to local residential properties
- Noise
- Air Quality
- Dust
- Odour
- Traffic Impact
- Visual Impact

Proximity to Local Residential Properties

As discussed above, the choice of location is considered acceptable in land use terms, albeit there is a clear policy requirement (primarily Policies WAST2 and ENV27) to ensure that any such development would not (amongst many other things) unacceptably affect residential amenity or pose a threat to public health.

As expanded upon below, it is considered that the proximity of the site, coupled with the appropriate controls and mitigation measures, ensure that there would be no demonstrable harm to local residential amenity, such that refusal would be warranted.

Noise Issues

The applicant advises that the plant has been designed to meet the BAT (Best Available Technology) requirements of the Environmental Permitting regime, which include noise emissions controls. The gas engines produce the most noise, hence their enclosure within an acoustically screened compound within the building.

The application has been supported by an Acoustics Report from AB Acoustics to consider the impact of the proposal, particularly on current and prospective residential units around the locality (e.g. Dock View Road, Cory Way / East Quay site; Cei Dafydd). On request, this has been supplemented by a report considering the in-combination effects of this plant with the nearby proposals for a waste to energy plant for non-hazardous waste (ref: 2009/00021/FUL refers).

The Environmental Health (Pollution Control) section has considered the submitted noise assessment and notes that the modelled sensitive locations have been chosen in consultation with the Pollution Team, on the basis of existing and currently proposed residential development. While noting that the original acoustic assessment has been based on an maximum internal noise climate of 90dBA (its conclusion relying on this being achieved), the in-combination supplementary report recommends that the external level could be reduced by either reducing the internal level within the plant to 85 dBA (rather than the 90 dBA suggested in the report dated 23 December 2009) or by increasing the attenuation offered by the building envelope. If a 5 dBA increase in attenuation is achieved then the increase in noise level from both plants will be below that which is considered to be of *marginal significance* with respect to BS 4142.

Given the conclusion of these reports, the EHO confirms that he has no objections, providing a condition is imposed that limits the internal acoustic environment to a maximum of 85 dBA. In addition, conditions are needed to ensure that building doorways / openings in frequent use do not face sensitive locations, that such openings remain closed except when receiving deliveries, and that operators of mobile plant within and outside the facility use reversing safeguards that have low off site impact (e.g. bleeper alarms are omni-directional and can be audible over some great distance and thus avoided).

Given the relative proximity of the site to residential properties, and the undoubted concerns expressed by many of the residents, it is considered prudent to require submission of a Construction Environmental Management Plan (CEMP) via condition to cover noise, including matters such as hours and delivery times, during the construction phase.

Air Quality

On request the application has been accompanied by an Air Quality Assessment, while emissions data has been included in the case studies enclosed with the application. As for the noise issues above, this has been supplemented by a report considering the in-combination effects of this plant with the nearby proposals for a waste to energy plant for non-hazardous waste (app. Ref 2009/00021/FUL refers).

The applicants advise that the proposal will not impact upon local air quality because its emissions must meet the limits set in the Environmental Permit. In this respect, they add that gaining a planning consent does not authorise the operation, it must still have a permit and agreed abatement technology before it can operate. Not only does the plant have to meet strict emission criteria it must also be the Best Available Technology (BAT) for the use.

As part of the permit application process the Environment Agency will assess the emissions modelling carried out and set emission limits for the process. Modelling has already been carried out by RSK on behalf of the applicant which concluded that the air quality impact of the site operation was not significant. The emissions limits used for the modelling were in line with the Waste Incineration Directive limits which would be set by the Environment Agency.

The submissions also emphasise that the proposed biomass plant is not a mass burn process which results in large volumes of emissions at the stack which require abatement, rather that by the time the gas reaches the engines it has to be clean to ensure that the engines operate efficiently. In other words, the stack (exhaust) will have no visible air emissions as particulates will be controlled using the abatement equipment agreed with the Environment Agency. For example, the process does not use hot water to produce steam and all water involved in the cooling process will go to sewer.

In essence, the technology used is modern and is not a traditional 'incineration', but rather a gasification process which breaks down the fuel into a gas which drives an engine to create electricity, with the stack acting as an 'exhaust' rather than a traditional flue.

On request, the applicant has provided the following comparative analysis with respect to the emission of Nitrous Oxides and Carbon Monoxide from the stack: -

"If a heavy goods operator has 20 vehicles running a 12 hour working day, 365 days per year, that business would give rise to the same emissions as the Biomass Plant's maximum output per annum. However, the HGVs would be using fossil fuels rather than renewable wood fuel. This comparison uses the average speed figure of 30mph for the vehicles used by the operator, which is likely for a skip vehicle or delivery vehicle".

This comparison is considered to demonstrate that such emissions are relatively minor when compared with the type of development being proposed. In assessing such matters, it is noted that many of the concerns expressed by local residents concern the type of wood which would be burnt by the plant and the impact on local air quality as a result. The application has made it clear, however, that the wood to be processed must meet a uniform specification for effective gas production (i.e. a moisture content of 10% after drying, free of contamination from litter, metals etc.). Moreover, they submit that only 2 timber treatments are classed as hazardous, namely: Chromated Copper Arsenate (CCA) and Croesote, both of which are now restricted, while their fuel supply agreements would state that CCA or creosote treated timber or any timber classified as hazardous within the definition of the Hazardous Waste (England & Wales) Regulations 2005 must not be processed and supplied as a feedstock. In this regard, there is also a 'Duty of Care' set out in Section 34 of the Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) Regulations 1991.

The EHO has also considered the submitted assessment in detail and has concluded that, while any process of this kind will generate emissions to atmosphere, the key issue is to assess whether these emissions significantly impact upon health or the environment both in the immediate vicinity and further afield.

In this respect, he notes that quantities of some emissions may already be present in the local environment, for example, existing industry or road traffic, while other emissions are generated only from this type of process. He has confirmed, however, that he is satisfied that the steps and inputs to the submitted model are logical and comprehensive taking into account any known local air quality, meteorological and topographical issues, and notes that the detailed assessment model considered each scenario and has concluded that the common emissions – specifically Particulate Matter (PM10), Nitrogen dioxide, Sulphur dioxide and Carbon monoxide - do not contravene statutory human health objectives. The stack height has also been determined on the basis of this assessment to ensure adequate dispersion.

The submitted comparison of Nitrous Oxides and Carbon Monoxide also demonstrates that the emissions from the stack in comparison with the movement of heavy goods vehicles is relatively small when compared to the nature of the operation, while the applicants also make the good point that the emissions from the plant use renewable fuel as opposed to fossil fuels used by vehicles.

In addition, the Environment Agency has advised that the information provided by the applicants "*shows a good understanding of potential air impacts to the local environment*", which will be considered in more detail at the time of the application made under the Environmental Permitting (England & Wales) Regulation 2007, at which time the Agency would carry out an appropriate assessment of the environmental impacts to all media of this process, together with an in-combination effects from other EPR licences when determining a permit.

Accordingly, there are not considered to be any sustainable objections in respect of the impact on local air quality which would justify refusal of this application on such grounds.

Dust

As for any industrial process, there is an opportunity for dust to create a nuisance in the local area unless adequately controlled. In this respect, the applicants have advised that site operations will be carried out to minimise the creation of dust, with a permanent constant mains water supply available in all climatic conditions to ensure that dust suppression systems can function effectively, with all external water pipes lagged to prevent frost damage during Winter months. In addition, dust in the hopper and conveyor area will be controlled using a hand held water hose or vacuum extraction system.

They advise that water sprays and/or bowsers will be used to reduce dust levels on all external site surfaces where necessary; that vehicles carrying potentially dusty loads off site will be securely sheeted or sprayed with water to reduce dust emissions; and that site staff will continuously monitor dust emissions whilst the plant is in operation and take appropriate action when required.

Subject to conditions covering such dust control measures, there are not considered to be any adverse impacts on local area by reason of dust generation.

Odour

The submissions advise that no material will be accepted which is likely to cause an odour nuisance, and that any loads which are malodorous will be rejected and the Environment Agency informed. They also state that the Biomass plant itself does not produce odorous emissions.

No objections have been raised by the EHO or EAW in respect of prospective odour nuisance.

Traffic Impact

The amount of traffic generated by this process, in comparison with the existing local and industrial traffic on the network (particularly Fford-y-Milleniwm) is not considered to be great, and in this respect there are not considered to be any substantive reasons to object to the proposal on the grounds that there would be an unacceptable increase in noise or activities from lorry movements, not least because the site is located in an industrial area (notwithstanding proximity to dwellings) where such activities are not uncommon.

Visual Impact

Residents concerns in respect of the visual impact of the scheme are addressed below.

Conclusions

While it is acknowledged that there is a considerable degree of unrest over the nature of these proposals and the impact on the local community, for the reasons given above it is concluded that there are no overriding objections to the development which could be substantiated on grounds relating to local residential amenity.

In addition, the location of the site, and the heavy support for such sustainable proposals from national, regional and local policy, is such that the planning balance is considered to be in favour of approving such facilities where no such harm is identified.

4. Visual Impact / Design.

The application site is located to the immediate east of the industrial/ commercial units within the old Nissen huts on Woodham Road, and has most recently been occupied by an industrial use with storage containers etc. (such use having recently been cleared).

The site is clearly visible from Fford y Milleniwm and higher ground (Dock View Road etc) to the north, and (up close and at a distance) from Barry Island and the Waterfront in general to the west, as well as generally from the Docks. Nevertheless, in terms of its wider context, it clearly relates primarily to the wider industrialised area of Barry Docks.

As a consequence, the proposed industrial building, while some 14 metres tall, would nevertheless relate to the character of nearby use and buildings, and have no adverse visual impact on the amenity of the locality. Indeed, the only element of the proposal which distinguishes it from any other large industrial building is the proposed 20m (possibly, 16m) high stack. Within its industrial context, however, this would similarly have no adverse impact, appearing neither unacceptably prominent or out of character.

While it is appreciated that the Docks are overlooked by houses from an elevated height in and around Dock View Road – with the visual impact of the proposal on residential amenity having been raised in local representations, including matters relating to the impact on or loss of view - the area is indisputably industrialised in character and the addition of a new industrial building would, within this context, not appear out of place.

In addition, the industrial process would take place entirely within the building, other than the delivery/ off loading of timber (which would be to the southern side of the building, and therefore primarily screened from views from the north) and the majority of the site would be open/ landscaped.

Conditions would be required on matters including materials, landscaping, no open storage, and external lighting (of site and building).

For those reasons discussed in greater detail above, it is thus considered that the physical impact of the use and building would neither appear out of character or unacceptably overbearing to the extent that it would cause demonstrable harm to the amenities of those residential properties living near the area. Accordingly, it is concluded that the proposal would not have any unacceptable visual impact, and would accord with the objectives of the policies listed in the policy section above, including WAST2, ENV27, COMM8, EMP2 and EMP3.

5. Traffic Management / Access.

The application has been accompanied by a Transport Assessment and a Green Travel Plan (GTP), with the Transport assessment (and accompanying Planning Statement) advising as follows:

- Eight new local employees will be based at the plant
- The plant has a maximum fuel requirement of 216 tonnes per day, and the loading bay within the building will have up to 3 days' storage capacity (approximately 650 tonnes) to ensure constant availability of fuel.
- The additional 3 days' storage capacity will be built up during commissioning and will be topped up by an additional 2 loads per day over a month long period after which movements will reduce to normal.
- Based upon calculations relating to the bulk density of wood and varying HGV lorry payloads (walking floor trailers - 20 to 25 tonnes per load used) the likely deliveries to the plant will be between 9 and 11 loads per day, generating a total of 22 movements
- The site will only receive deliveries of fuel and visits from third parties and the public during the following hours: (planning statement refers)
 - Monday to Friday 07:00 - 19:00
 - Saturday 07:00 - 19:00
 - Sunday / Bank / Public Holidays 07:00 - 16:00
- The number of loads quoted also include the removal of materials off site as return loads, to maximise haulage efficiency.
- The site gates will be closed to vehicular access outside these hours with only authorised personnel on site to open the gates for emergency and regulatory access.

The planning statement also advises that the applicant has agreed to unload a minimum of 20,000 tonnes of wood by boat at the dock facility (such loads likely to contain 3 days' fuel), which will save over 1,333 vehicle movements, although this is actually between 800-1000 (one way movements) based upon the TA calculations above (20-25 tonnes per lorry). The extent to which deliveries by boat will occur, however, and the source of such fuel (which would be expected not to be 'local') is such that the highway impact should be assessed on its own. In this respect, the TA states that it is likely that there will be periods when dockside deliveries do not occur, leaving the figures above unchanged.

The TA concludes that the surrounding road network has sufficient capacity to meet the movements associated with the proposal.

These submissions have been considered by the Highway Engineers, who have concluded that the trip generation relating to Barry Docks is minimal, and that Barry Docks has good links to the surrounding highway network and the motorway network further afield, with the highway network already designed to take such large HGV's.

Accordingly, and given the 12 hour delivery periods involved, they consider the small amount of additional trips generated by the proposal would not create any problems to the adopted highway network, such that the Highways Authority has no objection to the proposals.

They also consider that the application at Atlantic Way (ref. PA 09/00021/FUL) in combination with this application will not have a detrimental affect on the public highway.

Green Travel Plan

The Green Travel Plan notes that eight new local employees will be based at the plant, with adequate parking provided for vehicles and cycles.

The overall target of the GTP is stated as being "to promote, encourage and facilitate alternative travel where possible", with the GTP "designed to reflect the company's awareness of its need to promote sustainable travel, and its responsibility in reducing the impact on the local and wider environment... as a renewable energy organisation it is of key strategic importance to maintain sustainable activities where possible, and to minimise the environmental impact created by any part of daily working operations". The GTP includes measures aimed at encouraging use of public transport, cycling, walking, and car sharing, including provision of information through induction packs, provision of free equipment, an assigned GTP co-ordinator; and regular monitoring and review;

The submission of a GTP is welcomed, and would have been required by condition in any event, in order to encourage modal shift towards more sustainable modes of travel. Compliance with the GTP will be conditioned, as will the provision of appropriate secure cycle parking facilities for employees. This will be supplemented by legal agreement relating to sustainable transport contributions.

6. Other Material Considerations.

Handling of Waste Outputs

As a result of the process, the main waste emission (requiring disposal/ handling) would be ash/char (45.36 tonnes per annum), with less than one tonne pa of other matters such as condensate, filtration solids similar to ash, stem/heat, and exhaust gases.

In order to control the disposal of such waste from the site, a methodology statement condition is recommended which would cover any required storage and subsequent disposal, and also cover matters (if deemed necessary) such as the use of dust sheeting on lorries etc.

Contaminated Land

The application has been accompanied by a standard environmental report, but the EHO advises that a full assessment is still required with regard to contaminated land, which should follow the procedures set out in Land Contamination: A Guide for developers from the WLGA and EAW.

In this respect, the EHO has suggested the need for a condition requiring a contaminated land assessment and associated remedial strategy to be submitted to and approved by the Local Planning Authority.

Cumulative Impacts with Other Development

As advised above, Members will be aware that an application is currently being considered on land accessed off of Atlantic Way within Barry Docks, Barry for the "Change of use from B2 - General Industrial Use to Sui Generis - Waste Use which would include operational development in the form of the construction of a gasification waste to energy plant for non-hazardous waste (app. Ref 2009/00021/FUL)".

This application is yet to be reported to Planning Committee, but in brief it proposes an Energy Recovery Facility which would process approximately 80,000 tonnes of residual waste per annum to create approximately 7.5 MWe renewable energy for transfer to the National Grid.

On request, the applicants have submitted additional supporting documentation covering in-combination effects relating to air quality and noise, which has been assessed by the Council's EHO, who is satisfied that there are no reasonable grounds to object.

While the planning merits of the above application by Biogen Power will, of course, be considered separately, nevertheless it is considered that individually or cumulatively, the current proposal has satisfactorily demonstrated that it would not cause unacceptable effects on local residents.

Environmental Permitting Programme

The Environmental Permitting Programme (EPP) is a major DEFRA, Environment Agency and Welsh Assembly Government initiative that has created a single more user-friendly and modern permitting and compliance system for Waste Management Licensing and Pollution Prevention and Control. The application for the permit is a comprehensive process which requires the submission of detailed information on all emissions to air, water or land which will be regulated by the imposition of conditions in the permit.

At the time of such an application, it has to be demonstrated that the techniques employed are the Best Available Techniques (BAT), with such submissions subject to a period of public consultation, including consultation with public bodies such as the Local Authority, the Local Health Board and Countryside Commission for Wales.

For Member's information, similar plant to that subject to this application have been approved for 3 sites incorporating the technology at Tythegston Landfill and Capital Valley in South Wales and Hooton on the Wirral. The two Welsh sites have been built and have permit applications before the EA, with the issue of both permits expected shortly. The sites are larger than this proposal. The applicants advise that the technology has met the BAT (Best Available Technology) requirements of the permitting regime.

Land Contamination Issues

The applicant requests that such matters be governed by condition requiring a contamination survey (due to current restrictions on access to the land), such survey to inform any mitigation measures necessary. This is considered to be satisfactory, given that there are no known serious contamination issues on the site, and that the EAW are satisfied in this respect.

Archaeology

In commenting on the Environmental Impact screening opinion, Glamorgan Gwent Archaeological Trust advised that there is not an archaeological restraint to the proposed development and that they will not be seeking any additional information on the archaeological resource prior to the determination of the application. Accordingly there are no archaeological constraints to the application.

Flood Risk / Water Resources

The EAW has advised that the development is not within a fluvial floodplain and that they have no record or awareness of any flooding having occurred to the site. The site lies entirely within Zone B, as defined by the Development Advice Maps (DAM) referred to by TAN 15 Flood Risk, but the EAW have no adverse comment to make.

The controlled waters at this site are considered to be of low environmental sensitivity, and therefore the EAW have not provided any site-specific advice with regards to land contamination, while Welsh Water has raised no objections to the development subject to conditions with regard to sewerage and surface water discharges.

Accordingly, there are no matters of concern with respect to flood risk / water resources (Policy ENV7 refers).

Community Engagement

Paragraph 2.15 in TAN 8 'Planning for Renewable Energy' states that developers should take an active role in engaging the local community on renewable energy proposals.

This application has generated a significant degree of public interest, particularly due to its proximity to residential properties, and was not preceded by any engagement with the local community on behalf of the developers.

Although not facilitated or attended by the Planning Department, as the determining authority, nevertheless the applicant was encouraged to engage with the local community to explain the processes and impacts associated with this renewable energy scheme, and accordingly they recently arranged a public meeting at the Mount Sorrell Hotel 15 April 2009 to explain their proposals in greater detail. No details of this meeting have been submitted at the time of writing, but will be reported to Members if made available prior to the date of Committee.

Ecology

Following concerns expressed by the Ecology Officer the applicants have undertaken a survey which shows that no *Althaea* or superficially similar species of the Malvaceae were recorded in this survey, and concludes that the failure to find *Althaea* or similar malvaceous species, considered together with the strongly ruderal character of the site and the lack of previous records, make it very unlikely that *Althaea hirsuta* (Rough Marsh-mallow) is present.

CCW have considered and welcomed this report, and advised that they do not believe that the presence of the plant on site would prevent the development from taking place. However, rough marsh-mallow is a locally important plant in the Vale of Glamorgan. CCW therefore recommend that a suitable area within the development be identified as a potential receptor site for the plant. The site should be searched at an appropriate time of year and any individuals found be relocated to the aforementioned site.

Such matters can be appropriately conditioned, and accordingly there are no ecological objections to the proposals, which satisfies Policy ENV16 of the adopted UDP.

Employment

The applicants advise that the installation of the new Biomass plant is amongst the first of its kind in the UK and will result in the generation of a minimum of 8 local jobs based at the site, with other spin offs in the supply / delivery chain.

Although this is not a considerable employment generating use (as identified by some representations), nevertheless it is still considered to be a use appropriate to its location within an existing employment area/ dockland, with an opportunity for local jobs during construction and operation, as well as in the supply chain.

Educational Opportunities

The applicants advise that the site will provide a local source of renewable energy and will be available by appointment to members of the public and educational bodies to view the facility to enhance public knowledge of recycling and Biomass energy production.

It is considered that any opportunity to raise awareness of sustainable waste management should be explored, as well as providing a valuable local resource and developing links with the community, which could also assist in dispelling any controversy over such facilities. In this respect, the applicants will be encouraged to actively 'market' the opportunity to local schools etc.

Section 106 Requirements

The applicant has confirmed their acceptance of the following through a unilateral obligation under Section 106 of the Planning Act 1990 (as amended):

Sustainable Transport – Local and National Planning Policies emphasise the need for new developments to be accessible by modes of travel other than the private car. This is particularly important for new employment uses which can generate a significant number of people movements at peak times. Therefore, it is reasonable to expect the developer to pay a financial contribution to improve sustainable transport facilities serving the site. In this case, a contribution of £10,000 is considered reasonable given the scale and form of development, and having regard to the Council's approach to such matters throughout the Vale of Glamorgan.

Public Art – The Council has a 'percent for art' policy which is supported by the Council's adopted supplementary planning guidance on Public Art. On major developments, developers are required to set aside a minimum of 1% of their project budget specifically for the commissioning of art and, as a rule, public art should be provided on site integral to the development proposal.

For this development, this will equate to the sum £7,500, which the applicants have stated would be utilised through the commissioning of a biomass related sign/sculpture fashioned from local wood, agreed with the LPA, using the services of a local artist. The artist's quotation and proof of payment for the work will also be copied to the LPA as part of the UU.

CONCLUSION

The decision to recommend planning permission has been taken in accordance with Section 38 of The Planning and Compulsory Purchase Act 2004, which requires that, in determining a planning application the determination must be in accordance with the Development Plan unless material considerations indicate otherwise. The Development Plan comprises the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011.

Having regard to National and Regional Policies on Waste and Renewable Energy, and Policies 13, WAST1, WAST2, COMM8, ENV6, ENV7, ENV16, ENV18, ENV26, ENV27, ENV29, EMP2, EMP3, TRAN 10 and TRAN 11 of the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011, it is concluded that the proposal would represent a sustainable, renewable energy proposal, which meets the above policies, while also satisfactorily protecting the interests of local residential and visual amenity, and highway safety, while not compromising other material considerations detailed in the accompanying report.

RECOMMENDATION

Subject to the interested person first entering into a Section 106 Legal Agreement to include the following necessary planning obligations:

- (a) The developer will provide public art on site to a value of at least 1% of the build costs (£7,500) of the development or provide a financial contribution to the same value in lieu of on site provision for the Council's public art fund.

- (b) The developer shall pay the sum of ten thousand pounds (£10,000) to provide or enhance Sustainable Transport Facilities serving the Site; and
- (c) The Legal Agreement will include the standard clause requiring the payment of a fee set at 20% of the value of the planning application fee (£2,275 in this case).

APPROVE subject to the following condition(s):

1. The development hereby permitted shall be begun before the expiration of five years from the date of this permission.

Reason:

To comply with the requirements of Section 91 of the Town and Country Planning Act 1990.

2. The total tonnage of wood waste treated at the plant hereby approved shall not exceed 72,000 tonnes per annum, unless otherwise agreed in writing with the Local Planning Authority beforehand, and records of the amount of fuel processed shall be retained and made available to the Local Planning Authority on request.

Reason:

To ensure accordance with the terms of the application, to limit the impact of activities on the immediate area, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

3. The plant hereby approved shall only process wood fuel as described in the supporting submissions (clean wood, pallets, construction timber and other woods which have been removed from the construction and demolition waste stream locally).

Reason:

In the interests of local amenity, given that the technical equipment is capable of processing alternative fuels, the impact of which has not been considered through the environmental submission accompanying this application, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

4. The wood fuel received for processing at the plant shall be restricted to waste arising within the South East Wales Region (covered by the regional Waste Plan), other than deliveries received by boat or rail, which shall be restricted to deliveries from within the United Kingdom, and shall not process 'virgin' or 'non-waste' wood unless otherwise agreed in writing by the Local Planning Authority.

Reason:

To ensure the facility serves the waste disposal needs of the Region, complies with the proximity principle, and to ensure compliance with Policy WAST2 of the Unitary Development Plan.

5. Before the development hereby permitted is brought into operation a methodology for the management of the Biomass process waste and general refuse, to include details of the facilities for the storage on site and the subsequent disposal from the site of the Biomass waste and general refuse (including any necessary mitigation to prevent nuisance), shall be submitted to and approved in writing by the Local Planning Authority. The disposal of waste resulting from the operation of the plant shall thereafter be undertaken in accordance with the agreed methodology unless otherwise approved in writing by the Local Planning Authority.

Reason:

In order to ensure the disposal of waste from the site without harm to local amenity, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

6. The plant hereby approved shall not be brought into use until such time as a detailed feasibility study and associated implementation plan (where practicable) has been submitted to and approved in writing by the Local Planning Authority, detailing best practicable efforts to recover waste heat and make such heat available to buildings / sites in the locality, and to attain Combined Heat and Power Quality assurance (CHPQA). Such approved plan shall thereafter be annually reviewed during the first 10 years of the plant's operation, and the Local Planning Authority informed in writing of the amount of waste heat utilised (and how) and of the status of continuing and proposed efforts to make best use of such waste heat.

Reason:

In order to demonstrate a clear and continuing commitment to the provision of Good Quality Combined Heat and Power, in order to meet national, regional and local policy.

7. Deliveries to the site, and all other external operations, shall be restricted to the following hours: - Monday to Saturday : 07:00 - 19:00; and Sunday /Bank/Public holidays 08:00 - 16:00.

Reason:

In the interests of local residential amenity, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

8. The internal plant noise shall be restricted to a maximum of 85 dBA to include a 5 dBA tonal penalty (with every opportunity to reduce this level explored and demonstrated prior to final construction) and a report shall be submitted within one month of the plant commencing operation to demonstrate compliance with such restrictions.

Reason:

In the interests of local residential amenity, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

9. Prior to their use in the construction of the building hereby approved, full details of the external facing materials to be used in the development, to include colour of the building and stack, and confirmation of the acoustic properties of the chosen materials, shall be submitted to and approved in writing by the Local Planning Authority and the development shall thereafter be carried out and retained in accordance with the approved details, unless otherwise approved in writing by the Local Planning Authority.

Reason:

In the interests of local visual and residential amenity, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

10. No development approved by this permission shall be commenced until a contaminated land assessment and associated remedial strategy have been submitted to and approved by the Local Planning Authority. The assessment shall contain the following elements and follow the guidance contained in 'Contaminated Land: A Guide for Developers' available from the Local Planning Authority:
 - a) A Phase I Preliminary Risk Assessment (Desk Study) to be submitted to the Local Planning Authority for approval. The desk study shall detail the history of the site uses and identify and evaluate all potential sources and impacts of land and/or groundwater contamination.
 - b) Where the preliminary risk assessment identifies potentially unacceptable risks at the site, a suitably qualified and accredited person shall carry out a site investigation, including relevant soil, soil-gas, surface and groundwater sampling in accordance with a quality assured sampling and analysis methodology. The requirements of the Local Planning Authority shall be fully established before any site surveys are commenced.

- c) A site investigation report detailing all investigative works and sampling on site, together with the results of any analysis, risk assessment to any receptors and a proposed remediation strategy shall be submitted to the Local Planning Authority. The Local Planning Authority shall approve any such remedial works as required, prior to any remediation commencing on site. The works shall be of such a nature as to render harmless the identified contamination given the proposed end-use of the site and surrounding environment including any controlled waters.
- d) The approved remediation works shall be carried out in full on site under a quality assurance scheme to demonstrate compliance with the proposed methodology and best practice guidance. If during the works contamination is encountered which has not previously been identified then the additional contamination shall be fully assessed and an appropriate remediation scheme agreed with the Local Planning Authority.
- e) Upon completion of the works, this condition shall not be discharged until a verification report has been submitted to and approved by the Local Planning Authority. The verification report shall include details of the completed remediation works and include quality assurance certificates to show that the works have been carried out in full and in accordance with the approved methodology. Details of any post-remedial sampling and analysis to show the site has reached the required clean-up criteria shall be included in the verification report together with the necessary documentation detailing what waste materials have been removed from the site.

Reason:

In the interests of public safety, and to ensure compliance with Policy ENV7 of the Unitary Development Plan.

- 11. Details of a scheme to identify how the warning signal emitted by reversing vehicles can be controlled, and noise impact to nearby residential properties minimised, shall be submitted to and approved in writing by the Local Planning Authority prior to deliveries commencing to the facility hereby approved. Deliveries shall thereafter be undertaken in full accordance with such agreed scheme, unless otherwise approved in writing by the Local Planning Authority.

Reason:

In the interests of local residential amenity, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

12. The roller shutter doors in the south-facing elevation of the building shall be kept closed at all times other than when deliveries are being received.

Reason:

In the interests of local amenity, and to comply with the recommendations for noise transmission contained within the supporting noise report, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

13. Notwithstanding the submitted plans, the building shall not incorporate rooflights at the time of construction, nor shall any additional openings be created in the building hereby approved without first receiving the prior written consent of the Local Planning Authority.

Reason:

In the interests of local amenity, and to comply with the recommendations for noise transmission contained within the supporting noise report, and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

14. The 2.4 metre high steel palisade security fencing approved for the boundaries of the site shall be provided with a powder-coated (or similar) finish, details of which shall first have been submitted to and approved in writing by the Local Planning Authority.

Reason:

In the interests of visual amenity, and to ensure compliance with and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

15. There shall be no open storage of materials of any kind outside any building on the site unless otherwise agreed in writing by the Local Planning Authority.

Reason:

In the interests of local visual amenity, and to ensure compliance with the terms of Policy ENV27 of the Unitary Development Plan.

16. Prior to the facility being brought into beneficial use, details of a scheme to control dust within the site and locality shall be submitted to and approved in writing by the Local Planning Authority. The operation of the plant shall thereafter be in accordance with the approved details unless otherwise approved in writing by the Local Planning Authority.

Reason:

In the interests of local amenity, and to ensure compliance with the terms of Policy ENV27 of the Unitary Development Plan.

17. Prior to their construction / installation / use on site, details of all external lighting of the building and site, to include specification, means of operation (whether permanent or sensor/security lights, and hours of operation), and lux plots to prevent / minimise light spillage outside of the site (including atmospheric light pollution) shall be submitted to and approved in writing by the Local Planning Authority. All lighting shall be implemented in accordance with such approved scheme and thereafter retained as approved, unless otherwise approved in writing by the Local Planning Authority.

Reason:

In the interests of residential and visual amenity, and to ensure compliance with and to ensure compliance with Policies WAST2, EMP2, EMP3, ENV27 and ENV29 of the Unitary Development Plan.

18. Prior to their use / construction in the development hereby permitted, full details of the proposed sustainable drainage system, which shall incorporate sustainable drainage measures such as soakaways; Permeable Surfacing Materials; and rainwater harvesting, as stated in the appellants supporting sustainability submissions, shall be submitted to and approved in writing by the Local Planning Authority. The approved measures shall be implemented in full prior to the plant being brought into beneficial use.

Reason:

To ensure that the development is serviced by an appropriate Sustainable Urban Drainage Scheme, and to ensure compliance with the terms of Policies ENV7 and ENV27 of the Unitary Development Plan.

19. Foul water and surface water discharges shall be drained separately from the site, with no surface water or land drainage run-off allowed to connect (either directly or indirectly) into the public sewerage system.

Reason:

To protect the integrity, and prevent hydraulic overloading, of the Public Sewerage System, and to ensure compliance with the terms of Policy ENV27 of the Unitary Development Plan.

20. Full details of hard and soft landscaping for the whole of the site not covered by the building, to include new tree planting, and layout and surface materials for car parking, other vehicle and pedestrian access and circulation areas; shall be submitted to and approved in writing by the Local Planning Authority, and these works shall be implemented as approved.

Reason:

To safeguard local visual amenities, and to ensure compliance with the terms of Policy ENV27 of the Unitary Development Plan.

21. All planting, seeding or turfing comprised in the approved details of landscaping shall be carried out in the first planting and seeding seasons following the plant being brought into beneficial use, and any trees or plants which within a period of five years from the completion of the development die, are removed or become seriously damaged or diseased shall be replaced in the next planting season with others of similar size and species, unless the Local Planning Authority gives written consent to any variation.

Reason:

To ensure satisfactory maintenance of the landscaped area to ensure compliance with Policies ENV11 and ENV27 of the Unitary Development Plan.

22. The landscaping details required by Condition No. 19 above shall provide for a suitable area within the development to be identified as a potential receptor site for *Althaea Hirsuta* (Rough Marsh-mallow), with the site searched during the first season (appropriate time of year) after commencement of development for any existing plants, and any individuals found relocated to the approved site, with details of such survey/ relocation work provided to the Local Planning Authority.

Reason:

In the interests of ecology and to ensure compliance with Policy ENV17 of the Unitary Development Plan.

23. Prior to the construction of any buildings, a scheme for the eradication of Japanese Knotweed on the site shall be implemented in accordance with a scheme which shall have first been submitted to and agreed in writing by the Local Planning Authority.

Reason:

In the interests of ecology and to ensure compliance with Policy ENV17 of the Unitary Development Plan.

24. Notwithstanding the submitted site layout plan, an amended plan with full details of the means of enclosure to the front boundary with Woodham Road, and forecourt area, shall be submitted to satisfy the following highway requirements: -

- i) The boundary fence shall be set back a minimum of 4.0m from the carriageway edge to allow for adequate visibility splays from the proposed access and to maintain visibility from the existing Woodham Road junction.
- ii) Visibility splays of 4.0m x 70.0m in both directions, measured from the centre line of the proposed access shall be provided.
- iii) Provision of a hard surface of concrete or bituminous material for a minimum distance of 6.0m from the highway boundary.
- iv) Parking for 2 No. HGVs, in addition to 6 car parking spaces
- v) A manoeuvring area, to enable all vehicles to enter and leave in a forward gear at all times, which shall be kept free of obstruction at all times.
- vi) Gates, if provided, that shall not open outwards and shall be set back a minimum of 6.0m from the carriageway edge.

The development shall be undertaken and thereafter retained in full accordance with such approved details unless otherwise approved in writing by the Local Planning Authority.

Reason:

In the interests of highway safety, and to ensure compliance with the terms of Policy ENV27 of the Unitary Development Plan.

25. Details of secure parking on site for cycles shall be submitted to and approved in writing by the Local Planning Authority and the approved scheme of cycle parking shall be fully implemented on site prior to the first beneficial occupation of the development hereby approved and shall thereafter be so retained at all times.

Reason:

To ensure that satisfactory parking for cycles is provided on site to serve the development, and to ensure compliance with the terms of Policy ENV27 of the Unitary Development Plan.

26. Prior to the commencement of development, a Construction Environmental Management Plan shall be submitted to and agreed in writing by the Local Planning Authority, such plan including details of working hours and delivery times; dust suppression; temporary lighting etc., during the construction phase.

Reason:

To protect the amenities of nearby residents, and to ensure compliance with the terms of Policy ENV27 of the Unitary Development Plan.

27. The measures incorporated into the Green Travel Plan accompanying the application, which aims to widen travel choices by all modes of transport, encourage sustainable transport and cut unnecessary car use, shall be implemented in full at the time of the development being brought into beneficial use, and thereafter monitored and reviewed in accordance with the approved plan.

Reason:

To ensure the development accords with sustainability principles and the site is accessible by a range of modes of transport in accordance with Policies 2, 8, ENV27 and TRAN9 of the Unitary Development Plan.

NOTE:

Please note that this consent is specific to the plans and particulars approved as part of the application. Any departure from the approved plans will constitute unauthorised development and may be liable to enforcement action. You (or any subsequent developer) should advise the Council of any actual or proposed variations from the approved plans immediately so that you can be advised how to best resolve the matter.

In addition, any conditions that the Council has imposed on this consent will be listed above and should be read carefully. It is your (or any subsequent developers) responsibility to ensure that the terms of all conditions are met in full at the appropriate time (as outlined in the specific condition).

The commencement of development without firstly meeting in full the terms of any conditions that require the submission of details prior to the commencement of development will constitute unauthorised development. This will necessitate the submission of a further application to retain the unauthorised development and may render you liable to formal enforcement action.

Failure on the part of the developer to observe the requirements of any other conditions could result in the Council pursuing formal enforcement action in the form of a Breach of Condition Notice.



Appendix 7

Decision Notice on application

no. 2008/01203/FUL

THE VALE OF GLAMORGAN COUNCIL

Town and Country Planning Act 1990
Town and Country Planning (General Development Procedure) Order 1995

REFUSAL OF PLANNING PERMISSION

Agent:
Oaktree Environmental Limited,
Mr. Marco Muia,
Unit 5, Oasis Park,
Road One,
Winsford Industrial Estate,
Winsford,
Cheshire.
CW7 3RY

Applicant:
Sunrise Renewables Limited,
Mr. David Heath,
Gilbert Wakefield House,
67, Bewsey Street,
Warrington.
WA2 7JQ

Erection of new industrial building and installation of 9MW fuelled renewable energy plant at Land at Woodham Road, Barry

In accordance with the application and plans registered on 21 January 2009 the Council in pursuance of its powers under the above mentioned Act and Order hereby **REFUSES TO PERMIT** the proposed development for the following reason(s):

1. The proposed site for the energy plant, by reason of its proximity to nearby residential properties (especially those at an elevated height to the north), is considered to be unacceptable and resulting in an adverse impact on local residential amenity by reason of impacts relating to noise, traffic and pollution from the proposal, as well as a general adverse impact on the character of the area. Accordingly, the proposal is considered to be contrary to Policies WAST2, ENV27, ENV29, EMP2, EMP3 and TRAN11 of the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011.
2. The site is located in close proximity to Barry Waterfront, which is a key development site for the town of Barry and the Vale of Glamorgan as a whole, where the Council is seeking to encourage a high quality maritime development which makes an effective and positive contribution to the social, economic and environmental wellbeing of the community. By reason of the nature of the use, its associated environmental impacts and the poor public perception of such developments, it is considered that the siting of the proposed energy plant in its proposed location would represent a retrograde step for the Council's aspirations for the Waterfront, adversely affecting the amenities of the area and the future attraction of the development. Accordingly the proposal would fail to accord with the objectives of Policies ENV25 and ENV27 of the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011 and the aspirations as detailed in the approved Barry Waterfront Development Principles Supplementary Planning Guidance.

Dated: 31 July 2009



Head of Planning and Transportation

**IT IS IMPORTANT THAT YOU SHOULD READ THE NOTES
ATTACHED TO THIS FORM.**



Appendix 8

Biomass Fuel Supply Assessment

1.0 PROCESS SUMMARY

- 1.1 Waste wood which is suitable for chipping to produce biomass fuel predominantly arises from construction and demolition operations, industrial processes using wood as raw materials, forestry, agriculture and composting operations (oversize materials).
- 1.2 Wood processed by fuel providers arises from every conceivable construction and demolition activity and can include wood with a diverse range of treatments. Difficulty in classifying waste timber is compounded by the lack of segregation by waste producers in the construction and demolition industry and there is currently no common classification system for waste wood received at transfer stations. This document details the range of fuel types that are acceptable and those that are prohibited.
- 1.3 The biomass plant uses a pyrolysis process which breaks up the wood, producing a gas fuel which requires cleaning. The cleaning process involves filtration of solids and cooling the gas to produce condensate. The cleaned gas is in turn used as fuel in gas engines to generate electricity.
- 1.4 Both the fly ash from the filters and condensate remove contaminants that may be present in the wood to leave the gas in a state suitable for combustion in the reciprocating gas engine. Heavy metals are also removed in the same way. The biomass plant is not a mass burn process which results in large volumes of emissions at the stack which require abatement. By the time the gas reaches the engines it has to be clean to ensure that the engines operate efficiently.
- 1.5 The plant is of a size which will require an Environmental Permit before it can operate. As part of the permit application process the Environment Agency will assess the emissions modelling carried out and set emission limits for the process. Modelling has already been carried out by RSK on behalf of the applicant which concluded that the air quality impact of the site operation was not significant. The emissions limits used for the modelling were in line with the Waste Incineration Directive limits which would be set by the Environment Agency.
- 1.6 The main concern from waste wood is the presence of hazardous timber treatments. The British Wood Preserving and Damp Proofing Association (BWPDA) advises its members that only 2 timber treatments are classed as hazardous, namely: Chromated Copper Arsenate (CCA) and Croesote, both of which are now restricted. The presence of small quantities of such wood would not render a load of wood hazardous and the individually treated wood would have to have CCA above specified levels to be rendered hazardous, which is often difficult to assess given the range of treatments using CCA and the fact that up to 40% of the treatment may leach over the life of the treated wood. Whole loads of fuel derived from this type of wood would not be accepted and would damage the engine catalysts.

2.0 FUEL TYPES

2.1 The plant will only gasify fuel derived from waste wood, of the specifications set out below. The designated fuel providers will be required to demonstrate that they can supply feedstock which meets the requirements of this document.

2.2 Grade A

Clean wood, relatively homogeneous (hardwood / softwood), very few 'contaminants' such as fixings, paint, coverings etc.

2.3 Mixed grade

Hard wood and softwood mix, including some minor 'contaminants' such as paint and small nails/screws but as a relatively low proportion.

2.4 Low grade

Processed wood containing contaminants such as panel board, melamine, MDF.

2.5 Prohibited feedstock

2.5.1 To exclude all metals ferrous and non-ferrous, glass, plastics, rubber, cottons, stones and soils or other physical contaminants.

2.5.2 It is acknowledged that with waste wood some minor contaminants, i.e small nails etc may pass through fuel preparation plant. Other materials are not acceptable as they reduce the quality of the gas produced.

2.5.3 Wood treated with hazardous timber preservatives such as Chromated Copper Arsenate (CCA) and Creosote. The contaminants of most concern are copper, chrome and arsenic.

2.5.4 The level of CCA in the general construction and demolition waste stream is very low. The table below shows the relationship between timber treatment chemicals in fresh treated wood and ash from burning weathered CCA timber. The long life of heavily treated timbers results in a lower rate of disposal. Furthermore the majority of wood processors do not accept loads of hazardous timber for recycling. There is also a thriving market in used railway sleepers and telegraph poles which results in a low rate of disposal. The figures below represent a fuel trial carried out on mixed waste wood from construction sites. The samples were taken from a batch of material processed by a biomass plant

Table 1: Comparison of CCA levels in treated wood and recycled wood

Preservative chemical species	Levels of individual chemicals (total) in inputs and outputs					
	CCA raw product	CCA treated wood	CCA treated wood ash (for analysis)	mixed waste wood	bottom ash	fly ash
Arsenic	34%	290 to 2,050 mg/kg	8,980 to 45,000 mg/kg	<3 mg/kg	69 mg/kg	460 mg/kg
Copper	18.5%	1,040 to 1,070 mg/kg	2,720 to 31,500 mg/kg	<6 mg/kg	1,000 mg/kg	550 mg/kg
Chrome	47.5%	1,740 to 2,360 mg/kg	1,780 to 22,500 mg/kg	<4.5 mg/kg	17 mg/kg	97 mg/kg

2.5.5 Table 2: below shows the relationship between the levels of contaminants in waste wood and the quantities removed in the bottom ash and fly ash.

Table 2 - Other significant results

Preservative chemical species	Levels of individual chemicals (total) in inputs and outputs		
	waste wood fuel	bottom ash	fly ash
Boron (from borate preservatives)	<3.5 mg/kg	18 mg/kg	62 mg/kg
Lead (from lead paint)	<10 mg/kg	52 mg/kg	6,900 mg/kg
mineral oil (will include natural hydrocarbons)	<3,100 mg/kg	140 mg/kg	2,200 mg/kg
polycyclic aromatic hydrocarbons	38 mg/kg	780 mg/kg	860 g/kg

2.6 Emissions monitoring.

2.6.1 The plant designers, Hudol Ltd, have a similar plant operating at Capital Valley Industrial Estate, Rhymney. The plant processes different waste types but has been designed to meet strict emission standards i.e. lower than the limits permitted under the Waste Incineration Directive requirements. Appendix A shows the monitoring required for the plant to comply with its permit.

3.0 SOURCE OF FUEL

- 3.1 The feedstock for the Biomass plant will be manufactured off site by designated recyclers using non-hazardous waste wood from household, commercial and industrial sources with the most significant input arising from the construction and demolition industry.
- 3.2 Customers are required by law to accurately describe their waste prior to transferring it to Sunrise Renewables and to complete a transfer note detailing the transaction. The legislation is known as the 'Duty of Care' and is set out in Section 34 of the Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) Regulations 1991.
- 3.3 To accept mixed and low grade feedstock the plant will be WID compliant and be operated under the terms of an Environmental Permit, issued and regulated by the Environment Agency. The plant must meet the BAT (Best Available Technology) requirements of the permitting regime and the Agency has considerable control over the process and the implementation of BAT standards and is the most appropriate authority to control the quality of wood fuel inputs
- 3.4 Fuel suppliers will have a written fuel supply agreement which permits inspection of their production premises by a representative of Sunrise Renewables at any reasonable time during normal working hours, without prior notice. All fuel deliveries must be pre-booked to ensure that the load can be logged and samples taken for verification if necessary.
- 3.5 Fuel suppliers will be given a copy of this document and be advised that non compliance with the permitted fuel types will result in a financial penalty and that they will be liable for any loss or damages incurred as a result of the non compliance. It is the responsibility of the fuel supplier to demonstrate that fuel is not hazardous or contains levels of heavy metals which may affect the performance of the plant.
- 3.6 CCA or creosote treated timber or any timber classified as hazardous within the definition of the Hazardous Waste (England & Wales) Regulations 2005 must not be processed and supplied as a feedstock
- 3.7 The Environmental Permit will require strict monitoring of emissions. The fuel supply agreement will to have terms such that, in the event that the supplier breaches its fuel supply obligations, damages would be payable to compensate the facility for any loss of revenues (i.e. electricity and heat supply and any loss of revenues which may be payable for receiving fuel) in the event of a breakdown or shutdown through failure of emissions monitoring.

- 3.8 Defra have produced a document entitled t “Waste Wood as a Biomass Fuel” April 2008 (Crown copyright), which includes the following statements on waste wood.
- i. Energy Recovery and Recycling are the main alternatives to sending waste wood to landfill;
 - ii. Recycling outlets currently require higher grades of waste wood than energy recovery;
 - iii. Recycling outlets are well developed and there is limited scope for a significant increase in recycling due to dependence on output from other industries and the contaminated nature of most waste wood;
 - iv. Currently energy recovery is the most likely method of diverting additional waste wood from landfill;
 - v. Incentives for producers to segregate waste wood are limited, but these are increasing with future landfill tax increases and requirements to pre-treat waste prior to landfill;
 - vi. Aggregation and waste wood supply chains are in their infancy. There are low barriers to entry so supply chains are likely to develop where demand for waste wood exists;
 - vii. Development of WID compliant biomass facilities for waste wood is complex and the sponsors of such plants are not obvious;
 - viii. Waste wood can help to diversify fuel sources away from over reliance on clean wood to create greater business model flexibility;
 - ix. Commercial arrangements are required with a number of parties (including fuel supply, heat offtake, electricity offtake);
 - x. Compliance with legislation is onerous (e.g. land use planning, WID compliance, Integrated Pollution Prevention and Control permits); and
 - xi. Waste wood fired biomass plants need to be carefully structured to ensure that support can be claimed (e.g. in the form of ROCs and ECAs for Good Quality CHP).

**APPENDIX A -
HUDOL PERMIT
MONITORING
REQUIREMENTS**

Schedule 4 – Emissions and monitoring

Table S4.1 Point source emissions to air except during abnormal operation– emission limits and monitoring requirements

Emission point (shown as A1 on site plan HUPPC.D07 in the application)	Parameter	Source	Limit (including unit) (5)	Referen ce period	Monitori ng frequen cy	Monitorin g standard or method
A1	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Emissions from burners and/or gas engines	90 mg/m ³	Daily mean	Continu ous	ISO 10849
A1	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Emissions from burners and/or gas engines	100 mg/m ³	Half hourly mean	Continu ous	ISO 10849
A1	Carbon monoxide	Emissions from burners and/or gas engines	10mg/m ³	Daily mean	Continu ous (1)	ISO 12039
A1	Carbon monoxide	Emissions from burners and/or gas engines	15mg/m ³	Half hourly mean	Continu ous (1)	ISO 12039
A1	Gaseous and vaporous organic substances, expressed as total organic carbon	Emissions from burners and/or gas engines	7mg/m ³	Daily mean	Continu ous (3)	BS EN 12619
A1	Gaseous and vaporous organic substances, expressed as total organic carbon	Emissions from burners and/or gas engines	10mg/m ³	Half hourly mean	Continu ous (3)	BS EN 12619
A1	Sulphur dioxide	Emissions from burners and/or gas engines	20mg/m ³	Daily mean	Continu ous (2)	BS 6069-4.4
A1	Sulphur dioxide	Emissions from burners and/or gas engines	30mg/m ³	Half hourly mean	Continu ous (2)	BS 6069-4.4
A1	Total dust	Emissions from burners and/or gas engines	7mg/m ³	Daily mean	Continu ous (3)	BS ISO 10155
A1	Total dust	Emissions from burners and/or gas engines	10mg/m ³	Half hourly mean	Continu ous (3)	BS ISO 10155

Table S4.1 Point source emissions to air except during abnormal operation— emission limits and monitoring requirements

Emission point (shown as A1 on site plan HUPPC.D07 in the application)	Parameter	Source	Limit (including unit) (5)	Reference period	Monitoring frequency	Monitoring standard or method
A1	Hydrogen chloride	Emissions from burners and/or gas engines	1mg/m ³	Daily mean	Continuous (4)	MCERTS Performance Standards for CEMs
A1	Hydrogen chloride	Emissions from burners and/or gas engines	16mg/m ³	Half hourly mean	Continuous (4)	MCERTS Performance Standards for CEMs
A1	Hydrogen fluoride	Emissions from burners and/or gas engines	1mg/m ³	Daily mean	Continuous (4)	MCERTS Performance Standards for CEMs
A1	Hydrogen fluoride	Emissions from burners and/or gas engines	4mg/m ³	Half hourly mean	Continuous (4)	MCERTS Performance Standards for CEMs
A1	Cadmium and thallium and their compounds expressed as the elements	Emissions from burners and/or gas engines	0.05mg/m ³	Average over a period of between 30 minutes and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 14385
A1	Mercury and its compounds expressed as the element	Emissions from burners and/or gas engines	0.05mg/m ³	Average over a period of between 30 minutes and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 13211

Table S4.1 Point source emissions to air except during abnormal operation- emission limits and monitoring requirements

Emission point [shown as A1 on site plan HUPPC.D07 in the application]	Parameter	Source	Limit (including unit) (5)	Reference period	Monitoring frequency	Monitoring standard or method
A1	Antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds expressed as their elements	Emissions from burners and/or gas engines	0.5mg/m ³	Average over a period of between 30 minutes and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 14385
A1	Dioxins and furans (I-TEQ)	Emissions from burners and/or gas engines	0.1ng/m ³	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 1948
A1	Specific Polycyclic aromatic hydrocarbons	Emissions from burners and/or gas engines	No limit set	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	ISO 11338,
A1	Dioxins / furans (WHO-TEQ Humans/ Mammals)	Emissions from burners and/or gas engines	No limit set	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 1948
A1	Dioxins / furans (WHO-TEQ Fish)	Emissions from burners and/or gas engines	No limit set	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 1948

Table S4.1 Point source emissions to air except during abnormal operation— emission limits and monitoring requirements

Emission point [shown as A1 on site plan HUPPC.D07 in the application]	Parameter	Source	Limit (including unit) (5)	Reference period	Monitoring frequency	Monitoring standard or method
A1	Dioxins / furans (WHO-TEQ Birds)	Emissions from burners and/or gas engines	No limit set	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 1948
A1	Dioxins like PCBs (WHO-TEQ Humans / Mammals)	Emissions from burners and/or gas engines	No limit set	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 1948
A1	Dioxins like PCBs (WHO-TEQ Fish)	Emissions from burners and/or gas engines	No limit set	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 1948
A1	Dioxins like PCBs (WHO-TEQ Birds)	Emissions from burners and/or gas engines	No limit set	Average over a period of between 6 hours and 8 hours	Quarterly first 12 months of operation and then bi-annually	BS EN 1948

Note 1: The Continuous Emission Monitors used shall be such that the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed 10%. Valid half-hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted this value of the confidence interval (10%). Where it is necessary to calibrate or maintain the monitor and this means that data is not available for a complete half-hour period, the half-hourly average shall nonetheless be considered valid if measurements are available for a minimum of 20 minutes during the half-hour period. (The number of half-hourly averages so validated shall not exceed 5 per day). Daily average values shall be determined as the average of all the valid half-hourly average values within a calendar day. The daily average value will be considered valid if no more than five half-hourly average values in any day have been determined not to be valid. No more than ten daily average values per year shall be determined not to be valid.

Note 2: As Note 1, except that the value of the confidence interval is 20% in place of 10%.

Note 3: As Note 2, except that the value of the confidence interval is 30% in place of 10%.

Note 4: As Note 3, except that the value of the confidence interval is 40% in place of 10%.

Note 5: The limits do not apply during start-up and shut-down

Table S4.1(a) Point source emissions to air during abnormal operation of incineration plant – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
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Table S4.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1 (emission to River Rhymney)	No parameter set	Surface water run off from building roof	No limit set			

Table S4.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method
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Table S4.4 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
A1	Exhaust gas Oxygen concentration	Continuous	MCERTS performance standards for CEMS	
A1	Exhaust gas pressure	Continuous	MCERTS performance standards for CEMS	
A1	Exhaust gas temperature	Continuous	MCERTS performance standards for CEMS	
A1	Exhaust gas water vapour content	Continuous	MCERTS performance standards for CEMS	
Burner combustion chambers (close to inner wall)	Temperature	Continuous	MCERTS performance standards for CEMS	

Table S4.5 Residue quality

Emission point reference or source or description of point of measurement	Parameter	Limit	Monitoring frequency	Monitoring standard or method	Other specifications
Gasification residue	TOC	3%	Monthly	Agency ash sampling protocol	
Gasification residue	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs.	No limit set	Quarterly	Sampling and analysis as per Agency ash sampling protocol	

Gasification residue	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions	No limit set	Before use of a new disposal or recycling route	Sampling and analysis as per Agency ash sampling protocol
Syn gas filtration residue	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs.	No limit set	Quarterly	Sampling and analysis as per Agency ash sampling protocol
Syn gas filtration residue	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions	No limit set	Before use of a new disposal or recycling route	Sampling and analysis as per Agency ash sampling protocol
Aqueous residue from syn gas water scrubbing	Substances listed in annex IV of the Waste Incineration Directive	No limit set	Before use of a new disposal or recycling route	Methods from section 4.5.4 of Guidance on Directive 2000/76/EC on the incineration of waste edition 3



Appendix 9

CHPQA Assessment

PLANNING APPLICATION. NO. 2008/01203/FUL**ERECTION OF NEW INDUSTRIAL BUILDING AND INSTALLATION OF 9MW WOOD FUELLED RENEWABLE ENERGY PLANT ON LAND AT WOODHAM ROAD, BARRY DOCKS ON BEHALF OF SUNRISE RENEWABLES LTD****1.0 INTRODUCTION TO CHPQA**

- 1.1 The purpose of this document is to assess Sunrise Renewables Ltd's proposed biomass plant against the guidance entitled The CHPQA Standard (Issue 2) produced by defra in November 2007. It also considers WAG guidance on renewable energy in Section 4.0.
- 1.2 The guidance states that "CHPQA is an initiative by the Government to encourage the wider practical application of Good Quality Combined Heat and Power, Community Heating and Alternative Fuel technologies".
- 1.3 Section 2 refers to the low efficiency of traditional power stations i.e. in the range 25-50%, based on the Gross Calorific Value (GCV) of the fuel and including transmission and distribution losses. Therefore 50-75% of the energy content of the fuel is rejected as heat directly to the atmosphere or into seas or rivers. The generation of electricity and the recovery of heat in CHP Schemes typically achieve overall efficiencies of 60-80% and sometimes more. Sunrise Renewables aims to achieve an efficiency in the region of 60%+. The basic design on the plant can achieve an efficiency of almost 50%.
- 1.4 The aims of CHPQA are clear:
- i. Define, assess and monitor the quality of CHP Schemes on the basis of energy efficiency and environmental performance.
 - ii. Ensure fiscal and other benefits are in line with environmental performance.
 - iii. Provide clear signals to users and potential users to minimise the cost of energy demands through CHP.
 - iv. Achieve the above at minimum cost to CHP users and to Government.
- 1.5 The CHPQA programme applies immediately for new schemes from January 2007.
- 1.6 The calculation of primary energy savings will comply with Article 12(2) of the European Union Directive 2004/008/EC – Promotion of Cogeneration based on a useful heat demand in the Internal Energy Market. Therefore, GQCHP with total installed capacity of $\geq 1\text{MWe}$ must provide $\geq 10\%$ primary energy savings compared with the Directive's harmonized reference values for separate production of heat and electricity. This aspect will subject to independent review and certification.

2.0 DETAILED REQUIREMENTS

- 2.1 Sunrise Renewables will be the Responsible Persons operating the CHP Scheme and must demonstrate compliance with the CHPQA Standard to gain and maintain Good Quality CHP Certification.
- 2.2 To comply with the CHPQA Standard Sunrise Renewables Ltd's scheme will
- i. Apply for Registration
 - ii. Install appropriate monitoring systems and maintain appropriate records
 - iii. Conduct a Self-Assessment and apply for Certification under CHPQA
 - iv. Comply with Validation and Audit obligations
 - v. Notify the Administrator of any changes to the Scheme relevant to the Registration and Self-Assessment.
- 2.3 Sunrise Renewables Ltd is aware of the role of the Administrator of the CHPQA programme set out in Section 5 of the guidance and will comply with the guidance produced to enable a certificate of Good Quality CHP to be issued to the scheme and will comply with periodic Audits by the Administrator. It will ensure that there are appropriate systems in use to monitor all energy inputs and outputs for the Scheme which are relevant to the calculation of Quality Index, Power Efficiency and other parameters. Monitoring systems will apply to both main and auxiliary fuel inputs. All monitoring systems shall be designed, installed and verified to provide the appropriate standards of accuracy as defined in the CHPQA Guidance Notes. Sunrise will maintain records of annual energy inputs and outputs and retain them for a minimum of six years.

3.0 SELF ASSESSMENT

- 3.1 Self-Assessment requires that the Responsible Person shall specify, determine or calculate the following (refer to Appendix A for definitions):
- (i) Scheme boundary and selected QI definition
 - (ii) Monitoring and recording provisions
 - (iii) Power Efficiency
 - (iv) Heat Efficiency
 - (v) Quality Index (QI)
 - (vi) Qualifying Power Capacity (CHP_{QPC})
 - (vii) Qualifying Heat Capacity (CHP_{QHC})
 - (viii) Qualifying Fuel Input (CHP_{QFI})
 - (ix) Qualifying Power Output (CHP_{QPO})
 - (x) Qualifying Heat Output (CHP_{QHO})
- 3.2 The calculation of the above parameters will also provide evidence to the Vale of Glamorgan and the Environment Agency in support of the site's CHP status.
- 3.3 Self assessment will be reported to the Administrator using proformas to define the CHP Scheme, to record fuel inputs and energy outputs and to calculate the required parameters. The Administrator will validate the Self-Assessment. Validation activities shall be appropriate to the size of the Scheme. The Administrator shall determine whether the Scheme meets the Good Quality CHP Threshold Criteria, for all or part of its inputs, outputs and capacity, and issue Certification to this effect.

4.0 BIOENERGY ACTION PLAN FOR WALES CONSULTATION (CLOSES 22 MAY 2009)

- 4.1 Sunrise Renewables supports the Assembly Government's consultation document and considers that its proposed scheme assists in maximising carbon savings.
- 4.2 The consultation refers to a number of ways to achieve carbon reductions, which includes contaminated waste wood used in CHP or power stations which comply with waste incineration regulations.
- 4.3 The document states that schemes involving waste biomass "would be among the most cost effective means of saving carbon emissions due to the low cost of the fuel or even access to gate-fees for avoidance of landfill costs". This aspect has been detailed in the application.
- 4.4 Some of the Assembly Government's buildings will use biomass heating and there is no practical reason why the Vale of Glamorgan's Dock Offices cannot benefit from the use of heat in the Winter and chilling in the Summer.
- 4.5 The consultation states that "biomass is an internationally-traded commodity and bioenergy applications in Wales will source the raw material from various locations, inside and outside Wales. However, an attempt is made at assessing the extent to which Wales's future bioenergy needs can be met from Welsh resources, and a distinction is made between British and imported biomass". Sunrise will not use imported, non-British biomass.
- 4.6 The UK Biomass Strategy has assessed biomass use for energy generation in relation to the cost-effectiveness of carbon savings. The hierarchy is one of the key considerations in the development of a bioenergy action plan for Wales. The most cost-effective options are expected to include:
- i. Energy from waste that would otherwise go to landfill
 - ii Heat or CHP generation x Electricity generation.
- 4.7 The document states that the WAG "is particularly keen to see schemes developed that maximise carbon savings; for example..... contaminated waste wood used in CHP or power stations which comply with waste incineration regulations". The WAG also wished to encourage Community district heating and is seeking ways to encourage more communities to adopt district heating schemes using biomass.
- 4.8 The application site is also very close to the Barry Waterfront development which is identified as one of WAG's Zero Carbon Development Masterplan sites 2007-11. Sunrise Renewables has obtained a letter of support from developers working on the project.

- 4.9 The consultation also states that “contamination precludes the wood from being recycled so most of it is currently disposed of in landfill. Recovery of the energy from the wood is far preferable provided it can be done in compliance with waste incineration regulations”. The Environment Agency will be dealing with the permit application for the plant to ensure such compliance.

APPENDIX A - DEFINITIONS:

1. Administrator is that body contracted by the Government to have responsibility for the management of the CHPQA programme.
2. Alternative Fuels are fuels other than Conventional Fuels and they fall into broad categories for the purposes of CHPQA (see Table 1).
3. Audit is any activity carried out by the Administrator to confirm compliance with this Standard. It typically includes a site-based evaluation of the operation of a CHP Scheme to confirm that the Self-Assessment is founded on a correct interpretation of the CHPQA Standard and that the data and calculations submitted are corroborated by site data records.
5. Certification is the issuing by the Administrator of a certificate that a Scheme meets the criteria for Good Quality for all or part of its energy inputs, outputs and capacity, based on Validation of Self-Assessment submitted by a Responsible Person.
6. CHP (Combined Heat and Power) is defined as the simultaneous generation of heat and power in a single process. The power output is usually electricity, but may include mechanical power. Heat outputs can include steam, hot water or hot air for process heating, space heating or absorption chilling.
7. CHPQA programme is a management and administrative process under which Registration and Certification is being taken forward. It proceeds through the application for Registration and Self-Assessment of CHP Schemes by a Responsible Person to Certification in accordance with the criteria for Good Quality CHP. The Administrator will carry out Registration, Validation, Certification and Audit on behalf of the Secretary of State for the Environment.
8. CHP Scheme means the equipment and operating system for the whole Scheme, including monitoring systems, at any stage of development from design to actual operation. It will include one or more prime movers (e.g. gas turbine or reciprocating engine) driving electrical generator(s) or mechanical loads and some means of recovering waste heat, which would otherwise be released to the environment, for a useful purpose.
9. CHP Qualifying Heat Output (CHPQHO) is the registered amount of useful heat supplied annually from a CHP Scheme (MWhth). It is heat output that is demonstrably utilised to displace heat that would otherwise be supplied from other sources.

Note: CHPQHO excludes any heat rejected to the environment without any beneficial use. Examples include, inter alia, heat lost from chimneys or exhausts and heat rejected in equipment such as condensers and radiators.

12. CHP Qualifying Power Capacity (CHPQPC) is the registered power generation capacity of a CHP Scheme (MWe) that qualifies as Good Quality CHP. It is used for monitoring the installed capacity of Good Quality CHP in the UK. Most Schemes will meet the relevant Threshold QI Criterion for Good Quality CHP Capacity and therefore CHPQPC is the same value as the total power capacity (CHPTPC). For a Scheme that does not achieve the Threshold QI Criterion for Good Quality CHP,

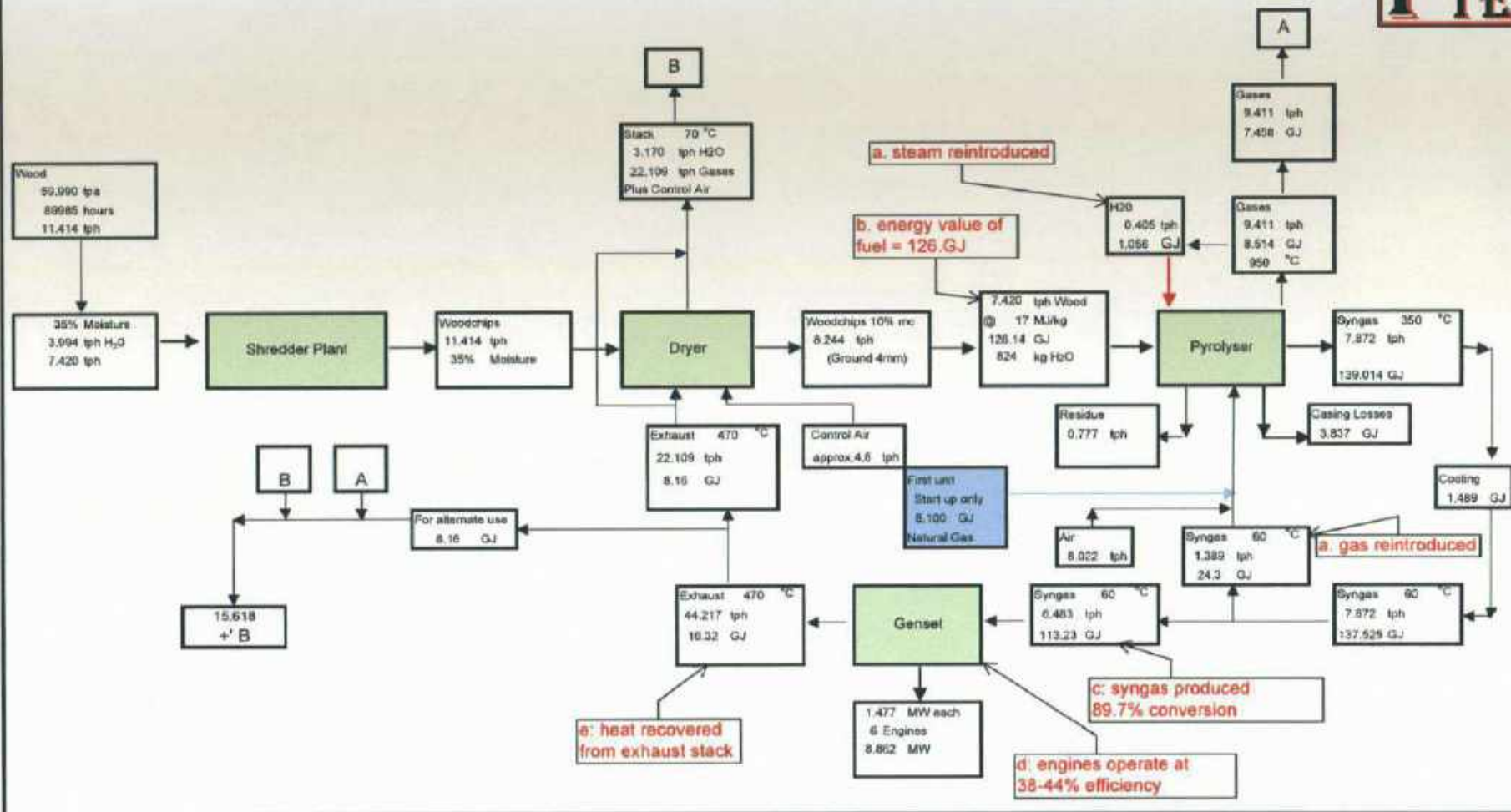
CHPQPC is that portion of the total generation capacity that would achieve the Threshold QI Criterion, under the conditions of Maximum Heat Output under Normal Operating Conditions.

13. **CHP Qualifying Power Output (CHPQPO)** is the registered annual power generation from a CHP Scheme (MWh) that qualifies as Good Quality CHP. Most Schemes will meet the relevant Threshold QI Criterion for Good Quality CHP in Annual Operation and therefore CHPQPO is the total power output (CHPTPO). For a Scheme that does not achieve the Threshold QI Criterion for Good Quality CHP, CHPQPO is that portion of the annual power output from a Scheme that would have achieved the Threshold QI Criterion, based on the actual annual heat supplied (CHPQHO).
14. **CHP Total Fuel Input (CHPTFI)** is the total registered annual fuel input to a CHP Scheme (MWh), based on GCV.

Mass & Energy Flow Diagram

(NOMINAL 9MW)

SRB/007 - Process Energy / Mass Balance Diagram





Appendix 10

Design and Access Statement

DESIGN AND ACCESS STATEMENT

Applicant: Sunrise Renewables Limited

Site: Barry Docks, Woodham Road, Barry

Application: Erection of New Industrial Building and Installation of 9MW Wood Fuelled Renewable Energy Plant

- 1.1 The applicant favours using allocated industrial land for creation of new energy facilities in line with government guidance. Such sites are becoming more scarce as in many areas new industrial development competes with the housing market on brownfield sites.
- 1.2 The building will be of steel portal frame construction and covered with micro profile cladding to all elevations with the option of wood cladding on the front elevation.
- 1.3 The building location has been chosen because it is within an industrial site and set against a backdrop of existing industrial buildings. The only access to the plant by vehicle is for parking and deliveries/collections. Delivery/collection vehicles will enter the site from the existing road on Woodham Road and will not affect any other business users. The building has been chosen to ensure that it does not impose upon the adjacent uses and is set back against an existing series of large buildings which ensures that the proposal will not be obtrusive. The parking and access areas are flat and travel distances from parking spaces are short. Disabled parking is available adjacent to the building. The height of the building is the minimum required to accommodate the Biomass plant. All access areas have doors, which will accommodate wheelchair access and ensure that pedestrian access is not necessary through the roller shuttered doors.
- 1.4 The site will be manned 24 hours per day so additional security is not necessary. The building will be closed to external access i.e. all visitors will have to make their presence known by ringing a doorbell.
- 1.5 A supplementary planting scheme will be prepared as agreed with the local planning authority.
- 1.6 The location of the external plant such as the flue, cooling tower etc. has been assessed and the area chosen has been found to be the best location for screening. The height of the flue at 20 metres will be partially screened by the proposed building and positioned as unobtrusively as possible.
- 1.7 The layout has been designed to accommodate the maximum amount of plant and equipment within the building. Very little space will remain unused in the proposal enabling the plant to have a negligible impact upon its surroundings.
- 1.8 The application process for the PPC Permit will involve widespread consultation.

- 1.9 The main access point has been chosen because it is established and there are also no other feasible access points.
- 1.10 Site visitors performing statutory functions usually travel by car as officers have to bring their own PPE (personal protective equipment) such as safety boots, hi-vis vest etc.
- 1.11 The site access route and internal surfaces provide sufficient access for emergency services, who will be provided with an updated emergency and access plan and contact numbers before the plant is operational. The building has sufficient access and egress points in the event that evacuation is required in an emergency.
- 1.12 The site is designed to facilitate inclusive access and it is envisaged that young persons undertaking educational visits and disabled visitors will be guided around the site in a company vehicle to comply with the requirements of the Health and Safety at Work Act. Where disabled visitors and other visitors are able to access the warehouse on foot to observe operations they will be individually risk assessed and provided with appropriate PPE and an induction on relevant safety matters. A representative of "The plant operator" will accompany all visitors to the site.
- 1.13 All visitors are welcome to observe the new plant, which is amongst the first of its size in the UK. The planning application is available for all environmental and community groups to comment on. Electronic copies of the application statement are available on CD upon request from Oaktree Environmental's office stated in Section 1.4 of the planning statement.
- 1.14 The site is able to adapt to changing needs and is equally capable of pyrolysing biomass fuels, natural wood and other renewable feedstocks. The time of day/year will have little impact upon the development, which will continuously supply energy to the national grid. There may be seasonal fluctuations in the availability of timber in the transfer station's wood inputs but there will be sufficient capacity inside the building to store excess feedstock.
- 1.15 In summary the pyrolyser provides a facility, which enables energy to be generated from waste wood, which would otherwise be taken to landfill or burnt in the open on garden bonfires or demolition sites. The plant provides a facility to process fuel with minimal emissions and produce sustainable electricity making the site a net producer of renewable energy.
- 1.16 Where possible all signs will have a combination of written instructions and/or symbols and pictures to enable ease of understanding by all users. Site users other than employees and contractors will not be permitted to move around the site without an escort for safety reasons.
- 1.17 The design of the Biomass plant is being undertaken by a South African company, Prestige Thermal Equipment (PTE). PTE are the leaders in the chosen technology and have several established pyrolysers, including one at Tythegston Landfill and Capital Valley in South Wales.



Appendix 11

Planning Statement

PLANNING STATEMENT

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APPENDICES: (submitted electronically on the Planning Portal):		
	Reference	Title
APPENDIX I DRAWINGS	SRB/001	Site Location Map
	SRB/002	Site Location Plan
	SRB/003	Site Layout Plan
	SRB/004	Building Elevations
	SRB/005	Internal Layout
	SRB/006	Site Photographs
	SRB/007	Process Energy Flow/ Mass Balance Diagram
APPENDIX II SUPPORTING DOCUMENTATION	SRB-A	Design and Access Statement
	SRB-B	Policy Review
	SRB-C	Waste Audit and Facilities Strategy
	SRB-D	EA Position statement on wood
	SRB-E	Prestige Thermal Equipment (PTE) Brochure
	SRB-F	Groundsure Report Extract - Maps
	SRB-G	Groundsure Geology and Ground Stability Report
	SRB-H	Groundsure Environmental Data Report
	SRB-I	WRAP Wood Recycling Guide
	SRB-J	Flood Risk Assessment (RSK)

Document history:

Document Versions	Issue date	Status	Revisions	By	Checked by
1.0	24 June 2008	Draft	proof reading stage	MM	n/a
1.1	15 August 2008	Final	approved document	IH	MM
1.3	3 September 2008	Submitted	completed	AA	MM

1.0 INTRODUCTION

- 1.1 This document provides a detailed account of the planning application by Sunrise Renewables Limited ("the applicant") to install a Biomass Plant ("the plant") of up to 9MW capacity on land off Woodham Road at the Port of Barry. The plant will be fuelled by reclaimed wood arising from local recycling operations.
- 1.2 The application site is located on existing industrial land at the Port of Barry which is an established business and industrial area in the Vale of Glamorgan. The site location is shown on Drawing Nos. SRB/001 and SRB/002. The site will be occupied by the applicant under the terms of a lease with the landowner Associated British Ports.
- 1.3 Contact details for Sunrise Renewables Limited are as follows:
- Contact: David Heath Title: Director
Address: Sunrise Renewables Limited, Warrington Business Centre, Gilbert Wakefield House, 67 Bewsey Street, Warrington WA2 7JQ
- 1.4 Oaktree Environmental Limited act as planning and environmental consultants for Sunrise Renewables Limited. Contact details are as follows:
- Contact: Marco Muia Tel: 01606 558833
Title: Director Fax: 01606 861182
Address: Oaktree Environmental Ltd
Unit 5, Oasis Park, Road One
Winsford Industrial Estate
Winsford, Cheshire CW7 3RY
- 1.5 The Biomass plant will be built and installed by Prestige Thermal Equipment. Contact details are included in the brochure submitted with the application as document reference SRB-E.
- 1.6 The site will provide a local source of renewable energy and will be available by appointment to members of the public and educational bodies to view the facility to enhance public knowledge of recycling and Biomass energy production.
- 1.7 During the preparation of this statement the advice given by national, regional and local planning policies and guidance documents has been taken into consideration. Detailed consideration of policies is addressed in the Policy Review document reference SRB-B.
- 1.8 The area which is the subject of this planning application is outlined in red on Drawing No. SRB/002. All references to 'the site' in this statement shall mean this area. No adjoining land is occupied by the applicant.

1.9 The benefits of the proposal are:

- i. Reduction in disposal of wood to landfill.
- ii. Additional outlet for recycled wood as a buffer against the fluctuating board mill and animal bedding market sectors for recycled wood chip.
- iii. Contributes to national and regional targets for renewable energy provision as well as providing additional energy capacity.
- iv. Contributes to reduction in carbon dioxide emissions.
- v. Supply of energy to the grid equivalent to the annual usage of approximately 22,000 households (average household consumption in the UK is 3,300kWh).
- vi. Reduction in vehicle movements to local landfill sites.
- vii. Will utilise the latest technology available for biomass energy schemes providing a source of both heat (can be used up to 1km from the site) and electricity locally (via the National Grid).

1.10 All application documents have been submitted electronically via the Planning Portal. Paper copies are available from Oaktree Environmental at the address shown in paragraph 1.4 above.

2.0 APPLICATION PROPOSALS

2.1 The title of the application is

*"Erection of New Industrial Building and Installation of
9MW Wood Fuelled Renewable Energy Plant"*

The plant will be capable of pyrolysing up to 72,000 tonnes of wood per annum. This equates to approximately 216 tonnes per day, which will be sourced from wood recycling operations locally under a fuel agreement.

2.2 The plant will be operated during the following hours for the receipt of fuel and all other external operations, otherwise the plant will operate as a 24 hour process within the building:

Monday to Friday	07:00 - 19:00
Saturday	07:00 - 19:00
Sunday /Bank/Public holidays	08:00 - 16:00

2.3 The Biomass plant will operate and provide electricity to the grid 24 hours per day, with allowances for maintenance and breakdowns. The entrance gates will be closed upon the cessation of daily operations to ensure that there is no unauthorised access.

2.4 Adequate lighting will be provided within the building in addition to rooflights. Directional floodlights will be used externally after official lighting up times and their location will be agreed with the local planning authority prior to installation. Proposed locations are shown on Drawing No. SRB/004.

2.5 The site will be set out in accordance with and use the access/egress points shown on the site layout plan (Drawing No.SRB/003). Vehicle movements are addressed in Section 9.0 below. The site is already secured by a fence a round part of the perimeter, much of which is in disrepair. The site will be enclosed by new galvanised steel palisade security fencing and gates to a maximum height of 2.4 metres.

2.6 Operational space within the site is shown on Drawing No. SRB/003. There will be sufficient space within the building for the overnight storage of plant and equipment associated with operations.

2.7 The installation of the new Biomass plant is amongst the first of its kind in the UK and will result in the generation of a minimum of 8 local jobs based at the site and further jobs at the designated fuel supplier.

2.8 External plant and equipment on the site will be minimal and will consist of an exhaust stack for the gas engine exhaust, which will be a maximum of 6 metres above the ridge line of the building i.e. 20 metres. Additional modelling has indicated that the stack will be closer to 16 metres in height and further confirmation will be available following receipt of test data from the manufacturer in October 2008. The stack is shown on Drawing No. SRB/004.

3.0 ENVIRONMENTAL INFORMATION

- 3.1 Drawing No. SRB/001 shows the environment around the site and in particular the immediate neighbours. Desk top study information is presented in Document SRB-F which includes plans from the Groundsure Report showing other land uses and sensitive sites within 500 metres of the application site.
- 3.2 The site is partially vacant and occupied by a container storage and refurbishment operation.
- 3.3 The site is within an area affected by flooding and is within the indicative Zone 3 floodplain. RSK have prepared a flood risk assessment for the application (document reference: SRB-D) in liaison with the Environment Agency.
- 3.4 The site is not located over a groundwater Source Protection Zone (SPZ). In any event the site will not impact upon groundwater as any potentially polluting outputs will be discharged to foul sewer in accordance with the requirements of a trade effluent consent or removed from the site by vehicle.
- 3.5 An ecological survey is not required as the site is previously developed and consists only of a compacted hard standing surface which is not vegetated. There are no sites with sensitive flora or fauna having a statutory or local nature conservation designation within 500 metres of the site in the Groundsure Report. The nearest designated site is the SSSI named "Hayes Point to Bendrick Rock" at a distance of 616 metres from the site (SSSI 510 administered by the Countryside Council for Wales) and covering an area of 29 hectares.
- 3.6 The site has no clearly defined planning history but historical maps indicate that the following uses have occurred on the site:
- 1879: Undeveloped estuarine land and river bed of Cadoxton River
 - 1898 to 1900: Land reclaimed to rail head, coal tip/loading dock
 - 1920 to 1973: Railway engineering works/rail head
 - 1989: Builder's yard

4.0 PLANT, EQUIPMENT AND INFRASTRUCTURE

- 4.1 The biomass feedstock will be provided by existing recycling and waste wood processing operations within a 15 mile radius of the site under the terms of a fuel agreement. The UK currently faces an over supply of waste wood for the types of reuse shown in the WRAP Wood Recycling Guide (Document SRB-1), resulting in large volumes of wood remaining in the landfill bound waste stream or provided to uses which are unsustainable.
- 4.2 The wood feedstock will be produced to specification at the site by appropriate chipping, shredding and screening plant equipped with magnetic separators to remove nails etc
- 4.3 The Biomass Plant requires an Environmental Permit (formerly a Pollution Prevention and Control [PPC]) permit from the Environment Agency, which will be submitted following determination of the planning application. For the purposes of this document all references to 'the site' shall mean the area of site allocated to the Biomass plant and the associated infrastructure, plant and equipment. The site is shown on Drawing No. SRB/002.
- 4.4 The plant layout is shown on Drawing Nos. SRB/003 and SRB/005. The specific plant to be installed is as follows:

<u>Type of plant/equipment</u>	<u>No.</u>	<u>Function</u>
Wood chipper	1	Size reduction of feedstock
Dryer	1	Reduction of feedstock moisture content
Grinder	1	Reduction of feedstock to <5mm size
3 MW pyrolyser	3	Heating wood waste to produce the raw syngas
Gas engine (1.5 MW)	6	Burning the refined gas to produce energy
Thermal oxidiser	1	Emissions abatement
Exhaust stack	1	Emits cleaned exhaust emissions from all engines

- 4.5 In addition to the above installation the plant will use mobile plant i.e. a loading shovel or grab as required.
- 4.6 A water bowser will also be available for use on site, mainly to keep dust to minimum on all vehicle running surfaces. A vacuum tanker/road sweeper or brush and shovel will be used to clean the site access road and the highway, although it is not expected to be required beyond the site construction phase.
- 4.7 The proposed building will be of steel portal frame construction, to be surfaced with micro profile or box profile cladding to all external elevations. The colour and specification of the panels will be agreed with the planning authority prior to construction. The roof will have rooflights to reduce the requirement for internal lighting.

- 4.8 The floor slab of the building will be surfaced with mesh or fibre reinforced concrete floor slab, the specification of which requires agreement with the Environment Agency and will be of sufficient strength for the tipping and storage of fuel and operating loading plant. The internal layout of the building is shown on Drawing No. SRB/005.
- 4.9 The building will be split into specific areas, the main subdivisions of which are summarised below and shown in further detail on Drawing No. SRB/005:
- i. Storage and loading area;
 - ii. Fuel preparation area (chipper, dryer and grinder);
 - iii. Pyrolyzers;
 - iv. Gas engines located within an acoustic enclosure;
 - v. Thermal oxidiser and exhaust stack;
 - vi. Switchroom;

The layout on Drawing No. SRB/005 is indicative only and the final layout will be subject to the design engineers specifications and calculations.

- 4.10 Vehicle access and egress to and from the site will not change and is shown on Drawing No. SRB/003.
- 4.11 All internal surfaces will drain to a sealed sump or foul sewer. External surfaces will drain to a sustainable surface water system and roof water will drain to a soakaway or be reused in the process.
- 4.12 Parking provision will be as agreed with the local planning authority. Initial provision is for 5 spaces plus 1 disabled space.
- 4.13 Details of the building design are discussed the Design and Access Statement submitted as document reference SRB-A.

5.0 SITE MANAGEMENT

- 5.1 The site will be inspected every day by a person who is familiar with the requirements of the planning and permit requirements for the site. All details of defects, problems and repairs carried out will be recorded in the site diary or on suitable forms agreed with the Environment Agency.
- 5.2 Detailed procedures for the maintenance of the Biomass plant, including breakdowns, spillages, accidents etc. are all regulated by the Environment Agency as part of the EP application process. The site will open for the receipt of fuel or for other essential operations during the hours listed in Section 2.0 above. Depending upon shift patterns there will be a requirement for approximately 8-9 industrial and office staff to support the new operation. Additional staff will be required for holiday cover. The list below details the staff structure required when the plant is fully operational:

<u>Position</u>	<u>No.</u>	<u>Responsibilities</u>
Site manager	1	Overall site management
Administrator	1	Off site at head office
Machine/plant operator	1	Operating loading plant/site supervision
Maintenance /plant operators	2	Plant supervision

- 5.3 The staff will be trained to supervise the Biomass plant. All operations on site will be carried out in accordance with the relevant requirements of the Health and Safety at Work Act 1974 and the company health and safety policy. Conditions of site use for employees, visitors and contractors will be available to all visitors who will be required to sign in and out of the site when making visits for any purposes. Minors and disabled visitors may be escorted around the building in a company vehicle to ensure compliance with the site rules. Anyone not complying with the conditions of use will be asked to leave the site.
- 5.4 Fire extinguishers will be kept on site to deal with fires and site staff will be trained in emergency procedures and the emergency services will be given a copy of site plans and contact names and numbers for emergency purposes. This will form part of the accident management plan required by the Environment Agency.
- 5.5 A first aid kit will also be kept on site and will be maintained to the standard required by the Health And Safety (First-Aid) Regulations 1981 and at least one person per shift will be a trained first aider.

6.0 RECEPTION AND HANDLING PROCEDURES

- 6.1 All vehicle deliveries will be pre-booked and drivers will report to the person responsible for site supervision upon arrival at the site. The load will be visually inspected before and during discharge to ensure that it meets the specification set out in the fuel supply contract.
- 6.2 Unsuitable loads will be rejected and loaded back on to the vehicle for delivery to another more suitable site and where necessary the Environment Agency will be notified. A skip will be available on site for waste generated as part of the process i.e. packaging, sweepings etc. All residues arising from the process will be dealt with as detailed in Section 9.0 below.
- 6.3 The fuel will be discharged directly into the building via the doors at the front of the building, which will be electrically operated roller shutters.
- 6.4 The site will be staffed at all times when it is open, to effectively supervise the reception and handling of fuel and removal of waste.
- 6.5 The wood fuel will be sourced from existing operations nearby to ensure that the correct sized fuel is produced. Other sources of wood fuel will be researched and contracts made where necessary to secure suitable material from other wood recyclers to protect against shortages in supply or breakdowns in the processing plant on site. The wood fuel accepted will be manufactured from clean wood, pallets, construction timber and other woods which have been removed from the construction and demolition waste stream locally. In short, the plant will process dry, non-hazardous batches of timber and wood.

7.0 ENVIRONMENTAL CONTROL - GENERAL

- 7.1 Site operations will be carried out to minimise the creation of dust. A permanent constant mains water supply will be available on site in all climatic conditions to ensure that the dust suppression systems can function effectively and all external water pipes are lagged to prevent frost damage during Winter months. Dust in the hopper and conveyor area will be controlled using a hand held water hose or vacuum extraction system.
- 7.2 The site staff will continuously monitor dust emissions whilst the plant is in operation and take appropriate action when required. In addition the site supervisor will visually monitor for dust emissions at the site perimeter at least twice daily to ensure that no dust blows off the site. Results of monitoring exercises will be entered into the site diary.
- 7.3 Water sprays and/or bowsers will be used to reduce dust levels on all external site surfaces where necessary. This particularly applies to site roads, storage, loading and unloading areas. Vehicles carrying potentially dusty loads off site will be securely sheeted or sprayed with water to reduce dust emissions.
- 7.4 Stockpiles will be located within the proposed building to ensure that vehicles leaving the site cannot track through the stored material to prevent deposit of debris on the highway. The deposit of material on the highway will be treated as an emergency and will be cleaned with a road sweeper if necessary.
- 7.5 Mud/litter on roads - The deposit of material onto the access road and highway is unlikely, however if it does occur during the construction phase, for example, it will be cleared using a road sweeper or hand picked in the case of litter.
- 7.6 Visual inspections of the site surface will be carried out daily and staff will report any problems with debris on the site surface immediately to the site supervisor. Vehicles will be visually inspected before exit to check that loads are safe and that no debris is carried out on the wheels or body of the vehicle.
- 7.7 Odour - No material will be accepted which is likely to cause an odour nuisance. Any loads which are malodorous will be rejected and the Environment Agency informed. The Biomass plant itself does not produce odorous emissions.
- 7.8 Vermin/insect/bird control - The proposed fuel types will ensure that the site will not suffer from a vermin infestation. However, given the proximity of water bodies the site will be inspected daily for the presence of vermin and the results of the inspection noted in the site diary or site inspection form. In the event that vermin are discovered on site a recognised pest control contractor will be hired.

8.0 THE BIOMASS PROCESS

- 8.1 The detail of the process is complex and outside the remit of this document. For land planning purposes we need to predict the potential impacts of the proposal in terms of emissions and outputs.
- 8.2 Drawings SRB/007 provides a simplified breakdown of the gas production process in the form of an energy flow diagram.
- 8.3 Photographs in the PTE brochure in (ref SRB-E) show the appearance of similar plant. The plant has been designed by a Welsh company, Hudol Ltd, with planning consent passed for 3 sites incorporating the technology i.e. Tythegston Landfill and Capital Valley in South Wales and Hooton on the Wirral. The two Welsh sites have been built and have permit applications before the EA, with the issue of both permits expected shortly. The sites are larger than this proposal. The technology has met the BAT (Best Available Technology) requirements of the permitting regime.
- 8.4 The wood to be processed must meet a uniform specification for effective gas production i.e. a moisture content of 10% after drying, free of contamination from litter, metals etc.
- 8.5 The process is in summary as follows:
- i. Wood fuel at up to 35% moisture content is deposited into a hopper by a wheeled loading shovel which feeds a chipper which reduces the size of the wood prior to entry into the dryer.
 - ii. The dryer reduces the moisture content of the wood to 10% in preparation for the grinding process.
 - iii. The grinder reduces the wood chips further to a sub 5mm feedstock. Excess heat from the engine exhausts is used in the drying process.
 - iv. The fine feedstock is delivered to a silo which enables a constant feed to the pyrolysers.
 - v. The pyrolysers operate on a ... principal... which evolves the raw syngas from the wood fuel, which provides a constant fuel for the gas engines with the residual gas stored in the syngas buffer tank to regulate the gas flow to the engines.
 - vi. The engines burn the gas to produce electricity.
 - vii. The engines transfer electricity to the grid via an alternator, transformer and substation.

- 8.6 The applicant is also investigating the feasibility of reusing the waste thermal energy to heat adjoining offices and buildings. The conversion of energy in biomass to producer gas is 80%.
- 8.7 The gas engines are compressed natural gas and combined heat and power engines. Each engine is in an acoustic enclosure to reduce noise to a minimum. The whole process is controlled from a computerised control room where all temperature and pressure sensors provide a visual display for the operator to regulate the process.
- 8.8 Output calculations/projections are based on the maximum annual throughput of 72,000 tonnes of fuel and 52 weeks' operation as a 24 hour process (8,000 operational hours out of 8,760 hours per year).
- i. Input tonnages used to calculate the outputs are:

Hourly - 9 tonnes; Daily - 216 tonnes; Weekly - 1,512 tonnes
 - ii. The pre-processing of wood waste to produce fuel off site removes the need to store large volumes of contamination such as ferrous, non-ferrous metals, plastics and fines etc.
 - iii. The figures given below for char and ash is combined because the plant has a combined collection bin. Both can be used for manufacturing such as building block manufacture. The char may be reintroduced back into the process or sold as filter media.
 - iv. The particulates from any filter/abatement equipment produce a low volume of residues which will be bagged or discharged to sealed containers for landfill disposal unless a recovery option can be used.
 - v. The stack (exhaust) will have no visible air emissions as particulates will be controlled using the abatement equipment agreed with the Environment Agency. The process does not use hot water to produce steam and all water involved in the cooling process will go to sewer.
- 8.9 In summary the main emissions / outputs are:
- i. Ash/ char
 - ii. Condensate
 - iii. Filtration solids similar to ash.
 - iv. Steam/heat
 - v. Exhaust gases

8.10 The table below gives approximate figures for process outputs based on the throughput and operational hours stated in the previous paragraphs:

Table 8.1 - Process input requirements and outputs

Type	Quantity required or produced			Notes
	Hourly	Daily	Weekly	
Wood fuel	9 tonnes	216 tonnes	1512 tonnes	totals assume constant operation
Water feed input requirement	4.5 m ³	108 m ³	756 m ³	26 m ³ initial fill required, additional moisture from wood
Total recirculating cooling water	67 m ³	-	-	@ 30 to 40°C
Drainage/condensate	0.75 m ³	18 m ³	126 m ³	
Char / Ash	270 kg	6.48 tonnes	45.36 tonnes	3%
Filter residues/ abatement residues (particulates)	< 1 tonne	< 1 tonne	< 1 tonne	n/a

9.0 TRAFFIC MANAGEMENT, ACCESS AND NOISE CONTROL

- 9.1 Access to the site will be gained from the surrounding road network as shown on Drawing No. SRB/001. Car parking space will be adequately provided for as shown on Drawing No. SRB/03. There will also be adequate space within the building for the overnight storage of plant and equipment.
- 9.2 Wood fuel will be delivered to the site during the hours of 07:00 to 19:00 i.e. a 12 hour day. The site gates will be closed to vehicular access outside these hours with only authorised personnel on site to open the gates for emergency and regulatory access.
- 9.3 The daily fuel requirement of the plant will be a maximum of 216 tonnes and the loading bay within the building will have up to 3 days' storage capacity (approximately 650 tonnes) to ensure constant availability of fuel. The plant can be shut down if no fuel is available but down time, other than for planned essential maintenance, is costly and reduces the overall electricity generation.
- 9.4 As the fuel is processed within the building it will be delivered in bulk vehicles with a payload of between 15 and 20 tonnes. For ease of calculation and as a worst case scenario an average of a 15 tonne load is assumed, which gives a net requirement of 15 loads of fuel per day. Over a 12 hour working day the deliveries equate to an average of less than 2 deliveries per hour. Even if deliveries were restricted to weekdays there would be 20 loads per day maximum i.e. less than 2 per hour. The surrounding road network has sufficient capacity to meet these movements. However, the applicant has agreed to unload a minimum of 20,000 tonnes of wood by boat at the dock facility, which will save over 1,333 vehicle movements. This is likely to reduce the weekly input by road by 385 tonnes i.e. 20 - 25 vehicle movements per week. Over the entire year the inputs by road are expected to be between 50 - 67 loads per week i.e. 10 - 13 per day for a 5 day week.
- 9.5 The additional 3 days' storage capacity will be built up during commissioning and will be topped up by an additional 2 loads per day over a month long period after which movements will reduce to normal.
- 9.6 It is anticipated that in addition to staff cars approximately 4 cars (8 movements) will visit the site during a normal working day.
- 9.7 The best practicable means will be used in all waste handling and other operations to ensure that noise levels do not exceed agreed levels. The enclosure of the process entirely within the building and location of the storage bay within the building will ensure that noise levels are not significant.

- 9.8 The plant has been designed to meet the BAT (Best Available Technology) requirements of the Environmental Permitting regime, which include noise emissions controls. The gas engines produce the most noise, hence their enclosure within an acoustically screened compound within the building. The engine enclosure has been designed to meet a specification of 80 dB @ 1 metre outside the enclosure within the building. Additional attenuation (reduction) of 40dB will be provided by the insulated outer skin of the building.
- 9.9 The plant as a whole inside the building is designed to meet 85 dBA @ 1 metre. These levels within the building are lower than many other industrial operations. The roller shutter doors will not remain open at all times and will be opened as required for deliveries.
- 9.10 Emissions data is included in the case studies enclosed with the application. The site will not impact upon local air quality because its emissions must meet the limits set in the Environmental Permit. Some characterisation of emissions has been carried out at this plant and details are enclosed in Document reference SRB-F. The application plant must be compliant because the number of pyrolyser which form the process place it within the Environmental Permitting regime enforced by the Environment Agency (3MW +) rather than the local Environmental Health Department (<3MW). Gaining a planning consent does not authorise the operation, it must still have a permit and agreed abatement technology before it can operate. Not only does the plant have to meet strict emission criteria it must also be the Best Available Technology (BAT) for the use.



Appendix 12

Policy Review

1.0 POLICIES AND LEGISLATION

- 1.1 The following section outlines the policies relevant to the application site and addresses the issues as required. As well as requiring planning consent the application proposals will also require a PPC Permit, issued by the Environment Agency. The applicant proposes to apply for the permit after the planning application has being considered.

NATIONAL POLICIES

- 2.1 Energy policy is a reserved function that is not devolved to the Assembly Government. Nevertheless, all decisions relating to renewable energy in Wales must take account of the Assembly Government's policy. Government policy with regard to waste management is constantly changing to keep pace with EC legislation and best environmental practice and numerous documents provide guidance and assistance to planning authorities when determining waste planning applications.
- 2.2 Ministerial Interim Planning Policy Statement 01/2005 (MIPPS) replaces Planning Policy Wales (PPW) sections 12.8 to 12.10 which relate to renewable energy. Until PPW is reviewed, the MIPPS replaces those sections. MIPPS sets renewable electricity targets for Wales of 4TWh per annum by 2010 and 7 TWh per annum by 2020.
- 2.3 MIPPS states that it is the Assembly Government's aim to secure an appropriate mix of energy provision for Wales by means of strengthening renewable energy production. MIPPS also states that, for the purposes of this policy, the definition of renewable energy includes biomass. MIPPS states that biomass is generally regarded as fuel (other than fossil fuel) the energy content of which is derived organically from plant or animal matter.
- 2.4 MIPPS also states that LPAs are encouraged to facilitate the development of all forms of renewable energy by:
- i) Considering the contribution that their LPA area can make towards developing and facilitating renewable energy.
 - ii) Ensuring decisions are consistent with national / international climate change obligations, including contribution to renewable energy targets, having regard to national policy on levels of renewable energy required.
 - iii) Recognising the environmental, economic and social opportunities that renewable energy provides to wider planning goals and delivery of renewable energy targets.

- 2.5 Technical Advice Note 8 (Renewable Energy) (TAN8) refers to the Renewables Obligation 2002 which states that only electricity derived from biomass will be eligible for Renewables Obligations Certificates. Biomass is defined in this context as a fuel of which at least 98% of the energy content is derived from plant or animal matter or substances derived directly or indirectly therefrom (whether or not such matters or substances are waste) and includes forestry or wood waste.
- 2.6 The implementation of the EC Landfill Directive by the Landfill Regulations (England and Wales) 2002 has restricted the waste types which can be landfilled and requires pretreatment of certain wastes before deposit, making landfill a more costly disposal operation than in previous years. Since October 2007 all non-hazardous wastes, with limited exceptions, have required pre-treatment prior to deposit in landfill. It is expected that this requirement will have a significant increase in the volume of wood recycled in the UK.
- 2.7 Recent research quoted in the Waste Strategy 2007 consultation document estimated that 7.5 million tonnes of waste wood arisings in the UK 80% is landfilled, 16% reused and recycled and 4% used in energy recovery. The current market for recycled wood products is reaching saturation point in some areas as many of the recyclers have sufficient supply for their needs and recycled timber cannot be composted or used for some of the uses shown in the WRAP Wood Recycling Guide (see *SRB-1* in supporting documents).
- 2.8 The UK Government, in its response to the report of Sir Ben Gill's task force on Biomass Energy, acknowledged the case for extracting more energy from waste wood but wished to ensure that no wood was burned which could be recycled. Given the figures in 4.2.7 above it is likely that a significant number of Biomass plants will be needed throughout the UK.
- 2.9 The introduction of the aggregate tax, the continuing increases in landfill tax (£32.00/tonne in April 2008 rising to £48.00/tonne in 2010) and landfill tipping prices are all factors which will effectively encourage the diversion of wood waste away from landfill.

3.0 REGIONAL POLICIES


- 3.1 The adopted regional policy is shaped by the South Wales Regional Waste Plan. It sets out six different options for dealing with the region's waste, all of which include energy from waste. The 1st Review document acknowledges that waste cannot continue to be landfilled. Residual waste that cannot be recycled is dealt with in the 1st Review document and energy generation is regarded as one of the ways that this type of waste should be dealt with. The seven sub-options identified all have a common 'front end' recycling and composting rate and all options identified include the use of energy from waste. The 1st Review acknowledges that 'energy from waste' has a clear role to play in any sustainable waste management strategy. The 1st Review also acknowledges that the majority of waste management facilities could be located on planning use class B2 sites, with some being on B1 and B8 sites.

4.0 LOCAL POLICIES

4.1 Vale of Glamorgan Council adopted the Unitary Development Plan in 2005 - It is considered that the proposal complies with the following policies of the UDP as follows:-

- i) Policy 2:
The proposal will contribute to waste reduction or recycling.
- ii) Policy 13:
Waste Management Facilities - The proposal will provide the best sustainable waste management option for the fractions of materials being dealt with. The proposal will be dealing with wood that cannot be recycled due to market saturation. It is the next best available option for the wood to be dealt with in the waste hierarchy, avoiding the need for landfill. In terms of the proximity principle the waste arisings will be from the sub-region and being located within one of the principle urban areas of South East Wales, the proposal is situated within close proximity to one of the main sources of waste arisings.
- iii) COMM 8:
New infrastructure will be provided. However, it will not have an unacceptable impact upon identified environmental interests.
- iv) ENV 6:
The proposal is in context with the existing industrial surroundings, and will not cause unacceptable environmental effects.
- v) ENV 7:
Surrounding natural water bodies will not be affected by this development, and the proposal was confirmed not to pose a flood risk by Matthew Parry of the EAW during pre-application correspondence (see SRB-J RSK Flood Risk Assessment).
- vi) ENV 11:
This biomass plant will not unacceptably affect features of importance to landscape or nature conservation in the area.
- vii) ENV 28:
Appropriate site access for disabled persons has been designed in accordance with Section 76 of the Town and Country Planning Act 1990.
- viii) EMP 1:
The proposed use is likely classed as B2, therefore meeting the requirements of the land allocated at Barry Docks for use classes B1, B2 and B8. A small number of local jobs will also be created with this development.
- ix) EMP 2:
The proposal meets the criteria required to permit new business and industrial development.

- x) EMP 3:
The proposal is a biomass facility, likely to be classed as B2 as it is energy generation (as defined by Town and Country Planning [use classes] Order 1987 [as amended]).
- xi) TRAN 10:
A sufficient number and type of parking is provided on site in accordance with the national parking guidelines.
- xii) WAST 1:
The proposed site is on land allocated for B2 use.
- xiii) WAST 2:
The proposal fulfills the 'proximity principle' and is appropriate for the size of the site located within an industrial area. It is also well placed for access to the surrounding road network. The ancillary equipment will be sited to be as unobtrusive as possible. Any electricity connections will be underground. The building where the plant and equipment will be located will be acoustically screened keeping noise levels to a minimum. There are no residential properties nearby. The main sources of noise (the engines) will all be located within the building. Externally the main source of noise will be from fans and these will be sited to minimise any potential noise impacts upon neighbouring uses. Drainage will be provided to ensure safe disposal of water.



Appendix 13 Sustainability Appraisal

SUSTAINABILITY STATEMENT

Site: Barry Docks, Woodham Road, Barry
Application: Erection of New Industrial Building and Installation of
9MW Wood Fuelled Renewable Energy Plant

- 1.0 The purpose of this document is to demonstrate that the proposed biomass plant on land at Woodham Road contributes towards sustainable development in terms of land-use planning, accessibility, energy efficiency, drainage and water conservation, waste management, landscape and biodiversity.
- 2.0 The document is written with regard to The Vale of Glamorgan guidance entitled "Sustainable Development - Supplementary Planning Guidance", which gives advice on the implementation of renewable energy systems, and the planning considerations of such development, which are also considered herein.
- 3.0 The Brundtland Report was published by the UK Government in 1987 under the title "Our Common Future". The report defined sustainable development as:
- "Development which meets the needs of the present without compromising the ability of future generations to meet their own needs."*
- 4.0 The guidance is written in keeping with the philosophy of "think globally, act locally", and steers the Council towards encouraging development which can minimise negative environmental impacts and make best use of natural resources. The use of wood based fuel for a biomass energy plant is consistent with these aims. Furthermore TAN 8 (Planning for Renewable Energy) highlights the potential for creating more sustainable developments by incorporation of renewable energy technologies.

5.0 Site Assessment and Selection

- 5.1 Prior to preparation of the application an initial site assessment was undertaken to gain an understanding of the site in relation to the design. The applicant has submitted applications for a further 3 sites of the same size and design at other UK ports. The application in Hull has been granted for the same site design, in a similar setting.
- 5.2 Numerous sites have been considered throughout the UK, with site selection being dependent upon several site specific factors i.e.
- i. The applicant's preference for brownfield sites.
 - ii. The requirement for a cost effective/existing connection to the National Grid
 - iii. Availability of fuel supply, including the potential for 20 % to be delivered by boat via the port.
 - iv. The site being accessible to local services and public transport routes.

- v. The site having reasonable highway accessibility, although it is of low impact given the number of vehicle movements required.
- vi. Potential for customers nearby to utilise the waste heat generated by the plant.
- vii. No impact upon the local ecology.
- viii. Ability to secure a long term lease.

6.0 Site Layout and density

- 6.1 The site layout is constrained by the width of the site but fortunately the design of the building was able to accommodate the biomass plant whilst maintaining a orientation which provides for optimum natural lighting via rooflights.
- 6.2 The site will incorporate rainwater harvesting in the final design and all of the plant and equipment has been housed in a single building, maximising the use of building materials.
- 6.3 The development proposal will bring a part derelict, low grade site into productive use which will provide employment, renewable energy and a source of renewable heat.
- 6.4 The site has a low lighting requirement as most operations will be carried out in daylight hours. The proposal to cease importation of fuel by 1900 hours reduces the need to light the site after that time as the only access will be staff carrying out security checks and changes in shifts patterns.

7.0 Transport and Movement

- 7.1 The development provides for easy and safe movement for all modes of transport, especially pedestrians and cyclists and connections to existing public transport routes beyond the immediate development.
- 7.2 The site proposal promotes the transport user hierarchy stated in the guidance. Employees will be encouraged to cycle to work, which is the most realistic option given the industrial nature of the site.
- 7.3 The application proposals estimate that 8 jobs will be created by the development and its is anticipated that most of the job applicants will be local to the site.
- 7.4 The site makes provision for disabled access and parking which is demonstrated in the planning application documentation (planning statement, site layout plan and design and access statement)
- 7.5 The site will not create new roads and utilises an existing access. The site will have a speed limit of 5mph for all vehicles for enhanced safety.
- 7.6 Parking is situated to ensure that pedestrian access to the building does not cross the site frontage where vehicles and loading plant are in use. Parking provision is also open and secure.
- 7.7 The site is conveniently located near local bus and rail routes (Barry Dock Station).

8.0 Energy Conservation and Efficiency

- 8.1 The guidance states that energy use in buildings accounts for nearly 50% of carbon dioxide emissions within the UK. The biomass plant will produce renewable energy and the building will be constructed to a high standard but will not require heating as the heat produced by the process will ensure that no additional heating is required.
- 8.2 Rather than provide a boiler to heat water on site for the welfare facilities waste heat from the process will be used.
- 8.3 All electrical appliances on site will be energy efficient. If a fridge is used in staff welfare facilities it will have the lowest energy rating available and all lighting on site will be energy efficient. The building has provision for roof lights to provide natural light during day time operations. The rooflights are also a form of passive solar design being oriented to the East and West elevations of the building to receive the maximum amount of sunlight, within the constraints of the positioning of the building.
- 8.4 Although the technology proposed is new and innovative the overall concept is not a new one. Combined Heat and Power (CHP) has far greater efficiency than traditional power generation methods and provides for the heat produced during power generation to be captured and used in local heating applications. Wood chip and pellet stoves and boilers have been developed for domestic, agricultural and industrial uses, and have been used to heat the WAG Debating Chamber.
- 8.5 The site will use efficient gas combustion engines.
- 8.6 The site has a projected life of a minimum of 25 years. The materials to be used in construction of the building will be selected for quality and durability. Where possible materials will be selected which have low embodied energy. Where possible, timber used on site will be sourced from sustainably managed forests and carrying the Forestry Stewardship Council (FSC) logo.
- 8.7 The location of the site makes the reuse of waste heat possible for commercial and domestic purposes. The 23 industrial units adjacent to the site and the proposed Barry Waterfront Development could benefit from the waste heat.

9.0 Low/Zero Carbon Energy Sources and Systems

- 9.1 The proposed fuel for the site is a low carbon source as it contains 'new carbon' rather than carbon from fossil sources.
- 9.2 The proposal diverts wood away from landfill, thereby reducing methane emissions and having a net effect upon climate change as methane has 25 times the global warming potential of carbon dioxide.

10.0 Water Conservation and Sustainable Drainage

- 10.1 Industry is the heaviest consumer of water in the UK. Although the biomass plant has a net water requirement the majority is introduced into the process via the moisture content of the wood fuel (15-35%).
- 10.2 Rather than using treated drinking water on site the applicant proposes to re-use roof water and treat the water arising from the process to enable its recirculation through the process.
- 10.3 The applicant is willing to agree to the construction of a sustainable drainage system. Although the site is not within the floodplain but included the following sustainable drainage measures:
- i. Soakaways - vegetated area proposed along the Southern site boundary.
 - ii. Permeable Surfacing Materials such as crushed stone/gravel or porous asphalt will also be used to encourage surface water to permeate into the ground.

11.0 Waste Management

- 11.1 The development provides for on-site storage of all waste generated from the process and the planning application statement (Section 9.0) lists the wastes to be generated, their volumes and intended destinations. The application document SRB-C Waste Audit and Facilities Strategy states the measures to be taken to minimise construction waste.

12. Landscape, Trees and Ecology

- 12.1 The site has very little in the way of vegetation on site and which is in an extremely poor condition. The site has been used for fly tipping and the storage of containers and waste on site has encroached upon the scrub vegetation present. The submission of a landscaping scheme will provide a greater density of planting than is currently present.
- 12.2 The developer is willing to agree to a planning condition requiring the submission of a planting scheme for the site. The agreed scheme will comprise locally sourced native species, including trees, appropriate to the local ecology.
- 12.3 The proposed use will not impact upon any nature sites with a local or statutory designation. There are no existing ecological features on site, however, the planting scheme will provide for greater biodiversity than the current state of the site affords.

13.0 Sustainability Checklist

13.1 The Sustainability Checklist has been completed and is appended to this document as annex A.

Sustainability Checklist

This checklist will help you to identify how your development proposal addresses the issues of sustainable development contained within this SPG. Once complete the information can be used as an aid when drafting your Statement of Sustainability. The Statement of Sustainability and the Checklist should be submitted with your planning application. This will be taken into account in considering your planning application. Please feel free to continue on separate sheets if necessary.

How to use the checklist

Each sustainability issue has at least one box to fill in. If you have included measures that address the issue, complete the box with a , if not mark the box with a . For each response you are required to either state the measure proposed or your justification for not addressing this issue (e.g. the orientation of the site may not be suited to utilising the benefits of solar gain.) You are advised that the Council may request further information that supports your justification.

Sustainable Measure	<input type="checkbox"/>	Tick box if you have taken this into account If Yes, what measures are proposed? If NO, or not applicable, state why not
Site Assessment (pages 9-10)		
Accessibility to neighbouring developments, local services and facilities	<input checked="" type="checkbox"/>	REFER TO TRANSPORT PLAN (SRB-K)
Connections to existing pedestrian, cycle, rights of way and public transport routes	<input checked="" type="checkbox"/>	REFER TO TRANSPORT PLAN (SRB-K)
Existing infrastructure and its capacity	<input checked="" type="checkbox"/>	DEVELOPMENT WILL INVOLVE CLEARING THE SITE
Topography and site orientation	<input checked="" type="checkbox"/>	TOPOGRAPHY WILL NOT CHANGE
Archaeological or historic interests	<input checked="" type="checkbox"/>	NONE KNOWN
Boundary features, such as hedges, stone walls and tree lines	<input checked="" type="checkbox"/>	NO IMPORTANT BOUNDARY FEATURES. PLANTING SCHEME PROPOSED.
Local building characteristics and important views	<input checked="" type="checkbox"/>	NO SIGNIFICANT BUILDINGS ON SITE/ADJACENT
Ecological impacts assessed	<input checked="" type="checkbox"/>	SITE DISCUSSED WITH COUNCIL ECOLOGIST
Landscape/amenity impacts including trees and green spaces	<input checked="" type="checkbox"/>	LANDSCAPING SCHEME
Site Layout (page 10)		
Orientation of buildings utilises the benefits solar gain	<input checked="" type="checkbox"/>	ROOFLIGHTS MAXIMIZE SUNLIGHT
Infrastructure layout accords to the transport user hierarchy	<input checked="" type="checkbox"/>	PROVISION IS MADE FOR CYCLE PARKING
Maintains or improves existing pedestrian and cycle network	<input checked="" type="checkbox"/>	SITE IS ACCESSIBLE BY CYCLE
Allow for easy and safe access to public open spaces?	<input type="checkbox"/>	N/A - INDUSTRIAL AREA
Street lighting designed to reduce light pollution and other environmental impacts	<input checked="" type="checkbox"/>	NO STREET LIGHTING PROPOSED. SITE FLOODLIGHTS WILL ONLY ILLUMINATE OPERATIONAL AREAS

Transport and Movement (pages 10 - 11)		
Safe movement for children, pedestrians and disabled persons	✓	DISABLED PARKING. SEE DESIGN ACCESS STATEMENT
Provisions made for cyclists e.g. secure cycle storage	✓	PROVISION SHOWN ON DRAWING No. SRB-03
Encourages public transport use	✓	CLOSE TO PUBLIC TRANSPORT (BUS ROUTE)
Maintain the transport user hierarchy	✓	EMPLOYEES WILL BE ENCOURAGED TO CYCLE TO WORK.
Sustainable Energy Use (pages 11 - 13)		
Undertake an Eco-Homes, BREAM, or NHER standards assessment to determine the overall environmental performance of the proposal	X	NOT APPLICABLE
An EcoHomes Assessment is required for affordable housing funded through Social Housing Grant	X	NOT APPLICABLE
BREEAM Assessment is required for WAG procured buildings	X	" "
Passive solar design	✓	LOW LIGHTING
Natural daylighting	✓	" "
Natural ventilation	X	NOT APPLICABLE
Reduce energy consumption e.g. installation of A rated appliances, condensing boilers etc	✓	USE LOWEST RATED FRIDGE IN CANTEN
Provision of internal drying space or external communal drying area	X	NOT APPLICABLE
Renewable Energy Sources (page 13 - 15)		
Solar Photovoltaics (PV's)	X	NOT APPLICABLE
Solar Water Heating	X	" "
Small scale wind	X	" "
Biomass	✓	SITE IS A BIOMASS ENERGY PLANT
Combined Heat and Power (CHP)	✓	HEAT WILL BE REUSED
Geo thermal	X	NOT APPLICABLE
Energy Efficiency and Material Choice (page 15)		
Use reclaimed or recycled materials	✓	WHERE POSSIBLE
Materials sourced from sustainable resources e.g. FSC certified timber	✓	" "
Use natural energy efficient materials e.g. timber, stone etc	X	" "
Sustainable construction techniques e.g. straw bale, green roofing etc	X	NOT APPLICABLE
Street Lighting (page 15)		
Low energy street and other external lighting	✓	LOW ENERGY SECURITY LIGHTING

Water Conservation (pages 15-16)		
Installation of dual water supplies e.g. rainwater run-off for toilets and/or grey water reuse	✓	RAIN WATER TO BE REUSED
Installation of low/dual flush toilets	✓	DUAL FLUSH USING 'GREY WATER'
Installation of rain water collectors for landscape maintenance and/or domestic garden use	✓	RAIN WATER COLLECTION TANK
Installation of water efficient A rated white goods	X	NO WATER USAGE WHITE GOODS PROPOSED
Use natural techniques, such as a reed bed filtration system to treat waste water	X	WASTE WATER TO BE TREATED + REUSED
Sustainable Drainage (pages 17-18)		
Installation of Sustainable Urban Drainage	✓	REFER TO FRA/EIA CONSULTATION
Soakaways	✓	" " "
Permeable surfacing	✓	" " "
Swales and Basins	X	NOT APPLICABLE TO THE DEVELOPMENT
Infiltration Trenches and Filter Drains	X	" " "
Pond and Wetlands	X	" " "
Onsite Stormwater Detention	X	SUSTAINABLE DRAINAGE
Green Roofs	X	NOT APPLICABLE
Waste Management (pages 18-19)		
Internal recycling/separation facilities	✓	THE SITE IS AN ENERGY/RECYCLING DEVELOPMENT
Communal external recycling/separation facilities	X	NOT APPLICABLE
Re-use/recycle existing building materials	X	NO EXISTING MATERIALS ON SITE. REUSE WHERE AVAILABLE
Implementation of an on site waste management scheme during construction	✓	SITE WASTE MANAGEMENT PLAN
Landscape, Trees and Ecology (pages 19-21)		
EIA of other ecological assessment/surveys conducted	X	} THE SITE IS A PART DERELICT SITE ON MADE GROUND, THE DEVELOPMENT WILL ENHANCE BIODIVERSITY ON SITE BY USING LOCAL SPECIES IN THE PLANTING SCHEME.
Retention of existing trees as part of the site layout/landscaping scheme	X	
Incorporation of ecological mitigation or compensation measures	X	
Creation of new wildlife habitats	X	
Inclusion of post-development management, monitoring and review	X	
Retention/enhancement of existing landscaping features	X	
Plant locally sourced indigenous trees and plants	✓	PROPOSED PLANTING SCHEME
Minimise the opportunities of crime	✓	SECURE BUILDING - 24 HOUR SECURITY
Mixed use development proposed	X	NOT MIXED USE



Appendix 14 Report into Dispersion Modelling of
Emissions to Air

**DISPERSION MODELLING OF EMISSIONS TO AIR FROM A
PROPOSED BIOMASS POWER PLANT
IN BARRY, SOUTH WALES**

Prepared for

SUNRISE RENEWABLES

MARCH 2009



RSK GENERAL NOTES


Project No: 660003

Title: DISPERSION MODELLING OF EMISSIONS TO AIR FROM
A PROPOSED BIOMASS PLANT IN BARRY, SOUTH
WALES

Client: Sunrise Renewables

Issue Date: FINAL

Issuing Office: Hemel Hempstead

Authorised by:  Project Author Date: 20.03.2009

Authorised by:  Project OA Rep Date: 20.03.2009

RSK EHS Ltd (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of RSK and the party for whom it was prepared.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the Safety, Health, Environment and Quality (SHEQ) Management System of RSK.

EXECUTIVE SUMMARY

RSK EHS Ltd (RSK) were commissioned by Sunrise Renewables to undertake an air quality assessment for the proposed 9MW biomass plant located in Barry, South Wales. The plant has been designed to pyrolyse fuel derived from waste wood to produce syngas, which is then used as fuel in gas engines to generate electricity.

Air quality impacts in terms of key pollutant concentrations resulting from operation of the proposed biomass plant have been assessed using an advanced dispersion model 'AERMOD'. The predictive assessment established that under the worst-case operational scenario, there will be no exceedence of relevant air quality standards designed for the protection of human health.

At all protected/designated ecological sites within 10 km of the proposed development, the annual average NO_x concentrations are predicted to meet the relevant air quality standard for the protection of vegetation and ecosystems.

The predicted nitrogen and acid deposition rates are less than 1% of the background deposition rate. Where exceedence of critical nitrogen deposition load was identified, such exceedences are due to predominant background deposition rates and the highest process contribution at such locations is less than 1% of the lower critical load.

Following the comments from the Vale of Glamorgan Council on the draft air quality assessment report for the proposed development, in-combination impacts resulting from operation of the proposed biomass plant along with the nearby proposed Biogen gasification facility have also been assessed. The cumulative assessment identified that the resulting increase in pollutant concentrations is marginal and impacts are insignificant.

Air quality impacts resulting from the operation of the proposed biomass plant are not considered to be significant.

Glossary

AQS	Air Quality Strategy
CO	Carbon monoxide
EU	European Union
HCl	Hydrogen Chloride
HF	Hydrogen Fluoride
Hg	Mercury
IPPC	Integrated Pollution, Prevention & Control
NAQS	National Air Quality Strategy
NO _x	Oxides of nitrogen
NO ₂	Nitrogen dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TOC	Total Organic Carbon

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1. INTRODUCTION

1.1 Scope

RSK Environment, Health and Safety Ltd (RSK) were commissioned by Sunrise Renewables to undertake an air quality impact assessment of combustion emissions from a proposed 9 MWe biomass power plant in Barry, South Wales. The plant has been designed to pyrolyse fuel derived from waste wood to produce syngas, which is then used as fuel in gas engines to generate electricity. Detailed dispersion modelling of stack emissions from the proposed plant was undertaken in response to comments by the relevant local authority, the Vale of Glamorgan Council (VGC), to identify potential air quality impacts. In particular, the potential impact of operational emissions on local residential and ecological receptors, including Sites of Special Scientific Interest (SSSI).

VGC made the following comments on the air quality aspects of the proposed development.

"Specific details on the types and sources of wood to be used as fuel including details on the quality control of the feedstock (with reference to the potential impact on emissions to air).

Details of all point source and fugitive emissions to air, including stack height calculations, stack dimensions and characteristics (e.g. flow, temp, efflux velocity).

Details on the types and considerations of emissions from all sources including products of combustion and those attributable to varying wood quality sources. Details should be provided of expected emissions during abnormal operating conditions (e.g. start-up, emergency situations). This information should be combined with an impact assessment on local air quality which should include the Air Quality Objective pollutants and any other substances which have the potential to impact on the area. The assessment should take account of the elevated position of the residences on Dock View Road".

Subsequently, RSK have contacted the concerned officer on 6th January 2009 at the VGC with a proposed air quality assessment methodology. The Council's Pollution Control Officer, Mr Jon Bailes informed RSK that the proposed methodology is acceptable, subjected to the condition that additional sensitive receptor locations are included in the assessment. The abovementioned comments, along with comments on the proposed methodology from VGC have been taken into account in assessing the air quality impacts. The comments concerning the types and sources of wood have been addressed in the main application document and hence not reported here. Elevated position of the residences on Dock View Road has been taken into account by using terrain elevation data in the air dispersion modelling.

RSK have completed the air quality assessment for the proposed development after taking the aforementioned comments from the VGC and submitted the assessment report. The Principal Planning Officer (Development Control) at the VGC, Mr. Steve Ball has suggested on 13th March 2009 that in-combination impacts of operation of the proposed biomass plant along with the

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nearby Biogen gasification plant should also be assessed. RSK have predicted the in-combination impacts and the outcomes of this cumulative impact assessment are included in this report.

The dispersion modelling assessment, the outcomes of which are presented in this report, takes into account, and includes a discussion of, the following key parameters/elements. It should be noted that the results presented in the main report are based on a stack height of 20 m. A full stack height appraisal is presented in Appendix 1.

- Ambient/background levels;
- Assessment criteria;
- Emission parameters;
- Modelling domain/receptors;
- Meteorology/surface characteristics;
- Influence of buildings;
- Sensitivity analysis;
- Cumulative impact assessment;
- Assumptions relating to pollutant conversion processes (e.g. NO_x/NO₂ photochemistry) for different averaging periods;
- Results in tabular form, identifying environmental concentrations (process plus background) in comparison with relevant assessment criteria and locations of maximum air quality impacts and the process contribution to this; and,
- Contour plots of predicted NO_x/NO₂, SO₂ and CO ground level concentrations (GLCs).

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1.2 Site Description

The proposed 9 MWe biomass power plant will be located within the administrative boundary of the Vale of Glamorgan Council (VGC). Specifically, the power plant will be situated at the junction of Woodham Road and David Davies Road, Barry Docks, Barry, South Wales, as shown below in Figure 1-1. The national grid reference for the approximate centre of the site is 312467, 167668.

Figure 1-1: Location of Proposed Biomass Plant



2. ASSESSMENT METHODOLOGY

2.1 Legislation and Assessment Criteria

UK air quality policy is published under the umbrella of the Environment Act, 1995, Part IV and specifically Section 80, the National Air Quality Strategy (NAQS). The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working Together for Clean Air, published in July 2007, sets air quality standards and objectives for ten key air pollutants to be achieved between 2003 and 2010.

The air quality standards in the UK are derived from European Commission (EC) Directives. The EU Air Quality Framework Directive (1996)⁽¹⁾ established a framework under which the EU could set limit or target values for specified pollutants. The Directive identified twelve pollutants for which limit or target values have or will be set in subsequent Daughter Directives. The first of these Daughter Directives⁽²⁾, relating to sulphur dioxide (SO₂), fine particles (PM₁₀), oxides of nitrogen (NO_x) and lead (Pb), was formally adopted in April 1999, and was required to be implemented by all Member States by July 2001.

Relevant regulations applicable in Wales include:

- The Air Quality (Wales) Regulations 2000 (S.I. 2000/1940) (W.138);
- The Air Quality (Amendment) (Wales) Regulations 2002 (S.I. 2002/3182) (W.298);
- The Air Quality Limit Values (Wales) Regulations 2001 (S.I. 2001/2683) (W.224);
- Air Quality Limit Values (Wales) Regulations 2002 (S.I. 2002/3183) (W.299);
- The Air Quality (Ozone) (Wales) Regulations 2003 (S.I. 2003/1848) (W.198);
- The Air Quality Limit Values Regulations (2003) (S.I. 2003/2121);
- The Air Quality Limit Values (Wales) (Amendment) Regulations 2005 (S.I. 2005/1157) (W.74);
and,
- The Air Quality Standards (Wales) Regulations (2007) (S.I. 2007/717) (W.63).

¹ Council Directive 1996/62/EC Framework Directive on Ambient Air Quality Assessment and Management 27 Sept 1996.

² Council Directive 1999/30/EC of 22 April 1999 relating to limit values for SO₂, NO₂, NO_x, particulate matter and lead in ambient air.

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The primary emission components of concern resulting from the combustion of syngas in the proposed power plant are considered to be nitrogen oxides (NO_x), sulphur dioxide (SO₂), fine particles (PM₁₀) and carbon monoxide (CO). These parameters are subject to the air quality objectives set out in the UK National Air Quality Strategy (NAQS), as presented below in Table 2-1. Other emissions including dioxins, hydrogen chloride (HCl), hydrogen fluoride (HF) and mercury (Hg) are not considered to be significant.

In addition to the UK NAQS, the Environment Agency's Integrated Pollution Prevention and Control Horizontal Guidance Note 1 (IPPC H1, 2003) provides environmental benchmarks for the protection of human health for hydrogen chloride (HCl), hydrogen fluoride (HF) and mercury (Hg) as identified in Table 2-2. Both HCl and HF have the potential to contribute to acid deposition effects. No guideline level is available for dioxins.

Table 2-1: UK National Air Quality Strategy Objectives

Emission Parameter	Intention	Period of Exposure	Air Quality Objective	Attainment Date
NO ₂	Protection of human health	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times per calendar year (99.79th percentile)	31 December 2005
	Protection of human health	Annual mean	40 µg/m ³	31 December 2005
NO _x	Protection of ecosystem health	Annual mean	30 µg/m ³	31 December 2000
CO	Protection of human health	Running 8-hour mean	10 mg/m ³	1 December 2003
Particles PM ₁₀	Protection of human health	24-hour mean	50 µg/m ³	31 December 2004
	Protection of human health	Annual mean	40 µg/m ³	31 December 2004
SO ₂	Protection of human health	15-min mean	266 µg/m ³	31 December 2005
	Protection of human health	1-hour mean	350 µg/m ³	31 December 2004
	Protection of human health	24-hour mean	125 µg/m ³	31 December 2004
	Protection of ecosystem health	Annual mean	20 µg/m ³	31 December 2000

Table 2-2 Environmental Benchmarks for HCl and HF

Emission Parameter	Intention	Period of Exposure	Air Quality Objective
HCl	Protection of human health	1-hour mean	800 µg/m ³
		Annual mean	20 µg/m ³
HF	Protection of human health	1-hour mean	250 µg/m ³
Hg	Protection of human health	1-hour mean	7.5 µg/m ³
	Protection of human health	Annual mean	0.25 µg/m ³

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2.2 Baseline Air Quality

2.2.1 UK Air Quality Archive Data

The UK Air Quality Archive, which is maintained by AEA on behalf of DEFRA (Department for Environment, Food and Rural Affairs) and the devolved administrations, provides predicted background air quality maps that can be used in air quality modelling studies to represent background concentrations of pollutants of concern. The maps combine air quality monitoring data with the output from predictive modelling, which includes emissions from arterial roads and major industries, to provide predicted background pollutant concentrations on a 1 km by 1 km grid basis across the UK.

Predicted/mapped background air quality at the biomass plant site for the base case year of 2008 and the anticipated opening year of 2010 is presented below in Table 2-3. Background NO_x, NO₂ and PM₁₀ data for 2008 and 2010 were appropriately adjusted from 2005 base data using the Year Adjustment Calculator (also available at the UK Air Quality Archive). Background CO concentrations for 2008 and 2010 were adjusted from 2001 base data. The background SO₂ concentration for 2008 and 2010 was obtained from 2001 base data. No year conversion factors were available for this parameter.

Background concentrations of pollutants of concern are well below the national air quality standards protective of human health. Furthermore, background concentrations are predicted to fall over time at the proposed site.

Table 2-3 Estimated/Mapped Annual Average Background Pollutant Concentrations (µg /m³)

Pollutant	2008	2010	Air Quality Objective
Nitrogen Dioxide (NO ₂)	14.7	12.1	40
Nitrogen Oxides (NO _x)	16.6	15.4	30
Carbon Monoxide (CO)	127.8	113.5	10,000
Sulphur Dioxide (SO ₂)	3.6	3.6	20
Particles (PM ₁₀)	15.5	15.3	40

Notes: NO_x air quality objective is set for the protection of vegetation and ecosystems only; presented concentrations are for 1 km by 1 km grid square centred at grid reference: 312500, 167500 (approximate location of centre of the site: 312647, 167668).

2.2.2 Local Authority Air Quality Review and Assessment

As required by the Environment Act 1995, local authorities are obligated to review and assess air quality with respect to the standards and objectives for the pollutants specified in the Government's National Air Quality Strategy (NAQS). Local authorities are required to carry out an Updating and Screening Assessment (USA) of their area every three years. If the USA identifies potential hotspot areas where air quality objectives are likely to be exceeded, then a detailed assessment of those areas is required. Where objectives are not predicted to be met, local authorities must declare the area as an Air Quality Management Area (AQMA). In addition, local authorities are required to produce an Air Quality Action Plan (AQAP), which includes measures to improve air quality within the AQMA.

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The Vale of Glamorgan Council (VGC), the relevant local authority, has reviewed air quality within its administrative boundary, and has not declared any AQMAs. Passive diffusion tube and automatic air quality monitoring is carried out within the VGC area. The nearest passive and automatic monitoring locations to the proposed biomass power plant site are described below:

- Rurally located automatic monitoring station (Vale of Glamorgan Fonmon) situated approximate 6 km west of the proposed biomass plant in a car park next to the Highwayman Inn, Rhoose. This monitoring station is part of the Welsh Automatic Rural Pollution Monitoring Network; and,
- An intermediate NO₂ diffusion tube site located at St. Teilo Avenue, Barry (approximately 1.5 km north of the proposed biomass plant).

Table 2-4 below presents 2007 annual average NO_x, NO₂, SO₂ and PM₁₀ data as measured at the two monitoring stations. Relevant air quality objectives were met at both sites in 2007.

Table 2-4 2007 Annual Average Air Quality Monitoring Data from the Vale of Glamorgan Fonmon Automatic Monitoring Station and the St. Teilo Avenue Diffusion Tube Monitoring Site

Monitoring Locations	2007 Annual Average NO _x Concentration (µg/m ³)	2007 Annual Average NO ₂ Concentration (µg/m ³)	2007 Annual Average SO ₂ Concentration (µg/m ³)	2007 Annual Average PM ₁₀ Concentration (µg/m ³)
Vale of Glamorgan Fonmon Automatic Station	16.4	11.9	3.6	19.6
Diffusion Tube at St. Teilo Avenue	No Data	17.0	No Data	No Data
Air Quality Objectives	30	40	20	40

2.2.3 Background Air Quality Data Included in the Assessment

Table 2-5 below summarises the background air quality data employed in the dispersion modelling assessment. Estimated (2010) annual average pollutant concentrations are derived from a combination of sources, including the UK Air Quality Archive and the nearest automatic and diffusion tube monitoring stations to the proposed biomass plant. Where appropriate, the data have been adjusted for the future year of 2010 by applying relevant LAQM TG(03) year adjustment factors.

Table 2-5 Estimated 2010 Annual Average Pollutant Concentrations

	NO _x (µg/m ³)	NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)	CO (µg/m ³)	SO ₂ (µg/m ³)
UK Air Quality Archive	15.4	12.1	15.3	113.5	3.6
Vale of Glamorgan Fonmon Automatic Station	14.3	10.9	18.5	-	3.6
St. Teilo NO ₂ Diffusion Tube	19.9 (derived from NO ₂ measurement)	15.2	-	-	-

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In this assessment, the 2010 annual average background CO concentration obtained from the UK Air Quality Archive was used. 2010 annual average background PM₁₀ and SO₂ concentrations were derived from the 2007 VGC Fonmon automatic monitoring station data. The 2010 background NO₂ concentration was derived from the 2007 St. Teilo Avenue diffusion tube data. The 2010 background NO_x concentration employed in the assessment was derived from the 2007 St. Teilo Avenue NO₂ diffusion tube data by multiplying the annual average NO₂ concentration by the NO_x/NO₂ ratio from the VGC Fonmon automatic monitoring station, which is 1.31 (14.3 µg/m³/10.9 µg/m³). No background concentrations of dioxins, HCl, HF and Hg are available, however, background concentrations of these pollutants are considered to be negligible.

2.3 Model Description

AERMOD is a state-of-the-science dispersion modelling system that simulates essential atmospheric physical processes and provides refined concentration estimates over a wide range of meteorological conditions and modelling scenarios. It is based on atmospheric boundary layer turbulence structure and scaling concepts, including treatment of multiple ground-level and elevated point, area and volume sources. It handles flat, complex, rural or urban terrain and includes algorithms for building effects and plume penetration of inversions aloft. It uses Gaussian dispersion for stable atmospheric conditions (i.e. low turbulence) and non-Gaussian dispersion for unstable conditions (i.e. high turbulence).

AERMOD includes two data pre-processors for streamlining data input. AERMET, a meteorological pre-processor, computes boundary layer and other necessary parameters for use with AERMOD and accepts data from both on-site and off-site sources. AERMAP is a terrain pre-processor that simplifies the computation of receptor elevations and effective height scales for numerous types of digital data formats, including USGS 1 Degree and 7.5 minute digital elevation model (DEM) files and U.K. Ordnance Survey® digital elevation data.

Breeze AERMOD GIS Pro v.7.0.21 was used in this study for assessing potential air quality impacts. The model is considered by the UK Environment Agency to be appropriate for assessments of the nature described in this report.

2.4 Emission Source Parameters

The only significant source of emissions to air from:

- 1 X 9 MWe Biomass Plant (fuel: syngas derived from waste wood).

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As the proposed biomass plant utilizes waste wood, emissions from the plant should be compliant of the Waste Incineration Directive (WID)³. The maximum emission releases stipulated by WID are identified in Table 2-6.

Table 2-6 Emission Limit Values Stipulated By the Waste Incineration Directive

Pollutant	Emission Limit Value, mg Nm ⁻³
Nitrogen oxides (expressed as nitrogen dioxide)	200
Particulate Matter (PM10)	10
Sulphur dioxide	50
Carbon monoxide	50
Hydrogen chloride	10
Hydrogen fluoride	1
Mercury compounds (expressed as mercury)	0.05
Dioxins and Furans	0.1 ng m ⁻³

³Note: The reported values are at temperature 273°K, pressure 101.3 kPa, 11% oxygen and dry gas conditions and refer to the daily average concentration limit values.

2.4.1 Pollutant Emission Concentrations From A Similar Plant

For a similar plant of capacity 3 MW electricity generation capacity (Rhydney Organic Regeneration Facility, Hudol Thermal Treatment Unit 15, Capital Valley Industrial Estate, Rhydney, Caerphilly, NP22 5PT; The plant gasifies a range of biomass and oily sludge wastes), the Environment Agency stipulated the pollutant emission limit values identified in Table 2-7 for the key air pollutants.

Table 2-7 Pollutant Emission Concentrations Stipulated By The UK Environment Agency For Rhydney Organic Regeneration Facility

Pollutant	Pollutant Emission Concentration, mg m ⁻³	
	Daily Average Limit	Half-hourly Average Limit
Nitrogen oxides (expressed as nitrogen dioxide) (NO _x)	90	100
Particulate Matter (PM ₁₀)	7	10
Sulphur dioxide (SO ₂)	20	30
Carbon monoxide (CO)	10	15
Hydrogen Chloride (HCl)	1	16
Hydrogen Fluoride (HF)	1	4
Mercury (Hg)	0.05 mg m ⁻³ (Average over a period of 30 minutes and 8 hours)	
Dioxins and Furans	0.1 ng m ⁻³ (Average over a period of 6 and 8 hours)	

Source: Draft Permit With Introductory Note (Permit Number ZP3535MW) Issued by the UK Environment Agency.

Whilst the emissions from the proposed development are similar that identified in Table 2-7 (for a similar plant), the proposed plant will be WID compliant. To conservatively assess the air quality impacts, higher of the daily average pollutant emission concentrations (that stipulated by WID as

³ WID: The Directive on the Incineration of Waste. Also, the Environmental Permitting Guidance, Environmental Permitting (England and Wales) Regulations 2007, Department for Environment Food and Rural Affairs (DEFRA), <http://www.defra.gov.uk> .

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identified in Table 2-6) have been included in the assessment. The emission parameters included in the dispersion modelling study are summarised below in Table 2-8.

Table 2-8: Emission Parameters for Sources Included in the Dispersion Model

Emission Source	Biomass Plant
Source Location (Easting, Northing)	312647, 167668
Stack Height, m (from ground level)	20
Stack Diameter, m	0.9
Efflux Temperature, deg K	598
Efflux Velocity, m/s	14
Pollutant Emission Concentrations, mg Nm⁻³	
Nitrogen oxides NO _x (expressed as nitrogen dioxide, NO ₂)	200
Particulate Matter (PM10)	10
Sulphur dioxide	50
Carbon monoxide	50
Hydrogen chloride	10
Hydrogen fluoride	1
Mercury compounds (expressed as mercury)	0.05
Dioxins and Furans	0.1 ng m ⁻³
Pollutant Emission Rates, g/s	
NO _x	0.8132
PM ₁₀	0.0407
SO ₂	0.2033
CO	0.2033
HCl	0.0407
HF	0.0041
Hg	0.0002
Dioxins and Furans	4.07 x 10 ⁻¹⁰

Maintenance of a log of all abnormal operations and associated emissions to air will be a requirement of the Environmental Permit issued and regulated by the Environment Agency. The log will be completed during the operational phase of the development.

2.5 Modelled Scenario

In order to characterise potential worst-case air quality impacts resulting from emissions from the power plant stack, it was assumed that the plant was operating continuously throughout the year. This is considered appropriate to capture the variation in meteorological conditions over a given year and, therefore, worst-case dispersion profiles.

2.6 Modelled Domain

Two grid domains (far-field and near-field) were incorporated in the dispersion model to capture the coarse and fine scale variation in predicted pollutant concentrations with distance. Both domains were approximately centred on the proposed power plant site. The far-field domain covered an area of approximately 20 km by 20 km, and had a grid resolution/spacing of 250 m. The near-field domain covered an area of approximately 3 km by 3 km and had a grid

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resolution/spacing of 30 m. The grid reference of the southwest and northeast corner of each grid domain is identified below in Table 2-9.

Table 2-9 Extent of Modelled Grid Domains

Location	Far-field (20 km x 20 km coarse receptor grid; 250 m spacing)		Near-field (3 km x 3 km fine receptor grid; 30 m spacing)	
	x	y	x	y
Southwest corner of grid domain	302719.6	160157.8	311147	166168
Northeast corner of grid domain	322719.6	180157.8	314147	169168

2.7 Discrete Receptors

In addition to the near-field and far-field grid domains discussed above, pollutant concentrations were also predicted at all important/designated ecological sites within 10 km of the proposed power plant. The location of all assessed receptors included in the model are presented below in Table 2-10. The coordinates approximately represent the nearest point on the sensitive site to the proposed power plant. Existing and proposed residential properties close to the site were also included in the model.

Table 2-10 Discrete Receptors Included in the Dispersion Model

Receptor Name	Receptor Reference Number (As Included in Dispersion Model)	Designation	Grid Reference		Habitat for Nitrogen and Acid Deposition
			x	y	
Barry Island	1	SSSI	311182	166346	Carboniferous Limestone ¹
Cliff Wood - Golden Stairs	2	SSSI	309468	167132	Mixed Woodland
Coedydd Y Barri/Barry Woodlands	3	SSSI	309182	168632	Semi-natural Broadleaved woodland
Cog Moors	4	SSSI	315719	169204	Unimproved Grassland ²
Cosmeston Park	5	SSSI	316826	169168	Open Water, Fern, Woodland and Remnant Limestone Grassland
Cwm Cydfin, Leckwith	6	SSSI	316433	173812	Mixed Woodland
East Aberthaw Coast	7	SSSI	305039	165703	Rocky and Sandy Shore, Shingle Spits, Saltmarsh, Relict sand Dunes and Liassic Limestone Cliffs
Ely Valley	8	SSSI	311436	175715	-
Flat Holm	9	SSSI	321755	164775	Coarse Grassland ²
Hayes Point to Bendrick Rock	10	SSSI	312968	166811	Wave-Rippled Siltstones and Fine Sandstones ³
Nant Whitton Woodlands	11	SSSI	306610	171633	Mixed Woodland

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Receptor Name	Receptor Reference Number (As Included in Dispersion Model)	Designation	Grid Reference		Habitat for Nitrogen and Acid Deposition
Penarth Coast	12	SSSI	317505	167596	Calcareous Grassland and Cliff-top Scrub
Severn Estuary	13	SSSI	319626	172368	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Sully Island	14	SSSI	316540	166918	Rocks include a series of Breccias and Sands ³
Severn Estuary	15	Ramsar Site and Special Protection Area	318851	168061	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Severn Estuary	16	Special Area of Conservation	318893	167958	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Severn Estuary - Sully Island	17	Important Bird Area	316540	166918	Grazing Marsh, Saltmarsh, Shingle, Rocks and Cliffs
Residential Receptor 1	18	Property near junction of Dock View Road and Castleland Street	312387	167970	-
Residential Receptor 2	19	Property near junction of Dock View Road and George Street	312460	168045	-
Residential Receptor 3	20	Property on Dyfrig Street	312073	166912	-
Residential Receptor 4	21	Property of Barry Docks Waterfront Development Phase 1	311975	167617	-
Residential Receptor 5	22	Proposed Property of Barry Docks Waterfront Development Phase 2	312356	167409	-
Residential Receptor 6	23	Property on Bendrick Road	313443	167554	-
Residential Receptor 7	24	Property on Hayes Road	313644	167729	-
Residential Receptor 8	25	Property at Residential area NE of Industrial Area	313380	168850	-

Notes: SSSI = Site of Special Scientific Interest; SAC= Special Area of Conservation; SPA = Special Protection Area.

¹Relevant habitat not listed by Air Pollution Information Service so assumed habitat to comprise of limestone grassland

²Relevant habitat not listed by Air Pollution Information Service so assumed habitat to comprise of calcareous grassland

³Relevant habitat not listed by Air Pollution Information Service so assumed habitat to comprise of shingle, rocks and cliffs

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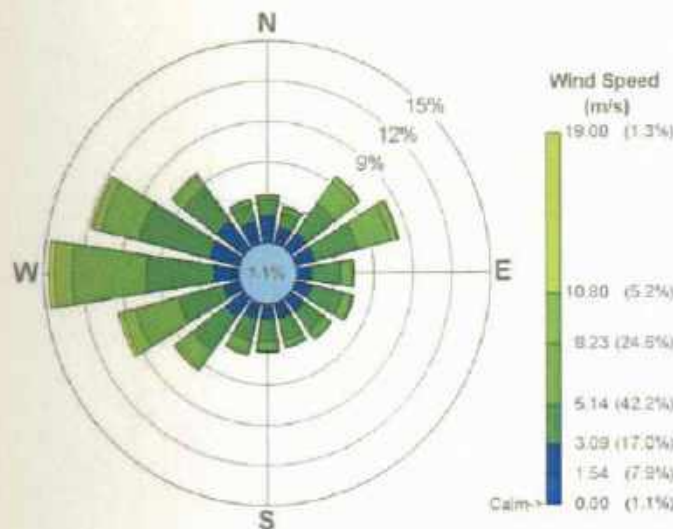
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2.8 Meteorological Data

Five years (2003 to 2007) of hourly sequential meteorological data as measured at the Met Office's Rhoose monitoring station were employed in the dispersion model. The Rhoose monitoring station (station latitude: 51.4 N; station longitude: -3.343 W; station height: 65 m), which is approximately 7 km west of the proposed biomass plant, is the most representative monitoring station for which all meteorological parameters required for AERMOD are available.

Figure 2-1 below shows a windrose produced from data as measured at the Rhoose monitoring station between 2000 and 2007. The predominant wind direction is westerly.

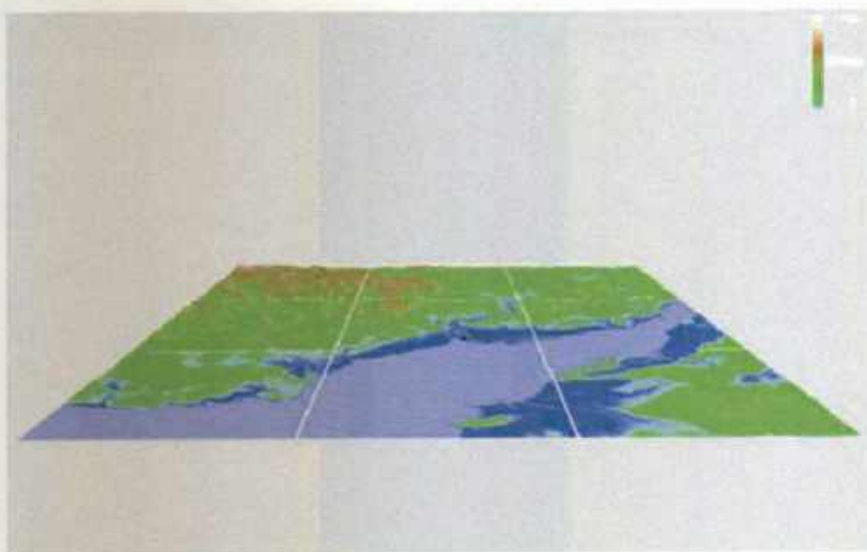
Figure 2-1: Windrose Derived from Rhoose Measurement Data (2000 to 2007)



2.8.1 Terrain

Terrain data have been included in the model to account for topographical features such as hills, which can have a significant effect on the dispersion of pollutants. Elevated position of residential properties on Dock View Road have hence been taken into account.

Figure 2-2: Terrain Included In The Dispersion Model



2.8.2 Surface Characteristics Input to the Dispersion Model

The most influential surface characteristic on pollutant dispersion is the surface roughness length. A value for surface roughness is applied to the model to characterise the effect of the surrounding terrain on the turbulence of near-surface flows. The albedo is the fraction of total incident solar radiation reflected by the surface back to space without absorption. The daytime Bowen ratio, an indicator of surface moisture, is the ratio of the sensible heat flux to the latent heat flux and is used for determining planetary boundary layer parameters for convective conditions. Table 2-11 identifies the surface parameters that were included in the dispersion model. These values assigned to the surface parameters take into account coastal effects on the dispersion of pollutants.

Table 2-11 Surface Characteristics Input to the Dispersion Model

Albedo	Bowen Ratio	Surface Roughness
0.2075	1.5	0.4

2.8.3 Buildings

In order to capture the potential influence of buildings/structures on the dispersion profile of combustion emissions (i.e. building downwash effects), the main building adjacent to the modelled emission source was included in the assessment. The location and height of the modelled building is presented below in Table 2-12.

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Table 2-12 Buildings Details

Building	Grid Reference, X	Grid reference, Y	Height, m	Length, m	Width, m	Angle, degrees
Main Building	312584.7	167673.6	14.1	59.4	45.6	54.2

Notes: Grid reference refers to the southwest corner of building.

2.9 Nitrogen and Acid Deposition

In order to assess the potential impacts of nitrogen and acid deposition at the ecological receptors listed in Table 2-10, nitrogen and acid deposition rates were derived from predicted NO_x and SO₂ concentrations and were compared with prevailing background deposition rates and the upper and lower critical load ranges for key habitats represented at each assessed ecological receptor.

3. ASSESSMENT OF IMPACTS

For deriving long-term (annual average) NO₂ concentrations, 70% of the highest predicted annual average NO_x process contribution was assumed to be converted to NO₂, which in turn was added to the background annual average NO₂ concentration. For short-term (99.8th percentile) NO₂ concentrations, 35% of the highest predicted 99.8th percentile of 1 hour-average NO_x process contributions was added to twice the background annual average NO₂ concentration. For short-term CO, PM₁₀ and SO₂, 100% of the process contribution was added to twice the background annual average concentration. Table 3-1 below presents, for the near-field domain, a sensitivity analysis of the meteorological data employed in the model. The worst-case meteorological years, based on maximum predicted long- and short-term NO_x process contributions, were identified as 2003 and 2004 respectively.

Table 3-1 Sensitivity Analysis, Near-Field Model Domain (2003 to 2007 meteorological data)

Year	Maximum Annual Average NO _x Process Contribution (µg m ⁻³)	Maximum 99.8 th Percentile of 1-hr Average NO _x Process Contribution (µg m ⁻³)
2003	21.7	243.30
2004	16.62	250.40
2005	13.98	210.80
2006	15.41	234.61
2007	14.37	236.44

Table 3-2 below presents, for the near-field and far-field model domains, maximum predicted off-site ground level concentrations (including background) of pollutants of concern. All relevant air quality objectives are predicted to be met across both model domains.

Dispersion profiles of predicted pollutant concentrations are illustrated in the form of contour plots in Appendix 2. The contour plots identify that pollutants generated from the operation of the proposed biomass power plant will disperse rapidly with distance from the site boundary and will reach background concentrations within a few hundred meters.

Table 3-2 AERMOD Predicted Highest Off-Site Ground Level Concentrations (Worst Year Meteorological Data: 2003 for Long-term Impacts and 2004 for Short-term Impacts)

Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration (µg m ⁻³)	Far-field Model Domain Predicted Concentration (µg m ⁻³)	Assessment Criteria/ Benchmark (µg m ⁻³)
NO ₂ Background Concentration	Annual Average	15.20	15.20	40
NO ₂ Process Contribution	Annual Average	15.20	15.20	
NO ₂ Predicted Environmental Concentration	Annual Average	30.40	30.40	
NO ₂ Process Contribution	99.8 th percentile of hourly average concentrations	87.63	45.71	200

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Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Far-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criterial Benchmark ($\mu\text{g m}^{-3}$)
NO ₂ Predicted Environmental Concentration	99.8 th percentile of hourly average concentrations	118.03	76.11	
PM ₁₀ Background Concentration	Annual Average	18.5	18.5	40
PM ₁₀ Process Contribution	Annual Average	1.06	1.06	
PM ₁₀ Predicted Environmental Concentration	Annual Average	19.56	19.56	
PM ₁₀ Process Contribution	90.4 th percentile of 24-hour average concentrations	2.31	2.31	50
PM ₁₀ Predicted Environmental Concentration	90.4 th percentile of 24-hour average concentrations	39.31	39.31	50
CO Background Concentration	Annual Average	113.5	113.5	10000
CO Process Contribution	Max 8-Hour Average	52.27	30.32	
CO Predicted Environmental Concentration	Max 8-Hour Average	279.27	257.32	
SO ₂ Background Concentration	Annual Average	3.6	3.6	-
SO ₂ Process Contribution	99.9 th percentile of 15-min average concentrations	144.77	43.27	266
SO ₂ Predicted Environmental Concentration	99.9 th percentile of 15-min average concentrations	151.97	50.47	
SO ₂ Process Contribution	99.7 th percentile of hourly average concentrations	57.64	31.73	350
SO ₂ Predicted Environmental Concentration	99.7 th percentile of hourly average concentrations	64.84	38.93	350
SO ₂ Process Contribution	99.2 nd percentile of 24-hour average concentrations	21.61	21.61	125
SO ₂ Predicted Environmental Concentration	99.2 nd percentile of 24-hour average concentrations	28.81	28.81	
HCl Background Concentration	Annual Average	Negligible	Negligible	800
HCl Process Contribution	Annual Average	1.06	1.06	
HCl Predicted Environmental Concentration	Annual Average	1.06	1.06	
HCl Process Contribution	1-hour Average	5.48	0.46	20
HCl Predicted Environmental Concentration	1-hour Average	5.48	0.46	
HF Background Concentration	Annual Average	Negligible	Negligible	-

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Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Far-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criteria/Benchmark ($\mu\text{g m}^{-3}$)
HF Process Contribution	1-hour Average	0.55	0.05	250
HF Predicted Environmental Concentration	1-hour Average	0.55	0.05	
Hg Background Concentration	Annual Average	Negligible	Negligible	7.5
Hg Process Contribution	Annual Average	0.01	0.01	7.5
Hg Predicted Environmental Concentration	Annual Average	0.01	0.01	
Hg Process Contribution	1-hour Average	0.03	0.002	0.25
Hg Predicted Environmental Concentration	1-hour Average	0.03	0.002	
Dioxins Background Concentration	Annual Average	Negligible	Negligible	
Dioxins Process Contribution	Annual Average	1.09E ⁻⁸	1.09E ⁻⁸	
Dioxins Predicted Environmental Concentration	Annual Average	1.09E ⁻⁸	1.09E ⁻⁸	
Dioxins Process Contribution	1-hour Average	2.64E ⁻⁷	6.93E ⁻⁸	
Dioxins Predicted Environmental Concentration	1-hour Average	2.64E ⁻⁷	6.93E ⁻⁸	
Dioxins Process Contribution	24-hour Average	5.52E ⁻⁸	4.89E ⁻⁸	
Dioxins Predicted Environmental Concentration	24-hour Average	5.52E ⁻⁸	4.89E ⁻⁸	

Notes: For long-term impacts, predicted concentration = process contribution + background concentration (with an assumed 70% oxidation of NO_x to NO₂); For short-term impacts, predicted concentration = process contribution + 2 × background concentration (with an assumed 35% oxidation of NO_x to NO₂); Maximum predicted 8-hr average CO concentration is not anticipated to vary significantly from the 8-hr rolling average. As there is no 15-min time series can be set in the model, 15-min 99.9th percentile SO₂ process contribution was derived from 99.9th percentile hourly contribution by multiplying 1.34 as conversion factor suggested by IPPC Horizontal Guidance Note 1.

Table 3-3 below identifies maximum predicted off-site ground level pollutant concentrations at each of the discrete residential receptor locations included in the model. Pollutant concentrations are predicted to meet relevant air quality objectives.

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Table 3-3 AERMOD Predicted Maximum Off-Site Ground Level Concentrations at Discrete Residential Receptor Locations (2003 Meteorological Data for Annual Average and 2004 for Short-term Predictions)

Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
NO _x Process Contribution	Annual Average	0.46	0.41	0.18	0.56	1.26	0.47	0.32	0.07
NO _x Background	-	19.91	19.91	19.91	19.91	19.91	19.91	19.91	19.91
NO _x Predicted Environmental Concentration	Annual Average	20.37	20.32	20.09	20.47	21.17	20.38	20.23	19.98
NO ₂ Process Contribution	Annual Average	0.32	0.29	0.13	0.39	0.88	0.33	0.22	0.05
NO ₂ Background	-	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
NO ₂ Predicted Environmental Concentration	Annual Average	15.52	15.49	15.33	15.59	16.08	15.53	15.42	15.25
NO ₂ Process Contribution	99.8 th percentile of hourly average concentrations	6.21	7.50	4.20	4.15	7.75	3.34	2.03	0.92
NO ₂ Background	Twice the annual average concentration	30.40	30.40	30.40	30.40	30.40	30.40	30.40	30.40
NO ₂ Predicted Environmental Concentration	99.8 th percentile of hourly average concentrations	36.61	37.90	34.60	34.55	38.15	33.74	32.43	31.32

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Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
PM ₁₀ Process Contribution	Annual Average	0.02	0.02	0.01	0.03	0.06	0.02	0.02	0.003
PM ₁₀ Background	-	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
PM ₁₀ Predicted Environmental Concentration	Annual Average	18.52	18.52	18.51	18.53	18.56	18.52	18.52	18.50
PM ₁₀ Process Contribution	90.4 th percentile of 24-hour average concentrations	0.07	0.06	0.03	0.05	0.13	0.08	0.05	0.01
PM ₁₀ Background	Twice Annual Average Concentration	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00
PM ₁₀ Predicted Concentration	90.4 th percentile of 24-hour average concentrations	37.07	37.06	37.03	37.05	37.13	37.08	37.05	37.01
CO Process Contribution	Max 8-Hour Average	2.45	2.35	2.76	2.63	3.62	1.31	0.88	0.39
CO Background	Twice the Annual Average Concentration	227.00	227.00	227.00	227.00	227.00	227.00	227.00	227.00
CO Predicted Concentration	Max 8-Hour Average	229.45	229.35	229.76	229.63	230.62	228.31	227.88	227.39

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Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
SO ₂ Process Contribution	Annual Average	0.11	0.10	0.04	0.14	0.31	0.11	0.08	0.02
SO ₂ Background	-	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
SO ₂ Predicted Concentration	Annual Average	3.71	3.70	3.64	3.74	3.91	3.71	3.68	3.62
SO ₂ Process Contribution	99.9 th percentile of 15-min average concentrations	6.91	8.61	5.24	6.82	8.68	4.40	3.42	0.97
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.9 th percentile of 15-min average concentrations	14.11	15.81	12.44	14.02	15.88	11.60	10.62	8.17
SO ₂ Process Contribution	99.7 th percentile of hourly average concentrations	4.19	4.33	1.61	2.72	5.26	1.76	1.06	0.63
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.7 th percentile of hourly average concentrations	11.39	11.53	8.81	9.92	12.46	8.96	8.26	7.83
SO ₂ Process Contribution	99.2 nd percentile of 24-hour average concentrations	0.95	0.81	0.46	0.72	1.82	0.67	0.37	0.17

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Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.2 nd percentile of 24-hour average concentrations	8.15	8.01	7.66	7.92	9.02	7.87	7.57	7.37
HCl Process Contribution	Annual Average	0.02	0.02	0.01	0.03	0.06	0.02	0.02	0.003
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	Annual Average	0.02	0.02	0.01	0.03	0.06	0.02	0.02	0.003
HCl Process Contribution	1-hour Average	1.87	1.96	1.31	1.74	1.87	0.92	0.69	0.25
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	1-hour Average	1.87	1.96	1.31	1.74	1.87	0.92	0.69	0.25
HF Process Contribution	1-hour Average	0.19	0.20	0.13	0.17	0.19	0.09	0.07	0.02
HF Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HF Predicted Concentration	1-hour Average	0.19	0.20	0.13	0.17	0.19	0.09	0.07	0.02
Hg Process Contribution	Annual Average	0.00011	0.00010	0.00004	0.00014	0.00031	0.00011	0.00008	0.00002
Hg Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

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Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
Hg Predicted Concentration	Annual Average	0.00011	0.00010	0.00004	0.00014	0.00031	0.00011	0.00008	0.00002
Hg Process Contribution	1-hour Average	0.01	0.01	0.01	0.009	0.009	0.005	0.003	0.001
Hg Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Hg Predicted Concentration	1-hour Average	0.01	0.01	0.01	0.009	0.009	0.005	0.003	0.001
Dioxins Process Contribution	Annual Average	2.30E-10	2.05E-10	9.06E-11	2.81E-10	6.30E-10	2.34E-10	1.58E-10	3.27E-11
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	Annual Average	2.30E-10	2.05E-10	9.06E-11	2.81E-10	6.30E-10	2.34E-10	1.58E-10	3.27E-11
Dioxins Process Contribution	1-hour Average	1.92E-08	2.01E-08	1.34E-08	1.78E-08	1.92E-08	9.46E-09	7.05E-09	2.53E-09
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	1-hour Average	1.92E-08	2.01E-08	1.34E-08	1.78E-08	1.92E-08	9.46E-09	7.05E-09	2.53E-09
Dioxins Process Contribution	24-hour Average	2.23E-09	2.80E-09	1.96E-09	1.86E-09	3.97E-09	1.49E-09	8.30E-10	3.62E-10
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted	24-hour Average	2.23E-09	2.80E-09	1.96E-09	1.86E-09	3.97E-09	1.49E-09	8.30E-10	3.62E-10

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Pollutant	Averaging Period	Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
		Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)	Predicted Concentration ($\mu\text{g m}^{-3}$)
Concentration									

Notes: Reported annual average NO_x concentration = process contribution + background annual average; For short-term impacts, predicted environmental concentration = process contribution + 2 × background concentration (with an assumed 35% oxidation of NO_x to NO₂); Maximum predicted 8-hr average CO concentration not anticipated to vary significantly from 8-hr rolling average. As no 15-min time series can be set in model, 15-min 99.9th percentile SO₂ process contribution was derived from 99.9th percentile hourly contribution by multiplying 1.34 as conversion factor suggested by IPPC Horizontal Guidance 1.

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3.1.1 Nitrogen Deposition

Nitrogen deposition resulting from the operation of the proposed biomass power plant has been assessed at all ecologically sensitive receptor locations within 10 km of the site. Table 3-4 below identifies that the maximum predicted process contribution to the background nitrogen deposition rate at all of the sites designated for their ecological importance is less than 0.1% of the relevant background deposition rate. Where exceedence of critical nitrogen deposition load was identified, such exceedences are due to predominant background deposition rates and the highest process contribution at such locations is less than 1% of the lower critical load. The process related impacts on the ecologically sensitive sites are hence not considered to be significant.

**Table 3-4 Maximum Predicted Nitrogen Deposition Rate at Ecological Receptors
(maximum across all five years of meteorological data)**

Receptor	Annual Average Environmental NO _x Concentration (Process + Background)	Dry Nitrogen Deposition Rate from the Process	Current Background Nitrogen Deposition Rate	Total Nitrogen Deposition Rate	Critical Load Range of Nitrogen Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Lower Critical Load
	(µg m ⁻³)	(kg N/ha/yr)	kg N/ha/yr	kg N/ha/yr	kg N/ha/yr	%	%
1 Barry Island	19.989	0.008	12.9	12.908	10 to 15	0.06%	0.08%
2 Cliff Wood - Golden Stairs	19.963	0.005	25.3	25.305	10 to 15	0.02%	0.05%
3 Coedydd Y Barri/Barry Woodlands	19.937	0.003	25.3	25.303	10 to 15	0.01%	0.03%
4 Cog Moors	19.943	0.003	11.8	11.803	10 to 15	0.03%	0.03%
5 Cosmeston Park	19.933	0.002	22.5	22.502	10 to 15	0.01%	0.02%
6 Cwm Cydfin, Leckwith	19.917	0.001	26.2	26.201	10 to 15	0.003%	0.01%
7 East Aberthaw Coast	19.924	0.001	13.3	13.301	10 to 15	0.01%	0.01%
8 Ely Valley	19.916	0.001	-	-	-	-	-
9 Flat Holm	19.924	0.001	10.2	10.201	10 to 15	0.01%	0.01%
10 Hayes Point to Bendrick Rock	20.025	0.012	12.9	12.912	10 to 15	0.09%	0.12%
11 Nant Whitton Woodlands	19.919	0.001	31.2	31.201	10 to 15	0.003%	0.01%
12 Penarth Coast	19.942	0.003	11.8	11.803	10 to 15	0.03%	0.03%

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Receptor		Annual Average Environmental NO _x Concentration (Process + Background)	Dry Nitrogen Deposition Rate from the Process	Current Background Nitrogen Deposition Rate	Total Nitrogen Deposition Rate	Critical Load Range of Nitrogen Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Lower Critical Load
		(µg m ⁻³)	(kg N/ha/yr)	kg N/ha/yr	kg N/ha/yr	kg N/ha/yr	%	%
13	Severn Estuary	19.920	0.001	14	14.001	10 to 15	0.01%	0.01%
14	Sully Island	19.954	0.004	11.8	11.804	10 to 15	0.04%	0.04%
15	Severn Estuary	19.931	0.002	11.8	11.802	10 to 15	0.02%	0.02%
16	Severn Estuary	19.931	0.002	11.8	11.802	10 to 15	0.02%	0.02%
17	Severn Estuary - Sully Island	19.954	0.004	11.8	11.804	10 to 15	0.04%	0.04%
Assessment Criteria		30	-	-	-	-	-	1%

Notes: Dry deposition velocity for NO₂ was assumed as 1.5 mm/s and NO₂ wet deposition was assumed as negligible as suggested by the UK Environment Agency for similar assessments. NO₂ wet deposition was assumed as negligible.

3.1.2 Acid Deposition

Acid deposition resulting from the operation of the proposed biomass power plant has been assessed at all ecologically sensitive receptor locations within 10 km of the site. Table 3-5 below identifies that the total process contribution to the acid deposition rate at all sites designated for their ecological importance is less than 1% of the relevant background deposition rate and the critical load identified for relevant habitat. Furthermore, the total acid deposition (process + background) was not predicted to exceed the critical load of the assessed ecological receptors. Hence the impacts of the proposed biomass plant are not considered significant.

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Table 3-5 Maximum Predicted Acid Deposition Rate at Ecological Receptors (maximum across all five years of meteorological data)

Receptor	Annual Average Process NO ₂ Contribution	Annual Average Process SO ₂ Contribution	Dry NO ₂ Acid Deposition from the Process	Dry SO ₂ Acid Deposition from the Process	Wet SO ₂ Acid Deposition from the Process	Total Acid Deposition from the Process	Current Background Acid Deposition	Total Acid Deposition	Critical Load of Acid Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Critical Load
	(µg m ⁻³)	(µg m ⁻³)	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	%	%
1 Barry Island	0.055	0.019	0.00057	0.0038	0.0011	0.0055	1.39	1.396	4	0.40%	0.14%
2 Cliff Wood - Golden Stairs	0.037	0.013	0.00039	0.0026	0.0008	0.0037	2.08	2.084	8.24	0.18%	0.05%
3 Coedydd Y Barri/Barry Woodlands	0.019	0.007	0.00020	0.0013	0.0004	0.0019	2.08	2.082	2.42	0.09%	0.08%
4 Cog Moors	0.023	0.008	0.00024	0.0016	0.0005	0.0023	1.07	1.072	1.5	0.22%	0.15%
5 Cosmeston Park	0.016	0.006	0.00017	0.0011	0.0003	0.0016	1.07	1.072	4	0.15%	0.04%
6 Cwm Cydfin, Leckwith	0.005	0.002	0.00005	0.0003	0.0001	0.0005	2.37	2.370	10.3	0.02%	0.004%
7 East Aberthaw Coast	0.010	0.003	0.00010	0.0007	0.0002	0.0010	-	-	-	-	-
8 Ely Valley	0.004	0.002	0.00005	0.0003	0.0001	0.0004	-	-	-	-	-
9 Flat Holm	0.010	0.003	0.00010	0.0007	0.0002	0.0010	-	-	-	-	-

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Receptor		Annual Average Process NO ₂ Contribution	Annual Average Process SO ₂ Contribution	Dry NO ₂ Acid Deposition from the Process	Dry SO ₂ Acid Deposition from the Process	Wet SO ₂ Acid Deposition from the Process	Total Acid Deposition from the Process	Current Background Acid Deposition	Total Acid Deposition	Critical Load of Acid Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Critical Load
		(µg m ⁻³)	(µg m ⁻³)	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	%	%
10	Hayes Point to Bendrick Rock	0.081	0.028	0.00084	0.0056	0.0017	0.0081	-	-	-	-	-
11	Nant Whitton Woodlands	0.006	0.002	0.00007	0.0004	0.0001	0.0006	2.47	2.471	2.48	0.03%	0.03%
12	Penarth Coast	0.022	0.008	0.00023	0.0016	0.0005	0.0022	-	-	-	-	-
13	Severn Estuary	0.007	0.002	0.00007	0.0005	0.0001	0.0007	-	-	-	-	-
14	Sully Island	0.031	0.011	0.00032	0.0022	0.0006	0.0031	-	-	-	-	-
15	Severn Estuary	0.015	0.005	0.00015	0.0010	0.0003	0.0015	1.07	1.071	1.5	0.14%	0.10%
16	Severn Estuary	0.015	0.005	0.00015	0.0010	0.0003	0.0015	-	-	-	-	-
17	Severn Estuary - Sully Island	0.031	0.011	0.00032	0.0022	0.0006	0.0031	-	-	-	-	-

Note: NO₂ wet deposition was assumed as negligible.

4. CUMULATIVE IMPACT ASSESSMENT

At a distance of around 500 m from the proposed biomass plant, a gasification facility is proposed by Biogen. In-combination impacts on air quality when both the proposed biomass plant and the aforementioned gasification facility are in operation have been predicted using AERMOD dispersion model. Emission parameters pertaining to the proposed Biogen gasification facility have been obtained from the air dispersion modelling report prepared by Parsons Brinckerhoff (Report Reference No: FSE97027C, dated September 2008).

4.1 Emission Parameters Used in the Cumulative Impact Assessment

The physical and emission parameters of the sources included in the cumulative impact assessment are identified in Table 4-1.

Table 4-1 Emission Parameters for Gasification Facility Included in the Dispersion Model

Emission Source	Proposed Gasification Plant (Biogen Plant)	Proposed Biomass Plant (Sunrise Renewables Plant)
Source Location (Easting, Northing)	312775, 167195	312647, 167668
Stack Height, m (from ground level)	45	20
Stack Diameter, m	1.04	0.9
Efflux Temperature, deg K	403	598
Efflux Velocity, m/s	13.03	14
Pollutant Emission Rates, g/s		
NO _x	3.69	0.8132
PM ₁₀	0.1845	0.0407
SO ₂	0.9225	0.2033
CO	0.9225	0.2033
HCl	0.1845	0.0407
HF	0.01845	0.0041
Hg	0.0009225	0.0002
Dioxins and Furans	1.845 x 10 ⁻⁸	4.07 x 10 ⁻¹⁰
Group 1 Metals	0.001025	0.002033
Cadmium & Thallium	0.00046125	0.000203
Total Organic carbon	0.1845	0.04066

4.2 Discrete Receptors

Table 4-2 identifies the sensitive receptors included in the cumulative impact assessment in addition to the sensitive receptors identified in Table 2-10.

Table 4-2 Additional Sensitive Receptors Included in the Cumulative Impact Assessment

Receptor	Grid Reference	
	X-coordinate	Y-coordinate
Hayes Lane	313724	167300
Hayes Point Hospital	314004	167398
Bendrick Road	313410	167478
Hayes Road	313638	167674
Southleigh home	314905	168078

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Receptor	Grid Reference	
	X-coordinate	Y-coordinate
Dock View Road	312397	167944
Dyfrig Street	312109	166908
Children's hospice	314331	167685
Bendrick Rock	313076	167166
Barry Island	312226	166870

4.3 Building Downwash Effects

Table 4-3 identifies the details of the main building included in the cumulative impact assessment (in addition to that identified in Table 2-12) to account for the building downwash effects on the dispersion of emissions from the proposed Biogen gasification facility.

Table 4-3 Buildings Details

Grid Reference, X	Grid reference, Y	Height, m	Length, m	Width, m	Angle, degrees
312755	167215	20	53	79	38

Notes: Grid reference refers to the southwest corner of the building.

4.4 Assessment Results

The cumulative impact assessment outcomes along with additional contour plots are included in Appendix 3.

The highest predicted off-site ground level concentrations (including background concentrations) of pollutants when both the proposed biomass plant and Biogen gasification facility are in simultaneous operation are predicted to meet the air quality objectives. The highest off-site predicted pollutant ground level concentrations are summarised in Table A3-1.

Table A3-2 and Table A3-3 in Appendix 3 identify the highest predicted off-site ground level pollutant concentrations at each discrete receptor locations included in the assessment. Pollutant concentrations are predicted to meet the relevant air quality objectives at all sensitive receptor locations.

Table A3-4 identifies the maximum predicted process contribution from both proposed facilities towards nitrogen deposition at the sites of ecological importance. The process contribution has been predicted to be less than 1% of the background nitrogen deposition rate. Where exceedence of critical nitrogen deposition load was identified, such exceedences are due to predominant background deposition rates and the highest process contribution at such locations is less than 1% of the lower critical load. The process related impacts on the ecologically sensitive sites are hence not considered to be significant.

Table A3-5 identifies that the process contribution to the acid deposition at the sites designated for their ecological importance is less than 3% of background and less than 1% of the critical load

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identified for relevant habitat. Furthermore, the total acid deposition (process contribution + background acid deposition rate) was not predicted to exceed the critical load at the assessed ecological receptors. Hence the cumulative impacts of the proposed biomass plant are not considered significant.

The contour plots identify that pollutants generated from the operation of both the facilities will disperse rapidly with distance from the emission sources and will reach background concentrations within a few hundred meters.

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5. SUMMARY AND CONCLUSIONS

Air quality impacts resulting from operation of the proposed 9 MWe biomass plant have been assessed using an advanced dispersion model 'AERMOD'. All predicted ground level concentrations of NO₂, SO₂, PM₁₀, HCl, HF, Hg, CO and dioxins & furans are predicted to meet relevant air quality objectives designed to protect the human health across the far-field and near-field model domains.

The annual average NO_x concentrations at all the protected/designated ecological sites within 10 km of the proposed development site are predicted to meet the relevant air quality objective for the protection of vegetation and ecosystems. The predicted nitrogen and acid deposition rates are less than 1% of the background deposition rate as well as the lower critical load.

Cumulative air quality impacts resulting from operation of the proposed biomass plant along with the nearby gasification facility have also been assessed using AERMOD. Though the in-combination impacts are marginally higher than that predicted with independent operation of the proposed biomass plant, no exceedence of air quality objectives was predicted.

Air quality impacts resulting from the operation of the proposed biomass plant are not considered to be significant.

APPENDIX 1

Stack Height Assessment of the Biomass Plant Stack

A1.1 Introduction

Air quality impacts resulting from the operation of the biomass plant have been assessed with various hypothetical heights of the emission stack to derive the optimum stack height. The stack height has been varied from 10 m to 35 m (at regular intervals of 5 m) and impacts in terms of ground level nitrogen dioxide (NO₂) concentrations has been predicted using the AERMOD dispersion model.

The predicted long- and short-term impacts are discussed in Section A1.2. The reported concentrations refer to the highest off-site ground level nitrogen dioxide (NO₂) concentrations modelled with the meteorological data for the year 2003 which has been identified as the worst meteorological year for long-term predicted impacts. Emission parameters identified in Table 2-8 of the main report have been included in the stack height assessment.

A1.2 Predicted Air Quality Impacts

Figures A1-1 and A1-2 show the variation of the highest predicted annual average and hourly-average NO₂ ground level concentrations with the height of biomass plant stack. No exceedence of long- and short-term air quality objectives have been predicted at any of the assessed stack heights. Furthermore, the stack height assessment identifies that an increase of stack height beyond 20 m will not result in any significant reduction in short-term (99.79th percentile of hourly averages) NO₂ ground level concentrations. A substantial reduction in predicted long-term average ground level concentrations was identified when the stack height is increased from 15 m to 20 m. Similar reduction in long-term impacts was identified when stack height is further increased to 25 m, but with no significant decrease in short-term impacts. A stack height of 20 m thereby provides a conservative approach to stack height design.

A1.3 Conclusions

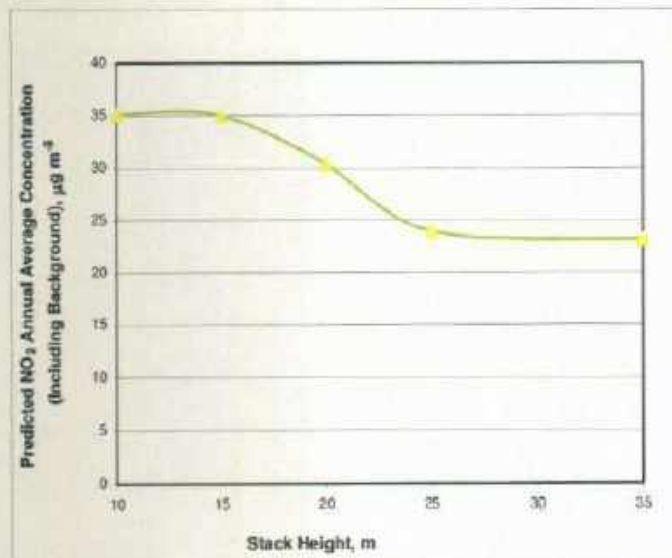
Assessment of stack height for the biomass plant identified that operation of the plant is unlikely to result in significant impacts on local air quality. A stack height of 20 m is identified to balance the costs associated with the increase in stack height against the environmental benefits. Stack height of 20 m is considered to be adequate for the proposed biomass plant.

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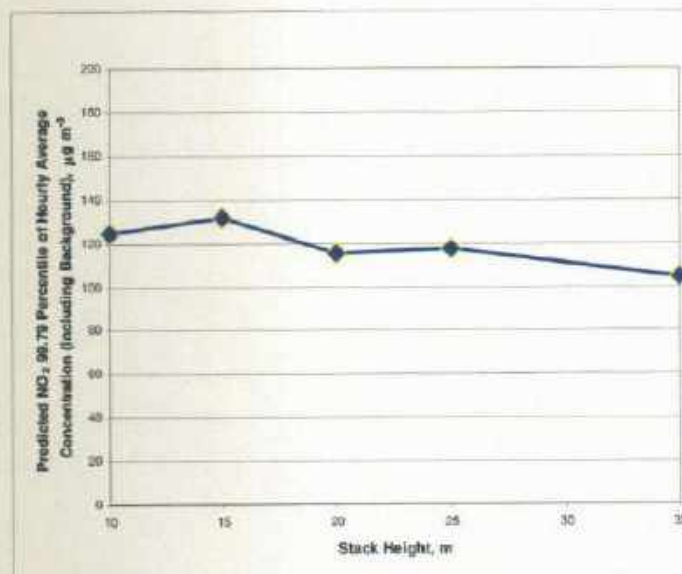


Figure A1-1 Predicted Long-term Impacts In Terms of Ground Level NO₂ Concentrations Including Background Concentrations



Notes: For long-term impacts, predicted environmental concentration = process contribution (with an assumed 70% oxidation of NO_x to NO₂) + background concentration; The assessment criteria refers to the NO₂ concentrations designated in the UK air quality objectives to protect the human health.

Figure A1-2 Predicted Long-term Impacts In Terms of Ground Level NO₂ Concentrations Including Background Concentrations.



For short-term impacts, predicted environmental concentration = process contribution (with an assumed 35% oxidation of NO_x to NO₂) + 2 × background concentration.

APPENDIX 2

Contour Plots Showing Dispersion Profiles of Air Pollutants

Pollutant concentrations are expressed in $\mu\text{g}/\text{m}^3$.

The contour plots are arranged in the following order:

Figure A2-1: Annual Average NO_2 Concentrations (Near-Field Grid Domain with 2003 Meteorological Data including Background)

Figure A2-2: 99.8th Percentile of Hourly Average NO_2 Concentration (Near-Field Grid Domain, 2004 Meteorological data; includes background)

Figure A2-3 : 99.73th Percentile of Hourly Average SO_2 Concentrations (Near- Field Grid Domain, 2004 Meteorological data; includes background)

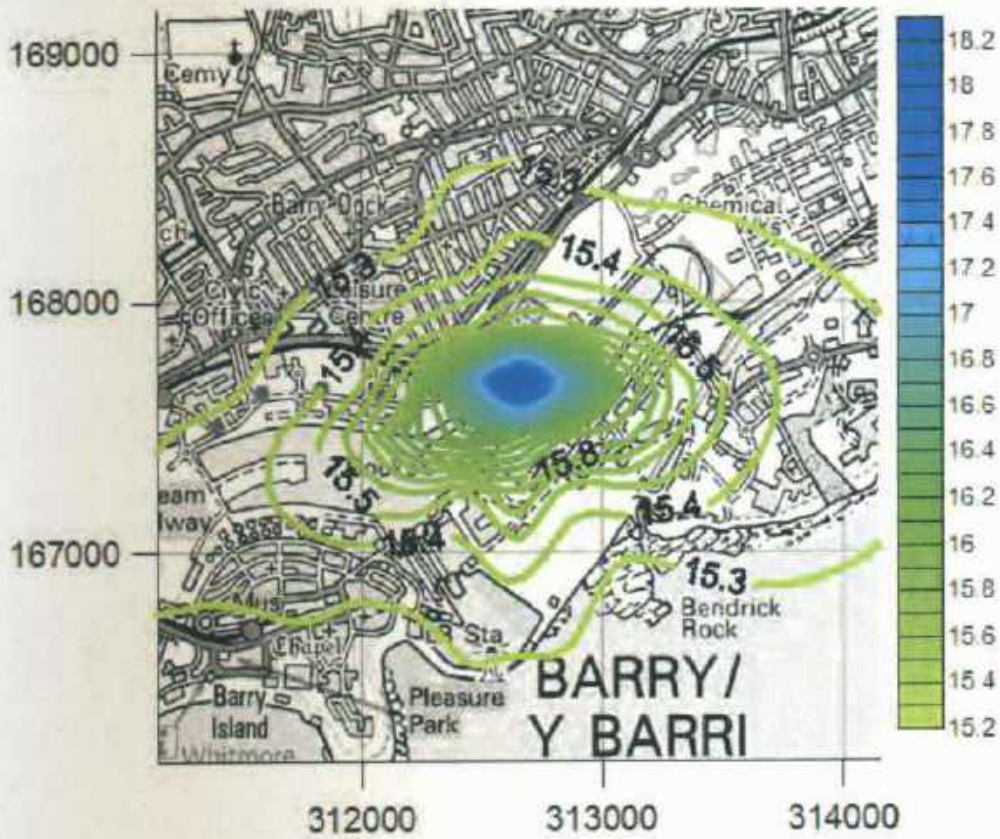
Figure A2-4: 8 Hourly Maximum CO Concentrations (Near-Field Grid Domain, 2004 Meteorological data; includes background)

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Figure A2-1: Annual Average NO₂ Concentrations (Near-Field Grid Domain with 2003 Meteorological Data Including Background)

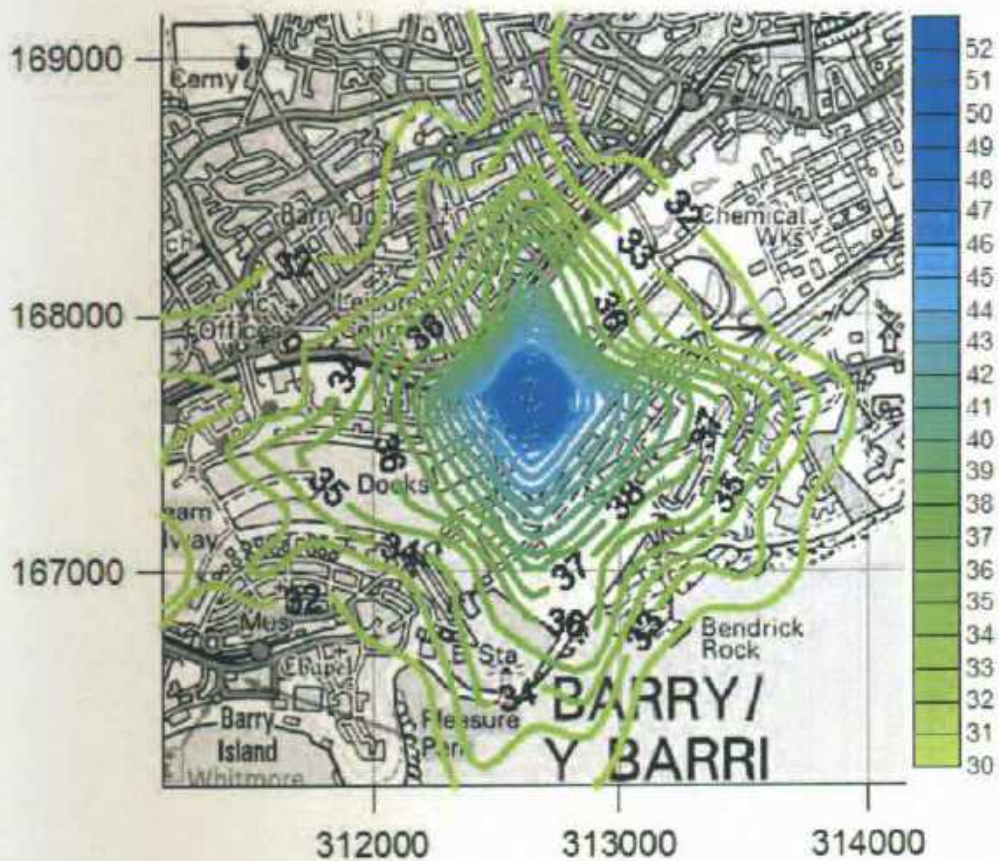


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Figure A2-2: 99.8th Percentile of Hourly Average NO₂ Concentration (Near-Field Grid Domain, 2004 Meteorological data; includes background)

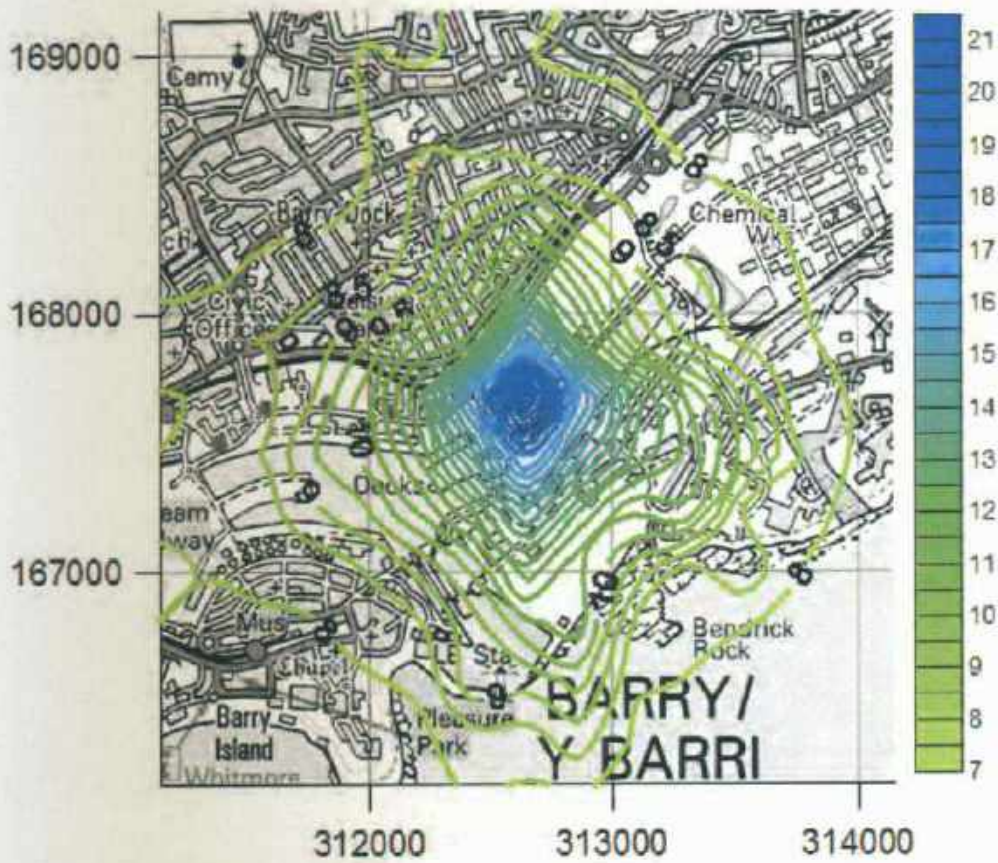


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Figure A2-3: 99.73th Percentile of Hourly Average SO₂ Concentrations (Near- Field Grid Domain, 2004 Meteorological data; includes background)

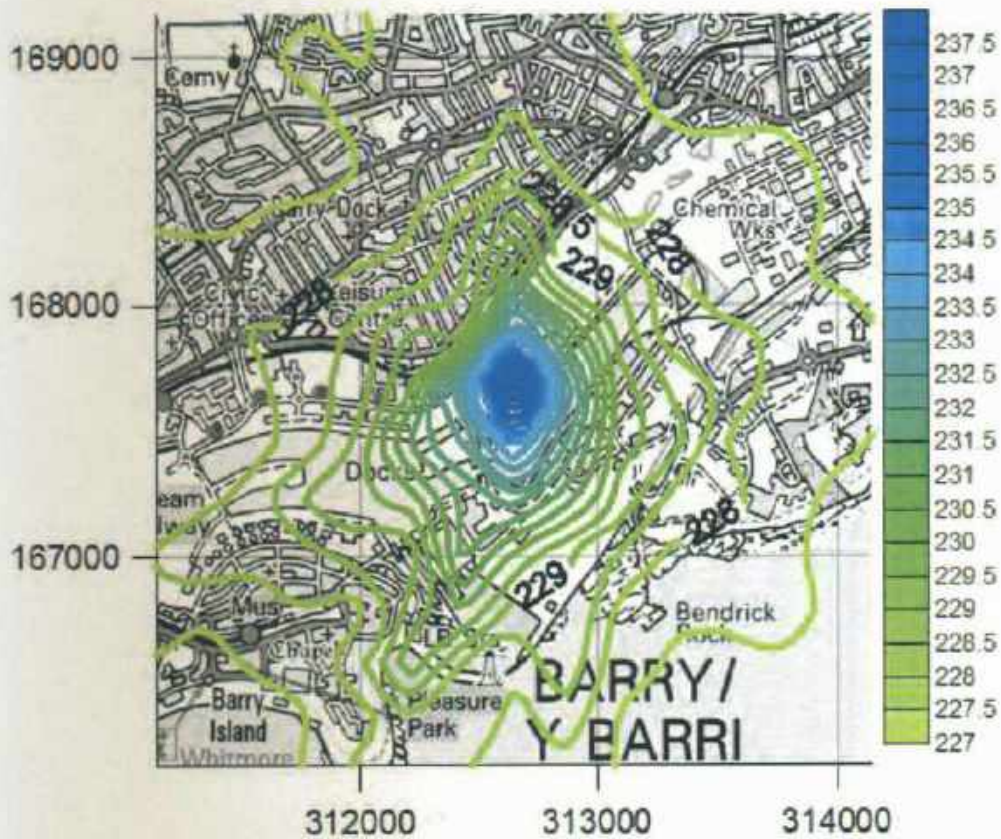


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Figure A2-4: 8 Hourly Maximum CO Concentrations (Near-Field Grid Domain, 2004 Meteorological data; includes background)



APPENDIX 3

Outcomes of the Cumulative Impact Assessment

Outcomes of the in-combination impacts identified in the following tables. Pollutant concentrations are expressed in $\mu\text{g}/\text{m}^3$.

Table A3-1: AERMOD Predicted Highest Off-Site Ground Level Concentrations (Worst-case Year Meteorological Data: 2003 for Long-term Impacts and 2004 for Short-term Impacts).

Table A3-2: AERMOD Predicted Maximum Off-Site Ground Level Concentrations at Discrete Residential Receptor Locations Close to the Proposed Sunrise Renewable Biomass Plant (2003 Meteorological Data for Annual Average and 2004 for Short-term Predictions)

Table A3-3: AERMOD Predicted Maximum Off-Site Ground Level Concentrations at Discrete Sensitive Receptor Locations Close to the Proposed Gasification Facility (2003 Meteorological Data for Annual Average and 2004 for Short-term Predictions)

Table A3-4: Maximum Predicted Nitrogen Deposition Rate at Ecological Receptors (maximum across all five years of meteorological data)

Table A3-5: Maximum Predicted Acid Deposition Rate at Ecological Receptors (maximum across all five years of meteorological data)

Dispersion profiles of emission components are illustrated in the form of contour plots and are presented in the following figures.

Figure A3-1: Annual Average NO_2 Concentrations (Near-Field Grid Domain with 2003 Meteorological Data Including Background)

Figure A3-2: 99.8th Percentile of Hourly Average NO_2 Concentration (Near-Field Grid Domain, 2004 Meteorological data; includes background)

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Table A3-1: In-Combination Impacts - AERMOD Predicted Highest Off-Site Ground Level Concentrations (Worst-case Year Meteorological Data: 2003 for Long-term Impacts and 2004 for Short-term Impacts)

Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criteria/Benchmark ($\mu\text{g m}^{-3}$)
NO ₂ Background Concentration	Annual Average	15.20	40
NO ₂ Process Contribution	Annual Average	15.80	
NO ₂ Predicted Environmental Concentration	Annual Average	31	
NO ₂ Process Contribution	99.8 th percentile of hourly average concentrations	45.66	200
NO ₂ Predicted Environmental Concentration	99.8 th percentile of hourly average concentrations	76.06	
PM ₁₀ Background Concentration	Annual Average	18.5	40
PM ₁₀ Process Contribution	Annual Average	1.10	
PM ₁₀ Predicted Environmental Concentration	Annual Average	19.60	
PM ₁₀ Process Contribution	90.4 th percentile of 24-hour average concentrations	2.34	50
PM ₁₀ Predicted Environmental Concentration	90.4 th percentile of 24-hour average concentrations	39.34	50
CO Background Concentration	Annual Average	113.5	10,000
CO Process Contribution	Max 8-Hour Average	28.69	
CO Predicted Environmental Concentration	Max 8-Hour Average	255.69	
SO ₂ Background Concentration	Annual Average	3.6	-
SO ₂ Process Contribution	99.9 th percentile of 15-min average concentrations	43.45	266
SO ₂ Predicted Environmental Concentration	99.9 th percentile of 15-min average concentrations	50.65	
SO ₂ Process Contribution	99.7 th percentile of hourly average concentrations	31.74	350
SO ₂ Predicted Environmental Concentration	99.7 th percentile of hourly average concentrations	38.94	350
SO ₂ Process Contribution	99.2 nd percentile of 24-hour average concentrations	21.62	125
SO ₂ Predicted Environmental Concentration	99.2 nd percentile of 24-hour average concentrations	28.82	
HCl Background Concentration	Annual Average	Negligible	800
HCl Process Contribution	Annual Average	1.10	
HCl Predicted Environmental Concentration	Annual Average	1.10	
HCl Process Contribution	1-hour Average	6.77	20
HCl Predicted Environmental Concentration	1-hour Average	6.77	
HF Background Concentration	Annual Average	Negligible	-
HF Process Contribution	1-hour Average	0.68	250
HF Predicted Environmental Concentration	1-hour Average	0.68	

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Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criteria/Benchmark ($\mu\text{g m}^{-3}$)
Hg Background Concentration	Annual Average	4.35E-04	7.5
Hg Process Contribution	Annual Average	0.01	7.5
Hg Predicted Environmental Concentration	Annual Average	0.01	
Hg Process Contribution	1-hour Average	0.03	0.25
Hg Predicted Environmental Concentration	1-hour Average	0.03	
Dioxins Background Concentration	Annual Average	Negligible	
Dioxins Process Contribution	Annual Average	9.45E-08	
Dioxins Predicted Environmental Concentration	Annual Average	9.45E-08	
Dioxins Process Contribution	1-hour Average	5.81E-07	
Dioxins Predicted Environmental Concentration	1-hour Average	5.81E-07	
Dioxins Process Contribution	24-hour Average	4.18E-07	
Dioxins Predicted Environmental Concentration	24-hour Average	4.18E-07	
Group 1 Metals Background Concentration	Annual Average	0.04	
Group 1 Metals Process Contribution	Annual Average	0.05	
Group 1 Metals Predicted Environmental Concentration	Annual Average	0.09	
Group 1 Metals Process Contribution	1-hour Average	0.34	
Group 1 Metals Predicted Environmental Concentration	1-hour Average	0.42	
Cadmium & Thallium Background Concentration	Annual Average	3.96E-04	0.005
Cadmium & Thallium Process Contribution	Annual Average	0.01	
Cadmium & Thallium Predicted Environmental Concentration	Annual Average	0.01	
Cadmium & Thallium Process Contribution	1-hour Average	0.03	1.5
Cadmium & Thallium Predicted Environmental Concentration	1-hour Average	0.03	

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Pollutant	Averaging Period	Near-field Model Domain Predicted Concentration ($\mu\text{g m}^{-3}$)	Assessment Criteria/Benchmark ($\mu\text{g m}^{-3}$)
TOC Background Concentration	Annual Average	Negligible	
TOC Process Contribution	Annual Average	1.12	
TOC Predicted Environmental Concentration	Annual Average	1.12	
TOC Process Contribution	1-hour Average	6.88	
TOC Predicted Environmental Concentration	1-hour Average	6.88	

Notes: For long-term impacts, predicted concentration = process contribution + background concentration (with an assumed 70% oxidation of NO_x to NO₂); For short-term impacts, predicted concentration = process contribution + 2 × background concentration (with an assumed 35% oxidation of NO_x to NO₂); Maximum predicted 8-hr average CO concentration is not anticipated to vary significantly from the 8-hr rolling average. As there is no 15-min time series can be set in the model, 15-min 99.9th percentile SO₂ process contribution was derived from 99.9th percentile hourly contribution by multiplying 1.34 as conversion factor suggested by IPPC Horizontal Guidance Note 1. Pollutant concentrations within the boundary of Bogen gasification facility are not excluded and hence the assessment is considered to be conservative in nature.

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Table A3-2: In-Combination Impacts - AERMOD Predicted Maximum Off-Site Ground Level Concentrations at Discrete Residential Receptor Locations Close to the Proposed Sunrise Renewable Biomass Plant (2003 Meteorological Data for Annual Average and 2004 for Short-term Predictions)

Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
NO _x Process Contribution	Annual Average	0.85	0.84	1.92	1.20	2.85	1.43	0.89	0.21
NO _x Background	-	19.91	19.91	19.91	19.91	19.91	19.91	19.91	19.91
NO _x Predicted Environmental Concentration	Annual Average	20.76	20.75	21.83	21.11	22.76	21.34	20.80	20.12
NO ₂ Process Contribution	Annual Average	0.59	0.59	1.34	0.84	1.99	1.00	0.62	0.15
NO ₂ Background	-	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20
NO ₂ Predicted Environmental Concentration	Annual Average	15.79	15.79	16.54	16.04	17.19	16.20	15.82	15.35
NO ₂ Process Contribution	99.8 th percentile of hourly average concentrations	9.41	13.04	8.64	6.55	13.38	6.09	4.37	2.89
NO ₂ Background	Twice the annual average concentration	30.40	30.40	30.40	30.40	30.40	30.40	30.40	30.40
NO ₂ Predicted Environmental Concentration	99.8 th percentile of hourly average concentrations	39.81	43.44	39.04	36.95	43.78	36.49	34.77	33.29

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
PM ₁₀ Process Contribution	Annual Average	0.04	0.04	0.10	0.06	0.14	0.07	0.04	0.011
PM ₁₀ Background	-	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
PM ₁₀ Predicted Environmental Concentration	Annual Average	18.54	18.54	18.60	18.56	18.64	18.57	18.54	18.51
PM ₁₀ Process Contribution	90.4 th percentile of 24-hour average concentrations	0.12	0.12	0.14	0.15	0.37	0.18	0.11	0.03
PM ₁₀ Background	Twice Annual Average Concentration	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00
PM ₁₀ Predicted Concentration	90.4 th percentile of 24-hour average concentrations	37.12	37.12	37.14	37.15	37.37	37.18	37.11	37.03
CO Process Contribution	Max 8-Hour Average	3.47	4.21	4.18	2.91	5.52	3.11	2.01	1.23
CO Background	Twice the Annual Average Concentration	227.00	227.00	227.00	227.00	227.00	227.00	227.00	227.00
CO Predicted Concentration	Max 8-Hour Average	230.47	231.21	231.18	229.91	232.52	230.11	229.01	228.23

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
SO ₂ Process Contribution	Annual Average	0.21	0.21	0.48	0.30	0.70	0.36	0.22	0.05
SO ₂ Background	-	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
SO ₂ Predicted Concentration	Annual Average	3.81	3.81	4.08	3.90	4.30	3.96	3.82	3.65
SO ₂ Process Contribution	99.9 th percentile of 15-min average concentrations	10.45	14.17	11.23	7.13	15.12	6.08	4.30	2.94
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.9 th percentile of 15-min average concentrations	17.65	21.37	18.43	14.33	22.32	13.28	11.50	10.14
SO ₂ Process Contribution	99.7 th percentile of hourly average concentrations	6.45	8.91	5.83	4.40	9.20	4.31	3.09	1.97
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.7 th percentile of hourly average concentrations	13.65	16.11	13.03	11.60	16.40	11.51	10.29	9.17

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
SO ₂ Process Contribution	99.2 nd percentile of 24-hour average concentration	1.74	1.53	1.98	1.73	3.44	1.51	0.94	0.58
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.2 nd percentile of 24-hour average concentrations	8.94	8.73	9.18	8.93	10.64	8.71	8.14	7.78
HCl Process Contribution	Annual Average	0.04	0.04	0.10	0.06	0.14	0.07	0.04	0.011
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	Annual Average	0.04	0.04	0.10	0.06	0.14	0.07	0.04	0.011
HCl Process Contribution	1-hour Average	2.44	3.56	2.78	1.74	2.82	0.99	0.98	0.61
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	1-hour Average	2.44	3.56	2.78	1.74	2.82	0.99	0.98	0.61
HF Process Contribution	1-hour Average	0.24	0.36	0.28	0.17	0.28	0.10	0.10	0.06
HF Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
HF Predicted Concentration	1-hour Average	0.24	0.36	0.28	0.17	0.28	0.10	0.10	0.06
Hg Process Contribution	Annual Average	2.10E-04	2.10E-04	4.80E-04	3.00E-04	7.00E-04	3.60E-04	2.20E-04	5.00E-05
Hg Background	-	4.35E-04	4.35E-04	4.35E-04	4.35E-04	4.35E-04	4.35E-04	4.35E-04	4.35E-04
Hg Predicted Concentration	Annual Average	6.45E-04	6.45E-04	9.15E-04	7.35E-04	1.14E-03	7.95E-04	6.55E-04	4.85E-04
Hg Process Contribution	1-hour Average	0.012	0.018	0.014	0.009	0.014	0.005	0.005	0.003
Hg Background	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Hg Predicted Concentration	1-hour Average	0.013	0.019	0.015	0.010	0.015	0.006	0.006	0.004
Dioxins Process Contribution	Annual Average	3.55E-09	3.53E-09	8.02E-09	5.02E-09	1.19E-08	6.00E-09	3.71E-09	8.87E-10
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	Annual Average	3.55E-09	3.53E-09	8.02E-09	5.02E-09	1.19E-08	6.00E-09	3.71E-09	8.87E-10
Dioxins Process Contribution	1-hour Average	2.05E-07	3.01E-07	2.33E-07	1.49E-07	2.36E-07	8.28E-08	8.21E-08	5.14E-08
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
Dioxins Predicted Concentration	1-hour Average	2.05E-07	3.01E-07	2.33E-07	1.49E-07	2.36E-07	8.28E-08	8.21E-08	5.14E-08
Dioxins Process Contribution	24-hour Average	3.07E-08	4.90E-08	5.08E-08	3.89E-08	7.52E-08	3.55E-08	2.71E-08	1.33E-08
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	24-hour Average	3.07E-08	4.90E-08	5.08E-08	3.89E-08	7.52E-08	3.55E-08	2.71E-08	1.33E-08
Group 1 Metals Process Contribution	Annual Average	0.0013	0.0011	0.0009	0.0016	0.0036	0.0014	0.0009	0.0002
Group 1 Metals Background	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Group 1 Metals Predicted Concentration	Annual Average	0.041	0.041	0.041	0.042	0.044	0.041	0.041	0.040
Group 1 Metals Process Contribution	1-hour Average	0.10	0.10	0.07	0.09	0.10	0.05	0.03	0.01
Group 1 Metals Background	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Group 1 Metals Predicted Concentration	1-hour Average	0.17	0.17	0.14	0.16	0.17	0.12	0.10	0.08

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
Cadmium & Thallium Process Contribution	Annual Average	1.60E-04	1.60E-04	2.60E-04	2.20E-04	5.10E-04	2.40E-04	1.50E-04	3.00E-05
Cadmium & Thallium Background	-	3.96E-04	3.96E-04	3.96E-04	3.96E-04	3.96E-04	3.96E-04	3.96E-04	3.96E-04
Cadmium & Thallium Predicted Concentration	Annual Average	5.56E-04	5.56E-04	6.56E-04	6.16E-04	9.06E-04	6.36E-04	5.46E-04	4.26E-04
Cadmium & Thallium Process Contribution	1-hour Average	0.0095	0.0127	0.0069	0.0088	0.0095	0.0047	0.0035	0.0017
Cadmium & Thallium Background	-	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Cadmium & Thallium Predicted Concentration	1-hour Average	0.0103	0.0135	0.0077	0.0096	0.0103	0.0055	0.0043	0.0025

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g m}^{-3}$)							
		Residential Receptor 1	Residential Receptor 2	Residential Receptor 3	Residential Receptor 4	Residential Receptor 5	Residential Receptor 6	Residential Receptor 7	Residential Receptor 8
TOC Process Contribution	Annual Average	0.04	0.04	0.10	0.06	0.14	0.07	0.04	0.01
TOC Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
TOC Predicted Concentration	Annual Average	0.04	0.04	0.10	0.06	0.14	0.07	0.04	0.01
TOC Process Contribution	1-hour Average	2.44	3.58	2.78	1.77	2.82	0.99	0.98	0.61
TOC Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
TOC Predicted Concentration	1-hour Average	2.44	3.58	2.78	1.77	2.82	0.99	0.98	0.61

Notes: Reported annual average NO_x concentration = process contribution + background annual average; For short-term impacts, predicted environmental concentration = process contribution + 2 × background concentration (with an assumed 35% oxidation of NO_x to NO₂); Maximum predicted 8-hr average CO concentration not anticipated to vary significantly from 8-hr rolling average. As no 15-min time series can be set in model, 15-min 99.9th percentile SO₂ process contribution was derived from 99.9th percentile hourly contribution by multiplying 1.34 as conversion factor suggested by IPPC Horizontal Guidance 1.

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Table A3-3 In-Combination Impacts - AERMOD Predicted Maximum Off-Site Ground Level Concentrations at Discrete Sensitive Receptor Locations Close to the Proposed Gasification Facility (2003 Meteorological Data for Annual Average and 2004 for Short-term Predictions)

Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g}/\text{m}^3$)									
		Hayes Lane	Hayes Point Hospital	Bendrick Road	Hayes Road	Southleigh Home	Dock View Road	Dyfrig Street	Children's Hosplice	Bendrick Rock	Barry Island
NO _x Process Contribution	Annual Average	1.44	0.92	1.70	0.97	0.31	0.93	2.02	0.55	4.35	2.11
NO _x Background	-	19.91	19.91	19.91	19.91	19.91	19.91	19.91	19.91	19.91	19.91
NO _x Predicted Environmental Concentration	Annual Average	21.35	20.83	21.61	20.88	20.22	20.84	21.93	20.46	24.26	22.02
NO ₂ Process Contribution	Annual Average	1.01	0.64	1.19	0.68	0.22	0.65	1.41	0.39	3.05	1.47
NO ₂ Background	-	15.20	15.20	15.20	15.20	15.20	15.20	15.20	15.20	16.20	17.20
NO ₂ Predicted Environmental Concentration	Annual Average	16.21	15.84	16.39	15.88	15.42	15.85	16.61	15.59	19.25	18.67
NO ₂ Process Contribution	99.8 th percentile of hourly average concentrations	6.59	3.78	7.35	4.50	2.23	9.44	8.95	2.79	14.72	10.69
NO ₂ Background	Twice the annual average concentration	30.40	30.40	30.40	30.40	30.40	30.40	30.40	30.40	30.40	30.40
NO ₂ Predicted Environmental Concentration	99.8 th percentile of hourly average concentrations	36.99	34.18	37.75	34.90	32.63	39.84	39.35	33.19	45.12	41.09
PM ₁₀ Process Contribution	Annual Average	0.07	0.05	0.08	0.05	0.02	0.05	0.10	0.03	0.22	0.11
PM ₁₀ Background	-	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	19.50	20.50

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g}/\text{m}^3$)									
		Hayes Lane	Hayes Point Hospital	Bendrick Road	Hayes Road	Southleigh Home	Dock View Road	Dyfrig Street	Children's Hosplice	Bendrick Rock	Barry Island
PM ₁₀ Predicted Environmental Concentration	Annual Average	18.57	18.55	18.58	18.55	18.52	18.55	18.60	18.53	19.72	20.61
PM ₁₀ Process Contribution	90.4 th percentile of 24-hour average concentrations	0.21	0.13	0.21	0.13	0.04	0.13	0.14	0.08	0.69	0.20
PM ₁₀ Background	Twice Annual Average Concentration	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	39.00	41.00
PM ₁₀ Predicted Concentration	90.4 th percentile of 24-hour average concentrations	37.21	37.13	37.21	37.13	37.04	37.13	37.14	37.08	39.69	41.20
CO Process Contribution	Max 8-Hour Average	2.94	2.04	3.61	2.19	0.87	3.53	4.27	1.22	7.19	8.48
CO Background	Twice the Annual Average Concentration	227.00	227.00	227.00	227.00	227.00	227.00	227.00	227.00	227.00	227.00
CO Predicted Concentration	Max 8-Hour Average	229.94	229.04	230.61	229.19	227.87	230.53	231.27	228.22	234.19	235.48
SO ₂ Process Contribution	Annual Average	0.36	0.23	0.42	0.24	0.08	0.23	0.50	0.14	1.09	0.53
SO ₂ Background		3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	4.60	5.60
SO ₂ Predicted Concentration	Annual Average	3.96	3.83	4.02	3.84	3.68	3.83	4.10	3.74	5.69	6.13
SO ₂ Process Contribution	99.9 th percentile of 15-min average concentrations	7.27	4.04	7.69	4.45	2.33	9.91	11.57	3.36	14.40	12.54
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	9.20	11.20

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Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g}/\text{m}^3$)									
		Hayes Lane	Hayes Point Hospital	Bendrick Road	Hayes Road	Southleigh Home	Dock View Road	Dyfrig Street	Children's Hospice	Bendrick Rock	Barry Island
SO ₂ Predicted Concentration	99.9 th percentile of 15-min average concentrations	14.47	11.24	14.89	11.65	9.53	17.11	18.77	10.56	23.60	23.74
SO ₂ Process Contribution	99.7 th percentile of hourly average concentrations	4.50	2.65	5.11	3.15	1.53	6.55	5.77	1.97	10.42	7.11
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
SO ₂ Predicted Concentration	99.7 th percentile of hourly average concentrations	11.70	9.85	12.31	10.35	8.73	13.75	12.97	9.17	17.62	14.31
SO ₂ Process Contribution	99.2 nd percentile of 24-hour average concentrations	1.57	1.00	1.70	1.03	0.39	1.76	2.35	0.74	5.49	2.24
SO ₂ Background	Twice the annual average concentration	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	8.20	9.20
SO ₂ Predicted Concentration	99.2 nd percentile of 24-hour average concentrations	8.77	8.20	8.90	8.23	7.59	8.96	9.55	7.94	13.69	11.44
HCl Process Contribution	Annual Average	0.07	0.05	0.08	0.05	0.02	0.05	0.10	0.03	0.22	0.11
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	Annual Average	0.07	0.05	0.08	0.05	0.02	0.05	0.10	0.03	0.22	0.11
HCl Process Contribution	1-hour Average	1.75	1.58	1.53	0.77	0.37	2.47	2.85	0.92	2.25	2.33
HCl Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HCl Predicted Concentration	1-hour Average	1.75	1.58	1.53	0.77	0.37	2.47	2.85	0.92	2.25	2.33

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Pollutant	Averaging Period	Predicted Concentration (µg/m ³)									
		Hayes Lane	Hayes Point Hospital	Bendrick Road	Hayes Road	Southleigh Home	Dock View Road	Dyfrig Street	Children's Hospice	Bendrick Rock	Barry Island
HF Process Contribution	1-hour Average	0.17	0.16	0.15	0.08	0.04	0.25	0.28	0.09	0.23	0.23
HF Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
HF Predicted Concentration	1-hour Average	0.17	0.16	0.15	0.08	0.04	0.25	0.28	0.09	0.23	0.23
Hg Process Contribution	Annual Average	0.0004	0.0002	0.0004	0.0002	0.0001	0.0002	0.0005	0.0001	0.0011	0.0005
Hg Background	-	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Hg Predicted Concentration	Annual Average	0.0008	0.0006	0.0008	0.0006	0.0005	0.0006	0.0009	0.0005	0.0015	0.0009
Hg Process Contribution	1-hour Average	0.0088	0.0079	0.0076	0.0039	0.0019	0.0123	0.0142	0.0046	0.0113	0.0117
Hg Background	-	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
Hg Predicted Concentration	1-hour Average	0.0097	0.0088	0.0085	0.0048	0.0028	0.0132	0.0151	0.0055	0.0122	0.0126
Dioxins Process Contribution	Annual Average	6.02E-09	3.84E-09	7.12E-09	4.06E-09	1.29E-09	3.89E-09	8.44E-09	2.32E-09	1.82E-08	8.82E-09
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	Annual Average	6.02E-09	3.84E-09	7.12E-09	4.06E-09	1.29E-09	3.89E-09	8.44E-09	2.32E-09	1.82E-08	8.82E-09
Dioxins Process Contribution	1-hour Average	1.47E-07	1.33E-07	1.28E-07	6.48E-08	3.1E-08	2.07E-07	2.39E-07	7.72E-08	1.89E-07	1.95E-07
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	1-hour Average	1.47E-07	1.33E-07	1.28E-07	6.48E-08	3.10E-08	2.07E-07	2.39E-07	7.72E-08	1.89E-07	1.95E-07
Dioxins Process Contribution	24-hour Average	3.15E-08	2.26E-08	4.17E-08	2.69E-08	1.14E-08	3.51E-08	4.99E-08	1.53E-08	1.06E-07	6.55E-08

PROPOSED BIOMASS POWER PLANT, BARRY
AIR QUALITY ASSESSMENT

SUNRISE RENEWABLES



Pollutant	Averaging Period	Predicted Concentration (µg/m³)									
		Hayes Lane	Hayes Point Hospital	Bendrick Road	Hayes Road	Southleigh Home	Dock View Road	Dyfrig Street	Children's Hosplice	Bendrick Rock	Barry Island
Dioxins Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Dioxins Predicted Concentration	24-hour Average	3.15E-08	2.26E-08	4.17E-08	2.69E-08	1.14E-08	3.51E-08	4.99E-08	1.53E-08	1.06E-07	6.55E-08
Group 1 Metals Process Contribution	Annual Average	0.0009	0.0007	0.0015	0.0010	0.0003	0.0014	0.0009	0.0005	0.0017	0.0010
Group 1 Metals Background	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Group 1 Metals Predicted Concentration	Annual Average	0.041	0.041	0.042	0.04	0.04	0.041	0.041	0.041	0.042	0.041
Group 1 Metals Process Contribution	1-hour Average	0.03	0.02	0.05	0.04	0.01	0.11	0.07	0.01	0.05	0.08
Group 1 Metals Background	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Group 1 Metals Predicted Concentration	1-hour Average	0.10	0.09	0.12	0.11	0.08	0.18	0.14	0.08	0.12	0.15
Cadmium & Thallium Process Contribution	Annual Average	0.0002	0.0001	0.0003	0.0002	0.0001	0.0002	0.0003	0.0001	0.0006	0.0003
Cadmium & Thallium Background	-	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Cadmium & Thallium Predicted Concentration	Annual Average	0.0006	0.0005	0.0007	0.0006	0.0005	0.0006	0.0007	0.0005	0.0010	0.0007

**PROPOSED BIOMASS POWER PLANT, BARRY
AIR QUALITY ASSESSMENT**

SUNRISE RENEWABLES



Pollutant	Averaging Period	Predicted Concentration (µg/m ³)									
		Hayes Lane	Hayes Point Hospital	Bendrick Road	Hayes Road	Southleigh Home	Dock View Road	Dyfrig Street	Children's Hospice	Bendrick Rock	Barry Island
Cadmium & Thallium Process Contribution	1-hour Average	0.0044	0.0040	0.0049	0.0037	0.0010	0.0112	0.0073	0.0023	0.0056	0.0078
Cadmium & Thallium Background	-	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Cadmium & Thallium Predicted Concentration	1-hour Average	0.0052	0.0048	0.0057	0.0045	0.0018	0.0120	0.0081	0.0031	0.0064	0.0086
TOC Process Contribution	Annual Average	0.07	0.05	0.08	0.05	0.02	0.05	0.10	0.03	0.22	0.11
TOC Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
TOC Predicted Concentration	Annual Average	0.07	0.05	0.08	0.05	0.02	0.05	0.10	0.03	0.22	0.11
TOC Process Contribution	1-hour Average	1.75	1.58	1.53	0.77	0.37	2.47	2.85	0.92	2.25	2.33
TOC Background	-	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
TOC Predicted Concentration	1-hour Average	1.75	1.58	1.53	0.77	0.37	2.47	2.85	0.92	2.25	2.33

Notes: Reported annual average NO_x concentration = process contribution + background annual average; For short-term impacts, predicted environmental concentration = process contribution + 2 × background concentration (with an assumed 35% oxidation of NO_x to NO₂); Maximum predicted 8-hr average CO concentration not anticipated to vary significantly from 8-hr rolling average. As no 15-min time series can be set in model, 15-min 99.9th percentile SO₂ process contribution was derived from 99.9th percentile hourly contribution by multiplying 1.34 as conversion factor suggested by IPPC Horizontal Guidance 1.

PROPOSED BIOMASS POWER PLANT, BARRY
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SUNRISE RENEWABLES



Table A3-4 In-Combination Impacts - Maximum Predicted Nitrogen Deposition Rate at Ecological Receptors (maximum across all five years of meteorological data)

Receptor	Annual Average Environmental NO _x Concentration (Process + Background) ($\mu\text{g m}^{-3}$)	Dry Nitrogen Deposition Rate from the Process (kg N/ha/yr)	Current Background Nitrogen Deposition Rate kg N/ha/yr	Total Nitrogen Deposition Rate kg N/ha/yr	Critical Load Range of Nitrogen Deposition kg N/ha/yr	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Lower Critical Load	
						%	%	
1	Barry Island	0.54	0.054	12.9	12.95	10 to 15	0.42%	0.54%
2	Cliff Wood - Golden Stairs	0.18	0.018	25.3	25.32	10 to 15	0.07%	0.18%
3	Coedydd Y Barri/Barry Woodlands	0.12	0.012	25.3	25.31	10 to 15	0.05%	0.12%
4	Cog Moors	0.15	0.015	11.8	11.82	10 to 15	0.12%	0.15%
5	Cosmeston Park	0.11	0.011	22.5	22.51	10 to 15	0.05%	0.11%
6	Cwm Cydfin, Leckwith	0.03	0.003	26.2	26.20	10 to 15	0.01%	0.03%
7	East Aberthaw Coast	0.07	0.007	13.3	13.31	10 to 15	0.05%	0.07%
8	Ely Valley	0.03	0.003	-	-	-	-	-
9	Flat Holm	0.07	0.007	10.2	10.21	10 to 15	0.07%	0.07%
10	Hayes Point to Bendrick Rock	1.11	0.112	12.9	13.01	10 to 15	0.87%	1.12%
11	Nant Whitton Woodlands	0.04	0.004	31.2	31.20	10 to 15	0.01%	0.04%
12	Penarth Coast	0.15	0.015	11.8	11.82	10 to 15	0.13%	0.15%

PROPOSED BIOMASS POWER PLANT, BARRY
AIR QUALITY ASSESSMENT

SUNRISE RENEWABLES



Receptor		Annual Average Environmental NO _x Concentration (Process + Background)	Dry Nitrogen Deposition Rate from the Process	Current Background Nitrogen Deposition Rate	Total Nitrogen Deposition Rate	Critical Load Range of Nitrogen Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Lower Critical Load
		($\mu\text{g m}^{-3}$)	(kg N/ha/yr)	kg N/ha/yr	kg N/ha/yr	kg N/ha/yr	%	%
13	Severn Estuary	0.04	0.004	14	14.00	10 to 15	0.03%	0.04%
14	Sully Island	0.23	0.024	11.8	11.82	10 to 15	0.20%	0.24%
15	Severn Estuary	0.10	0.010	11.8	11.81	10 to 15	0.08%	0.10%
16	Severn Estuary	0.10	0.010	11.8	11.81	10 to 15	0.08%	0.10%
17	Severn Estuary - Sully Island	0.23	0.024	11.8	11.82	10 to 15	0.20%	0.24%
Assessment Criteria		30	-	-	-	-	-	1%

Notes: Dry deposition velocity for NO₂ was assumed as 1.5 mm/s and NO₂ wet deposition was assumed as negligible as suggested by the UK Environment Agency for similar assessments. NO₂ wet deposition was assumed as negligible.

PROPOSED BIOMASS POWER PLANT, BARRY
AIR QUALITY ASSESSMENT

SUNRISE RENEWABLES



Table A3-5 In-Combination Impacts - Maximum Predicted Acid Deposition Rate at Ecological Receptors (maximum across all five years of meteorological data)

Receptor		Annual Average Process NO ₂ Contribution	Annual Average Process SO ₂ Contribution	Dry NO ₂ Acid Deposition from the Process	Dry SO ₂ Acid Deposition from the Process	Wet SO ₂ Acid Deposition from the Process	Total Acid Deposition from the Process	Current Background Acid Deposition	Total Acid Deposition	Critical Load of Acid Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Critical Load
		(µg m ⁻³)	(µg m ⁻³)	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	%	%
1	Barry Island	0.38	0.13	0.0039	0.0269	0.0079	0.039	1.39	1.43	4	2.79%	0.97%
2	Cliff Wood - Golden Stairs	0.13	0.04	0.0013	0.0090	0.0026	0.013	2.08	2.09	8.24	0.62%	0.16%
3	Coedydd Y Barri/Barry Woodlands	0.08	0.03	0.0008	0.0058	0.0017	0.008	2.08	2.09	2.42	0.40%	0.34%
4	Cog Moors	0.10	0.04	0.0011	0.0073	0.0021	0.010	1.07	1.08	1.5	0.98%	0.70%
5	Cosmeston Park	0.08	0.03	0.0008	0.0055	0.0016	0.008	1.07	1.08	4	0.74%	0.20%
6	Cwm Cydfin, Leckwith	0.02	0.01	0.0002	0.0014	0.0004	0.002	2.37	2.37	10.3	0.09%	0.02%

PROPOSED BIOMASS POWER PLANT, BARRY
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SUNRISE RENEWABLES



Receptor	Annual Average Process NO ₂ Contribution	Annual Average Process SO ₂ Contribution	Dry NO ₂ Acid Deposition from the Process	Dry SO ₂ Acid Deposition from the Process	Wet SO ₂ Acid Deposition from the Process	Total Acid Deposition from the Process	Current Background Acid Deposition	Total Acid Deposition	Critical Load of Acid Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Critical Load
	(µg m ⁻³)	(µg m ⁻³)	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	%	%
7 East Aberthaw Coast	0.05	0.02	0.0005	0.0032	0.0010	0.005	NA	-	NA	-	-
8 Ely Valley	0.02	0.01	0.0002	0.0013	0.0004	0.002	-	-	-	-	-
9 Flat Holm	0.05	0.02	0.0005	0.0033	0.0010	0.005	NA	-	NA	-	-
10 Hayes Point to Bendrick Rock	0.78	0.28	0.0081	0.0553	0.0162	0.080	NA	-	NA	-	-
11 Nant Whitton Woodlands	0.03	0.01	0.0003	0.0021	0.0006	0.003	2.47	2.47	2.48	0.12%	0.12%
12 Penarth Coast	0.11	0.04	0.0011	0.0075	0.0022	0.011	NA	-	NA	-	-
13 Severn Estuary	0.03	0.01	0.0003	0.0022	0.0006	0.003	NA	-	NA	-	-

PROPOSED BIOMASS POWER PLANT, BARRY
AIR QUALITY ASSESSMENT

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Receptor		Annual Average Process NO ₂ Contribution	Annual Average Process SO ₂ Contribution	Dry NO ₂ Acid Deposition from the Process	Dry SO ₂ Acid Deposition from the Process	Wet SO ₂ Acid Deposition from the Process	Total Acid Deposition from the Process	Current Background Acid Deposition	Total Acid Deposition	Critical Load of Acid Deposition	Process Contribution as a Percentage of Background Deposition	Process Contribution as a Percentage of Critical Load
		(µg m ⁻³)	(µg m ⁻³)	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	keq/ha-yr	%	%
14	Sully Island	0.16	0.06	0.0017	0.0116	0.0034	0.017	NA	-	NA	-	-
15	Severn Estuary	0.07	0.02	0.0007	0.0048	0.0014	0.007	1.07	1.08	1.5	0.64%	0.46%
16	Severn Estuary	0.07	0.02	0.0007	0.0049	0.0014	0.007	NA	-	NA	-	-
17	Severn Estuary - Sully Island	0.16	0.06	0.0017	0.0116	0.0034	0.017	NA	-	NA	-	-

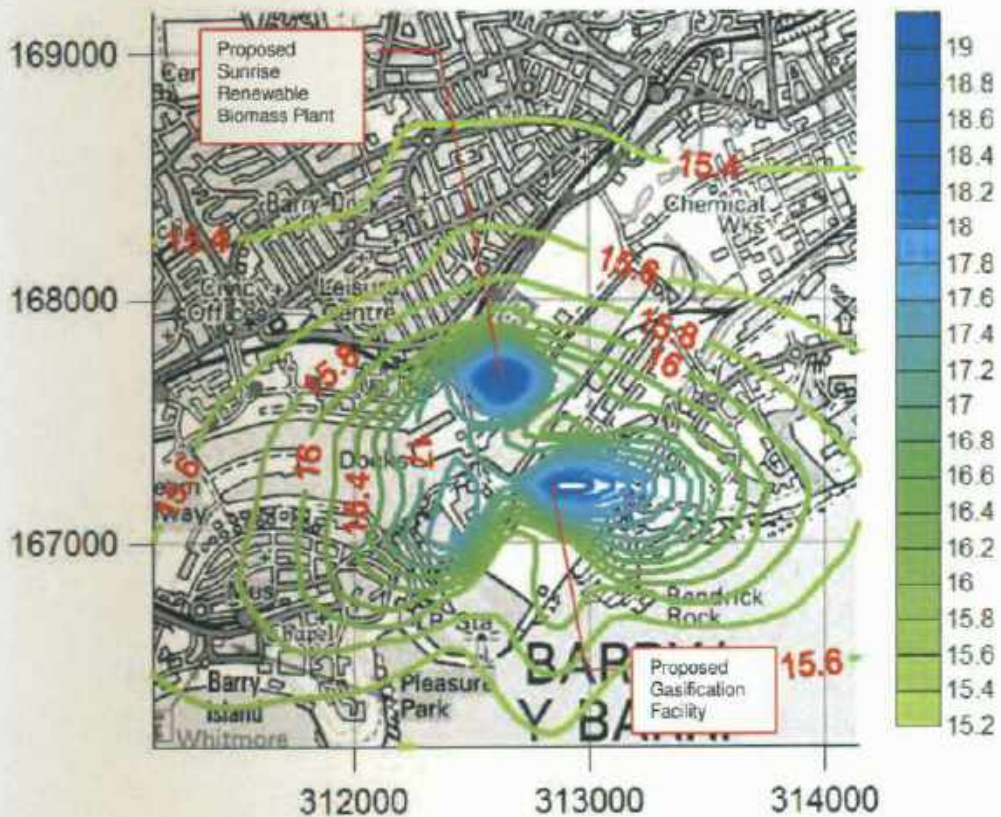
Note: NO₂ wet deposition was assumed as negligible.

PROPOSED BIOMASS POWER PLANT, BARRY
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SUNRISE RENEWABLES



Figure A3-1: In-Combination Impacts - Annual Average NO₂ Concentrations (Near-Field Grid Domain with 2003 Meteorological Data Including Background)

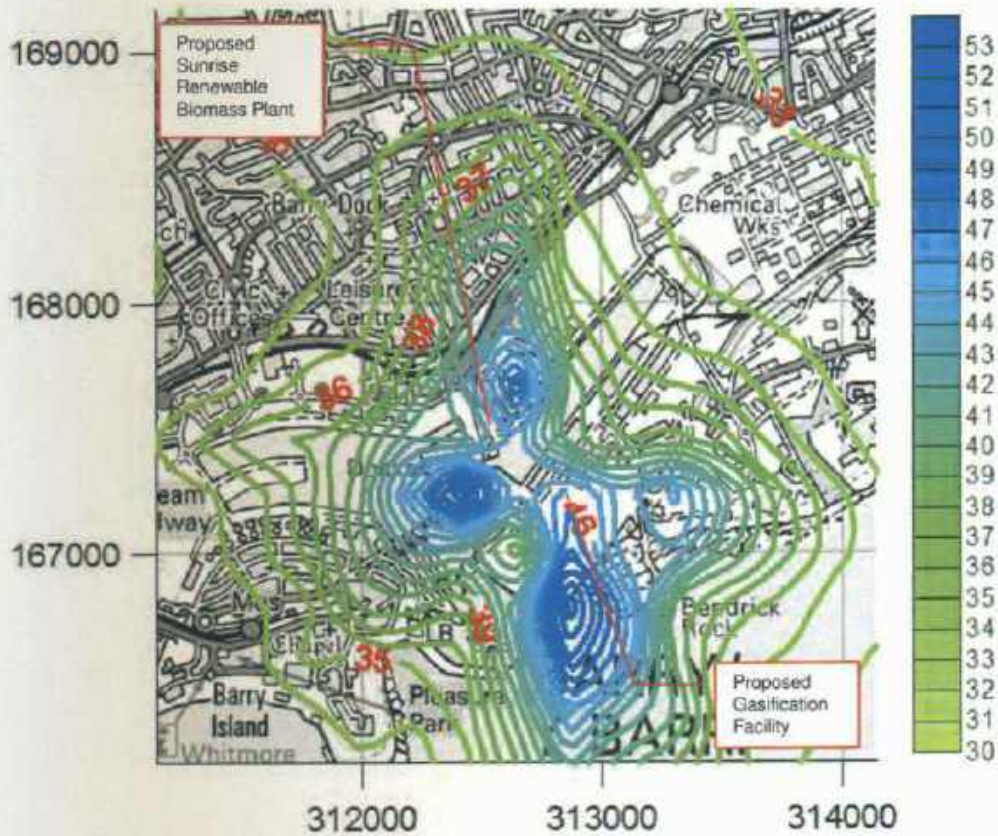


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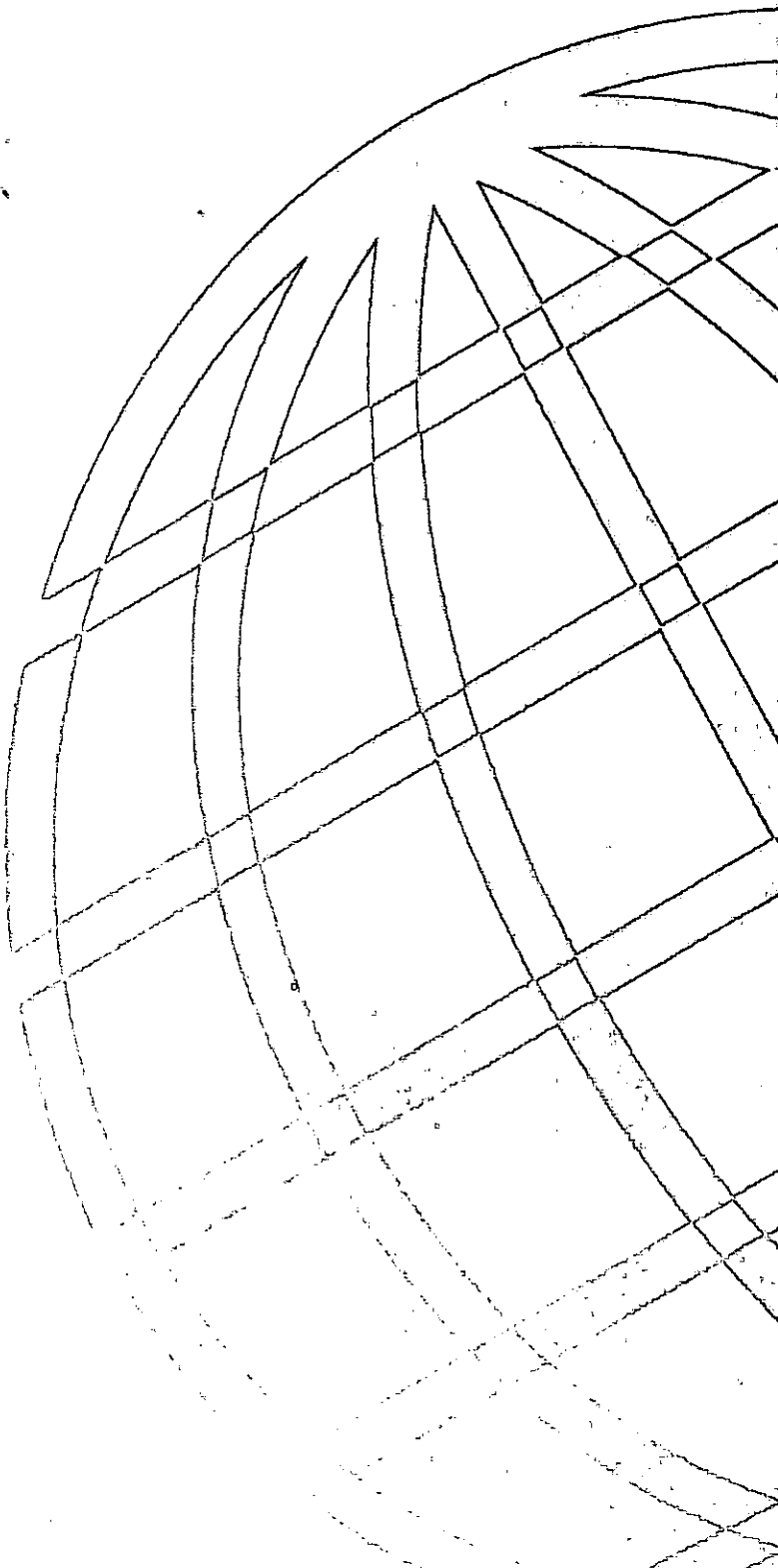
SUNRISE RENEWABLES

Figure A3-2: In-Combination Impacts - 99.8th Percentile of Hourly Average NO₂ Concentration (Near-Field Grid Domain, 2004 Meteorological data; includes background)





Appendix 15 Survey for *Althaea Hirsuta*



**PROPOSED BIOMASS
POWER PLANT,
BARRY, SOUTH
WALES**

**SURVEY FOR
ALTHAEA HIRSUTA
(ROUGH MARSH-
MALLOW)**

**Prepared for Sunrise
Renewables**

January 2009

RSK GENERAL NOTES

Project No: P660003

Title: Proposed Biomass Power Plant, Barry, South Wales
Survey for Althaea Hirsuta (Rough Marsh-mallow)

Client: Sunrise Renewables

Issue Date: 23rd January 2009

Issuing Office: Manchester

Authorised by: Rob Domeney **Project Manager** **Date:** 23/12/08

Authorised by: Sarah Harmer **Project QA Rep** **Date:** 23/12/08

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1 INTRODUCTION

1.1 Purpose of the Report

This report details a survey of a land-parcel at Barry Docks (OS Grid Reference ST 126 676) to assess its suitability for a legally protected plant species, viz. *Althaea hirsuta* (Rough Marsh-mallow), which has been recorded in the ten-kilometre grid-square. It provides background information on the species (hereafter generally referred to as *Althaea*), describes the site and its vegetation, and evaluates the likelihood of *Althaea* being present.

The survey was commissioned by Sunrise Renewables Ltd and carried out by a botanist from RSK Carter Ecological Ltd on 12th January 2009.

1.2 Site Context

The site comprises a roughly rectangular parcel of derelict land on the north side of Barry Docks bordered by Woodham Road and David Davies Road to the west and south, and areas of derelict land to the east and north (containing hard standing and rough grassland with scattered scrub). A strip of grassland and a railway line separate the site from the wet dock to the south and there is a row of commercial buildings to the west. The wider landscape features a mixture of industrial and post-industrial habitats including a large expanse of newly colonising grassland on derelict land to the west.

1.3 Contents of the Report

This report is set out as follows:

- Section 1 provides introductory material;
- Section 2 describes the desk-study and survey methods;
- Section 3 presents and discusses the results;
- Section 4 gives references;
- Section 5 (Appendix A) gives a plant species list; and
- Section 6 (Appendix B) contains plates.

Plant nomenclature in this report follows Stace (1997). Plant names in the text are given with scientific names first, followed by the English name in brackets. Doubtful identifications are preceded by 'cf.' placed before the specific epithet where the plant is very probably the species indicated, but it is impossible to distinguish it from similar members of the genus with certainty.

2

METHODS**2.1 Background Data Search and Site Visit**

Prior to the site visit, a brief desk-based data-search of published sources was carried out to obtain information on *Althaea hirsuta* (Rough Marsh-mallow).

The site was thoroughly searched for evidence of *Althaea* and the habitat and vegetation types were described. Vascular plant species were listed (*Appendix A*). Subjective estimates of their relative abundance were added using a modified DAFOR scale, which ranks species according to their relative abundance in a given parcel of land as follows: d – dominant, a – abundant, f – frequent, o – occasional, r – rare. In addition, the following prefixes are used: l – locally, v – very. The terms ‘abundant’ and ‘rare’ are used by convention, and apply only to relative-abundance within the recorded area. It does not mean that species are ‘rare’ in the general sense.

January is a poor time of year for most botanical recording purposes. Some species are minimally in evidence as leaves only, and some can be identified from the previous year’s dead remains. But - leaving aside trees, shrubs and large winter-green perennials - many species are not in evidence at all, and whether leaves and dead remains adequate for identification are to be found at a given location is for many species a matter of serendipity. Where these signs are to be found, the presence of a species can often be confirmed, but absence is generally impossible to prove. In January 2009 all this was to some extent exacerbated by cold and frosty weather in the preceding six weeks (as it hastens deterioration of remains and delays development of leaves).

This means that the species list (*Appendix A*) cannot be regarded as exhaustive; many more species would be found in a summer survey. It does, however, adequately indicate the character of the vegetation. The *Althaea* itself normally behaves as a summer- or autumn-germinating winter-annual (*Section 3*), and it is therefore reasonable to expect that leaves would be in evidence in mid-winter. A January survey cannot absolutely prove absence of the *Althaea*, but the likelihood is that if it were present then it could in fact be found.

RESULTS AND EVALUATION**3.1 Background information on *Althaea hirsuta* (Rough Marsh-mallow)**

Althaea hirsuta (Rough Marsh-mallow) is listed on *Schedule 8* of the *Wildlife and Countryside Act 1981* giving it legal protection in England and Wales against intentional picking, uprooting and destruction. It was listed as 'Endangered' in Wigginton (1999), but it is not listed as threatened in the most recent IUCN Red List (Cheffings & Farrell 2005).

Althaea is an annual, or rarely biennial, herb with erect to decumbent stems up to 60 cm; it is coarsely hairy (hispid) and has shallowly lobed (palmate) lower leaves, and deeply divided upper leaves, all with 3-5 lobes (Stace 1997). The flowers are lilac in colour and have five petals 12 to 16 mm in length. In general appearance, it resembles other British species of the Malvaceae such as *Malva moschata* (Musk Mallow).

Althaea behaves mainly as a winter annual in Britain (rarely as a summer annual in wet seasons), flowering from May to early July and setting seed in July and August (Wigginton 1999). It is a poor competitor and requires bare soil for germination and seedling establishment. If conditions are right, germination may follow shortly after seed-set so that identifiable plants are likely to be in evidence by January.

Althaea is considered by many to be an introduced species in Britain, e.g. Stace (1997), Pearman *et al* (2002). However, in Oxfordshire, Somerset and especially in Kent (where it has been known since 1792) it occurs in open, semi-natural vegetation on dry calcareous soils (especially on south-facing slopes), which suggests that it may be native there. From Wigginton (1999) it seems that it usually occurs with at least some distinctly calcicolous associates, either grassland plants or arable weeds, and not with species typical of strongly ruderal or brown-field sites. However, this author does not really discuss the more casual occurrences of *Althaea*.

It also occurs as a casual on waste ground, and as such has been recorded from scattered localities, mostly in southern England and Wales. The most recent county Flora for Glamorgan (Wade *et al.* 1994) listed no recent records, but it has since been recorded from the 10 km square covering Barry Docks (Pearman *et al* 2002).

3.2

Field Survey Results

No evidence of *Althaea hirsuta* (Rough Marsh-mallow) was recorded. Species recorded from the site are listed in *Table 1* in *Appendix A*.

The site largely comprises bare soil or concrete without vegetation. Much of the ground is heavily rutted by vehicles and there is an abundance of fly-tipped rubbish throughout (*Plate 1* in *Appendix B*). Vegetation is confined to scattered, semi-ruderal scrub and grassland along the boundary fences, in the north-east corner, and more particularly at the southern end of the site.

The scattered scrub along the boundary fences mainly consists of *Buddleja davidii* (Butterfly-bush), although there are smaller amounts of *Rosa* species (a Rose) and *Rubus fruticosus* agg. (Bramble). There are small patches of rough grassland with a more or less closed sward alongside scrub in the north-eastern corner of the site and on the verge of David Davies Road. These are dominated by coarse grasses such as *Elytrigia repens* (Common Couch) and also feature the tall umbellifer *Pastinaca sativa* (Wild Parsnip).

The only substantial area of vegetation is at the southern end of the site, where it consists of open, semi-ruderal grassland colonising a substrate of spoil, gravel and concrete (*Plate 2* in *Appendix B*). The sparse sward includes the grasses *Agrostis stolonifera* (Creeping Bent) and *Festuca rubra* (Red Fescue) together with a range of herbs typical of disturbed sites such as *Daucus carota* (Wild Carrot), *Medicago lupulina* (Black Medick), *Senecio erucifolius* (Hoary Ragwort) and *Tripleurospermum inodorum* (Scentless Mayweed). Tall ruderals and garden escapes are also frequent, especially on piles of spoil, and include *Conyza* species (a Fleabane), *Hirschfeldia incana* (Hoary Mustard) and a species of *Salvia* or *Teucrium*.

3.3

Discussion

The strongly ruderal character of this site makes it an unlikely place for *Althaea hirsuta* (Rough Marsh-mallow). If it were present then it could only be so as a passing casual. It is generally accepted that little nature conservation value attaches to such casual occurrences of rare species in atypically ruderal sites (as compared to that attaching to them in semi-natural sites). However, to the best of our understanding, that does not derogate from the legal protection attaching to *Althaea*, which would be just as protected as a casual in this site as it would be as a permanent denizen in a semi-natural site, except in so far as mitigation for development, e.g. transplantation, might be much easier to agree with planning authorities and Countryside Council for Wales.

The species list for the site is typical for a disturbed, more-or-less eutrophic, and neutral to perhaps marginally calcareous ruderal site. Though the substrates contain some calcareous materials, e.g. concrete, mortar from building rubble, this is not very distinctly reflected in the species list, there being no strong calcicoles except for the woody climber *Clematis vitalba* (Traveller's Joy). Species such as *Centranthus ruber* (Red Valerian), *Daucus carota* ssp. *carota* (Wild Carrot), *Foeniculum vulgare* (Fennel), *Fragaria vesca* (Wild Strawberry) and *Pastinaca sativa* (Wild Parsnip) are suggestive of very mildly calcicolous tendencies in the flora, but the great majority of the species listed are widespread on normal ruderal sites across lowland Britain. For vegetation suitable for *Althaea* the species list is not encouraging, but neither is it prohibitive; the species named above could just be congeners of *Althaea*.

The greater part of the site has been so disturbed by vehicles (or by some other previous use) that it supports no vegetation at all, while the rather limited areas of scrub and rough grassland can be discounted as potential habitat for *Althaea* because it would not persist amongst the closed vegetation.

By contrast, the area at the southern end of the site appears to provide good conditions for the germination and establishment of *Althaea*. The vegetation is open and the substrate is free-draining, relatively infertile and perhaps mildly calcareous. Furthermore, similar early-successional grassland not surveyed in surrounding sites could perhaps support *Althaea*, and in that case might act as a seed-source for *Althaea*.

Althaea mainly behaves as a winter annual, and on the balance of probabilities it ought to be in evidence in January, though spring germination (and thence summer annual behaviour) is not unknown in Britain. No *Althaea* or superficially similar species of the Malvaceae were recorded in this survey. Because of the limited area of suitable habitat, it is very unlikely that even poorly-developed specimens would have been missed if they were present.

For the reasons explained above, the absence of *Althaea* cannot absolutely be ruled out from a January survey, and it is always possible that there might be dormant seeds that could germinate in the future. But the failure to find *Althaea* or similar malvaceous species, considered together with the strongly ruderal character of the site and the lack of previous records, make it very unlikely that *Althaea hirsuta* (Rough Marsh-mallow) is present.

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APPENDIX A – SPECIES LIST

Table 1. Vascular plant species recorded from the site on 12/01/2009.

a) Shrubs and woody climbers	
<i>Buddleja davidii</i> (Butterfly-bush)	f
<i>Clematis vitalba</i> (Traveller's-joy)	r
<i>Rosa</i> species (a Rose)	r
<i>Rubus fruticosus</i> agg. (Bramble)	lf
<i>Salix cinerea</i> (Grey Willow)	vr
<i>Sambucus nigra</i> (Elder)	vr
b) Herbaceous species	
<i>Agrostis stolonifera</i> (Creeping Bent)	la
<i>Anagallis arvensis</i> (Scarlet Pimpernel)	vr
<i>Arrhenatherum elatius</i> (False Oat-grass)	r
<i>Artemisia vulgaris</i> (Mugwort)	r
<i>Bromus hordeaceus</i> (Soft-brome)	r
<i>Cardamine hirsuta</i> (Hairy Bitter-cress)	r
<i>Centranthus ruber</i> (Red Valerian)	r
<i>Chamerion angustifolium</i> (Rosebay Willowherb)	vr
<i>Cirsium arvense</i> (Creeping Thistle)	r
<i>Cirsium vulgare</i> (Spear Thistle)	vr
<i>Conyza</i> species (a Fleabane)	o
<i>Dactylis glomerata</i> (Cock's-foot)	vr
<i>Daucus carota</i> (Wild Carrot)	o
<i>Dipsacus fullonum</i> (Teasel)	vr
<i>Dryopteris filix-mas</i> (Male-fern)	vr
<i>Elytrigia repens</i> (Common Couch)	la
<i>Epilobium ciliatum</i> (American Willowherb)	r
<i>Epilobium parviflorum</i> (Hoary Willowherb)	vr
<i>Eupatorium cannabinum</i> (Hemp-agrimony)	r
<i>Festuca rubra</i> (Red Fescue)	o
<i>Foeniculum vulgare</i> (Fennel)	vr
<i>Fragaria vesca</i> (Wild Strawberry)	vr
<i>Galium aparine</i> (Cleavers)	vr
<i>Galium mollugo</i> (Hedge Bedstraw)	r
<i>Geranium dissectum</i> (Cut-leaved Crane's-bill)	vr
<i>Geranium lucidum</i> (Shining Crane's-bill)	vr
<i>Geranium robertianum</i> (Herb-Robert)	r
<i>Geranium rotundifolium</i> (Round-leaved Crane's-bill)	r
<i>Hirschfeldia incana</i> (Hoary Mustard)	f
<i>Hypericum humifusum</i> (Trailing St John's-wort)	r
<i>Leucanthemum vulgare</i> (Oxeye Daisy)	r
<i>Linaria vulgaris</i> (Common Toadflax)	r
<i>Lotus corniculatus</i> (Common Bird's-foot-trefoil)	r
<i>Medicago lupulina</i> (Black Medick)	o
<i>Melilotus</i> species (a Melilot)	r
<i>Myosotis sylvatica</i> (Wood Forget-me-not)	vr
<i>Oenothera</i> species (an Evening-primrose)	r

<i>Pastinaca sativa</i> (Wild Parsnip)	vlf
<i>Picris echinoides</i> (Bristly Oxtongue)	r
<i>Picris hieracioides</i> (Hawkweed Oxtongue)	r
<i>Plantago lanceolata</i> (Ribwort Plantain)	r
<i>Poa annua</i> (Annual Meadow-grass)	r
<i>Potentilla reptans</i> (Creeping Cinquefoil)	vr
<i>Prunella vulgaris</i> (Selfheal)	vr
<i>Pulicaria dysenterica</i> (Common Fleabane)	vr
<i>Ranunculus repens</i> (Creeping Buttercup)	vlf
<i>Reseda luteola</i> (Weld)	r
<i>Rumex crispus</i> (Curled Dock)	r
<i>Rumex obtusifolius</i> (Broad-leaved Dock)	r
<i>Salvia</i> or <i>Teucrium</i> species (a Clary or Sage)	lf
<i>Senecio erucifolius</i> (Hoary Ragwort)	o
<i>Senecio jacobaea</i> (Common Ragwort)	r
<i>Senecio vulgaris</i> (Groundsel)	vr
<i>Sonchus oleraceus</i> (Smooth Sow-thistle)	vr
<i>Sisymbrium officinale</i> (Hedge Mustard)	r
<i>Taraxacum</i> sect. <i>Ruderalia</i> (Common Dandelion)	r
<i>Trifolium medium</i> (Zigzag Clover)	vr
<i>Trifolium pratense</i> (Red Clover)	vr
<i>Trifolium repens</i> (White Clover)	r
<i>Tripleurospermum inodorum</i> (Scentless Mayweed)	o
<i>Vicia sativa</i> (Common Vetch)	r

APPENDIX B – PHOTOGRAPHS



Plate 1. Looking from west to east across the site.



Plate 2. Open semi-ruderal grassland colonising the southern corner of the site.



Appendix 16 Environmental Data Report



Oaktree Environmental
Unit 5 Oasis Park, Road 1,
Winsford Industrial Estate, Winsford,
CW7 3PP

GroundSure Reference: HMD-188-62960
Your Reference: Barry
Report Date: Mar 6, 2008
Report Delivery Method: xml
Client Email: marco@oaktree-environmental.co.uk

GroundSure Environmental Data Report

Address: WOODHAM ROAD, DOCKS, BARRY, CF62

Dear Sir/Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure Environmental Data Report** as requested.

If you need any further assistance, please do not hesitate to contact our maps and data helpline on 01273 819700 or email maps&data@groundsure.com quoting the above GroundSure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
GroundSure Environmental Data Report

GroundSure Environmental Data Report

Address: WOODHAM ROAD, DOCKS, BARRY, CF62

Date: Mar 6, 2008

GroundSure Reference: HMD-188-62960

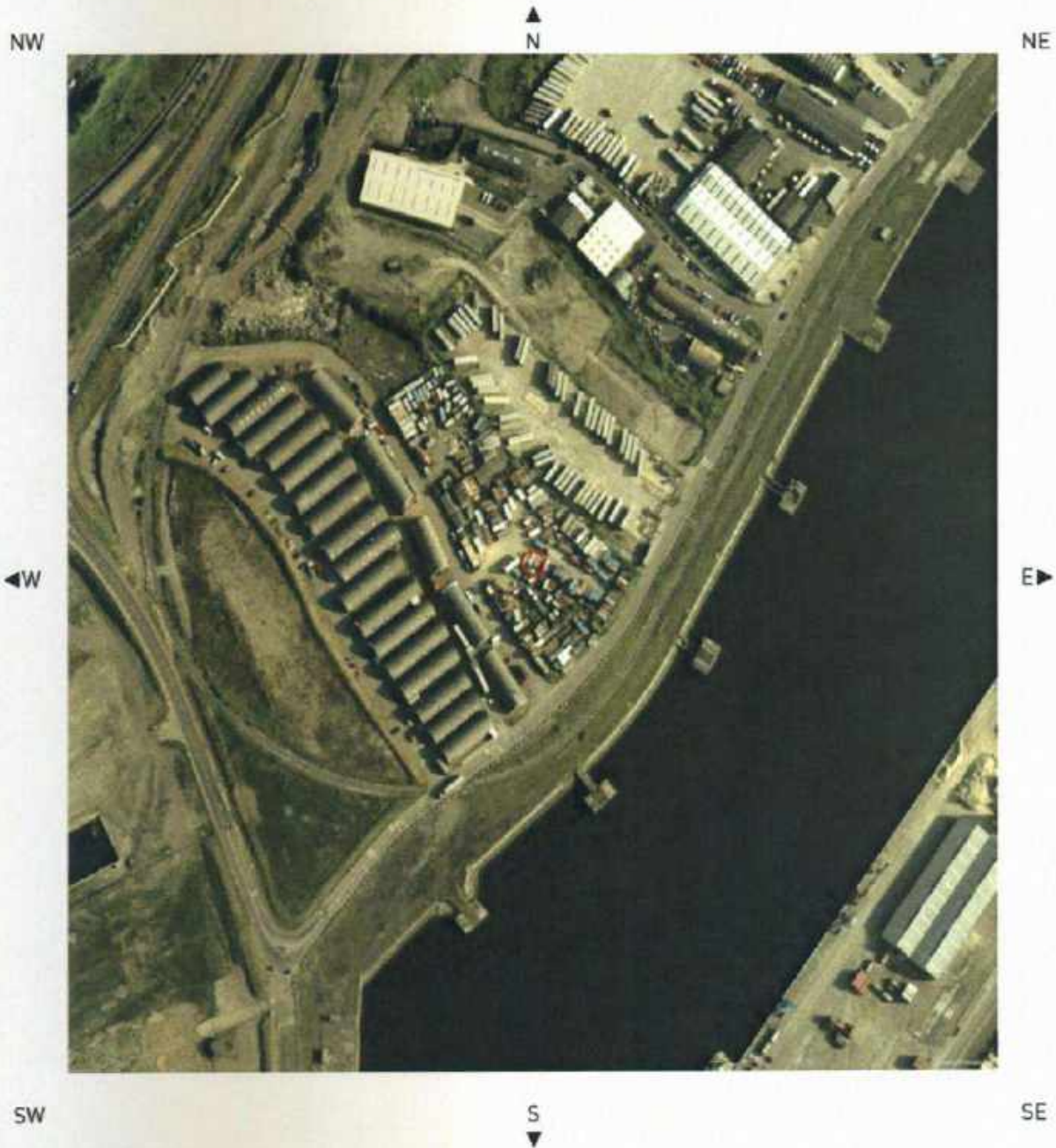
Your Reference: Barry

Client: Oaktree Environmental



Brought to you by GroundSure

Aerial Photograph of Study Site



Site Name: WOODHAM ROAD, DOCKS, BARRY, CF62
Grid Reference: 312620,167670

Aerial photography supplied by Getmapping PLC.
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Overview of Findings

For further details on each dataset, please refer to each individual section in the main Report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary					
	on-site	0-50	51-250	251-500	501-1000	1000-1500
1. Authorisations, Incidents and Registers						
1.1 Industrial Sites Holding Licenses and/or Authorisations						
Records of IPC Authorisations	0	0	0	0	0	-
Records of IPPC Authorisations	0	0	0	7	12	-
Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0	-	-
Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0	-	-
Records of List 1 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of LAPPC (LAPC) Authorisations	0	0	0	2	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0	-	-
Records of Licensed Discharge Consents	0	1	1	1	-	-
1.2 Records of COMAH and NIHHS sites	0	0	0	0	-	-
1.3 Environment Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	0	0	2	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-
2. Landfill and Other Waste Sites						
2.1 Landfill Sites						
Environment Agency Registered landfill Sites	0	0	0	0	1	0
Landfill Data - Operational Landfill Sites	0	0	0	0	1	0
Environment Agency Historic Landfill Sites	0	0	1	3	3	2
Landfill Data - Non-Operational Landfill Sites	0	0	0	1	2	2
BGS/DoE Landfill Site Survey	0	0	0	0	0	0
GroundSure Local Authority Landfill Sites Data	0	0	0	1	0	0
2.2 Landfill and Other Waste Sites Findings						
Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Environment Agency (REGIS) Waste Sites	0	0	0	9	15	16
3. Current Land Uses						
3.1 Current Industrial Sites Data	0	0	21	35	-	-
3.2 Records of Petrol and Fuel Sites	0	0	0	0	-	-
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0	-	-

4. Geology	Description.
4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? *	Yes
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section. Source: Scale: 1:50,000 BGS Sheet 263	

* This includes an automatically generated 50m buffer zone around the site.

5. Hydrogeology and Hydrology	on-site	0-50	51-250	251-500	501-1000	1001-2000*
5.1 Environment Agency Groundwater Vulnerability and Soil Classification						
Minor Aquifer (within 200m)	No	No	Yes	-	-	-
Major Aquifer (within 200m)	No	No	No	-	-	-
Soil Classification (within 200m)	No	No	Yes	-	-	-
5.2 Groundwater Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	6
5.3 Surface Water Abstraction Licences (within 1000m of the study site).	0	0	0	0	15	-
5.4 Source Protection Zones						
Source Protection Zones within 500m of the study site.	0	0	0	0	-	-
5.5 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	0
5.6 River Quality						
Is there any Environment Agency information on river quality within 500m of the study site?	No	No	No	No	-	-
5.7 Main Rivers						
Main Rivers within 500m of the study site.	0	0	0	0	-	-

6. Flooding	
6.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site?	Yes
6.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site?	Yes
6.3 Are there any Areas benefiting from Flood Defences within 250m of the study site?	No
6.4 Are there any Areas used for Flood Storage within 250m of the study site?	No
6.5 What is the maximum BGS groundwater flooding susceptibility within 50m of the study site?	High
6.6 What is the BGS confidence rating for the groundwater flooding susceptibility areas?	Moderate



7. Ecological Designated Sites	on-site	0-50	51-250	251-500	501-1000	1001-1500
7.1 Records of Sites of Special Scientific Interest (SSSI):	0	0	0	0	1	-
7.2 Records of National Nature Reserves (NNR) :	0	0	0	0	0	-
7.3 Records of Local Nature Reserves (LNR):	0	0	0	0	0	-
7.4 Records of Special Areas of Conservation (SAC):	0	0	0	0	0	-
7.5 Records of Special Protection Areas (SPA):	0	0	0	0	0	-
7.6 Records of Ramsar sites:	0	0	0	0	0	-
7.7 Records of World Heritage Sites:	0	0	0	0	0	-

8. Natural Hazards

8.1 What is the maximum risk of natural ground subsidence? Very Low

9. Mining

9.1 Are there any coal mining areas within 75m of the study site? No
9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site? Negligible



Using this Report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client. The document contains the following sections:

1. Authorisations, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by the Environment Agency, and sites determined as Contaminated Land. This search is conducted using radii up to 1000m.

2. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

3. Current Land Uses

Provides information on artificial and superficial deposits and bedrock beneath the study site. These searches are conducted onsite and includes a 50m buffer zone.

4. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site. These searches are conducted using radii of up to 250m and includes a 50m buffer zone.

5. Hydrogeology and Hydrology

Provides information on groundwater vulnerability, soil leaching potential, abstraction licenses, Source Protection Zones (SPZ) and river quality. These searches are conducted using radii of up to 2000m.

6. Flooding

Provides information on surface water flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

7. Ecological Designated Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR) and World Heritage Sites. These searches are conducted using radii of up to 1000m.

8. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These searches are conducted using radii of up to 75m.

9. Mining

Provides information on areas of coal and shallow mining. These searches are conducted using radii of up to 150m.



10. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, GroundSure provide a free Technical Helpline (01273 819700) for further information and guidance.

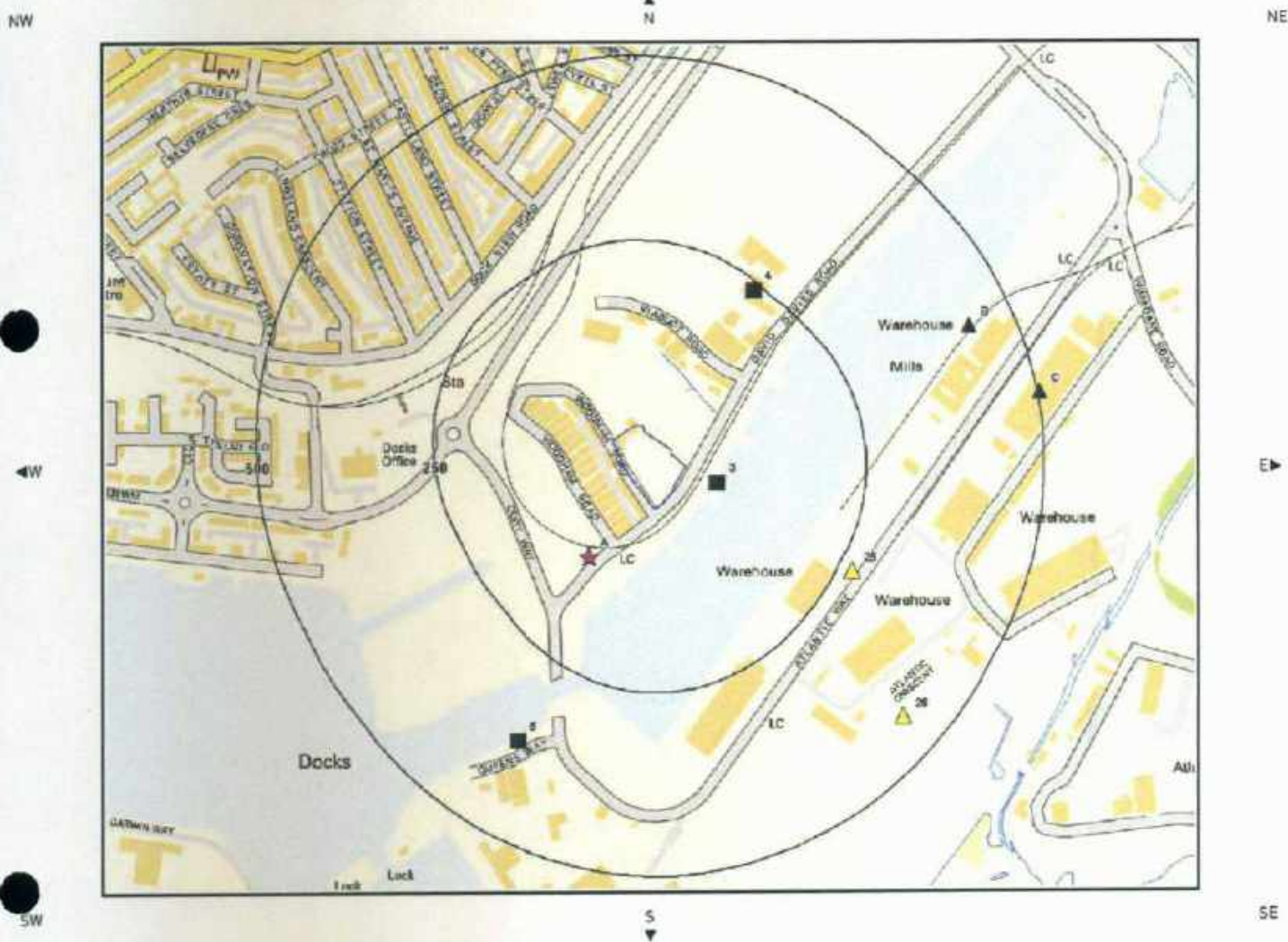
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).













Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Authorisations, Incidents and Registers Map



Incidents and Registers Legend

- | | | | | | |
|---|-------------------------------|---|-----------------------------|---|---------------------------------------|
|  | Site Outline |  | Recorded Pollution Incident |  | RAS 3 & 4 Authorisations |
|  | Dangerous Substances (List 1) |  | Water Industry Referrals |  | IPPC & IPC Authorisations |
|  | Dangerous Substances (List 2) |  | Licensed Discharge Consents |  | LAPPC Authorisations |
|  | Search Buffers (m) |  | Red List Discharge Consents |  | COMAH / NIHS Sites |
| | | | |  | Sites Determined as Contaminated Land |


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1. Authorisations, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

Records of Part A Licences (IPC Processes) within 1000m of the study site:

0

Database searched and no data found.

Records of Part A Licences (IPPC Processes) within 1000m of the study site:

19

The following Part A Licences (IPPC Processes) are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Operator	Installation Name	Status	Details
6B	436.0	NE	313070,167850	Operator: Rank Hovis Limited	Installation Name: Barry Flour Mill	Status: Effective	Permit Number: BP3376IE Original Permit Number: BP3376IE Issue Date: 17/08/2005 Effective Date: 17/08/2005
7B	436.0	NE	313070,167850	Operator: Rank Hovis Limited	Installation Name: Barry Flour Mill	Status: Effective	Permit Number: BP3376IE Original Permit Number: BP3376IE Issue Date: 17/08/2005 Effective Date: 17/08/2005
8B	436.0	NE	313070,167850	Operator: Rank Hovis Ltd	Installation Name: Rank Hovis Ltd Barry	Status: Determination	Permit Number: BP3376IE Original Permit Number: BP3376IE Issue Date: - Effective Date: -
9B	436.0	NE	313070,167850	Operator: Rank Hovis Ltd	Installation Name: Barry Flour Mill	Status: Effective	Permit Number: BP3376IE Original Permit Number: BP3376IE Issue Date: 17/08/2005 Effective Date: 17/08/2005
10B	436.0	NE	313070,167850	Operator: Rank Hovis Ltd	Installation Name: Barry Flour Mill	Status: Effective	Permit Number: BP3376IE Original Permit Number: BP3376IE Issue Date: 17/08/2005 Effective Date: 17/08/2005
11B	436.0	NE	313070,167850	Operator: Rank Hovis Limited	Installation Name: Barry Flour Mill	Status: Effective	Permit Number: BP3376IE Original Permit Number: BP3376IE Issue Date: 20050817 Effective Date: 20050817
12B	436.0	NE	313070,167850	Operator: Rank Hovis Limited	Installation Name: Barry Flour Mill	Status: Effective	Permit Number: BP3376IE Original Permit Number: BP3376IE Issue Date: 20050817 Effective Date: 20050817
13C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd.	Installation Name: Barry Aluminium Chlorohydrate Plant	Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 07/11/2005 Effective Date: 07/11/2005
14C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd	Installation Name: Barry Aluminium Chlorohydrate Plant	Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 07/11/2005 Effective Date: 07/11/2005
15C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd	Installation Name: Barry Aluminium Chlorohydrate Plant	Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 07/11/2005 Effective Date: 07/11/2005
16C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd.	Installation Name: Barry Aluminium Chlorohydrate Plant	Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 07/11/2005 Effective Date: 07/11/2005
17C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd	Installation Name: Barry Aluminium Chlorohydrate Plant	Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 20051107 Effective Date: 20051107
18C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd	Installation Name: Barry Aluminium Chlorohydrate Plant	Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 20051107 Effective Date: 20051107

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19C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd Installation Name: Barry Aluminium Chlorohydrate Plant Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 20051107 Effective Date: 20051107
20C	503.0	E	313170,167760	Operator: Alembic Manufacturing Ltd Installation Name: Barry Aluminium Chlorohydrate Plant Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 20051107 Effective Date: 20051107
Not shown	991.0	SE	313170,166770	Operator: Alembic Manufacturing Ltd. Installation Name: Barry Aluminium Chlorohydrate Plant Status: Determination	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: - Effective Date: -
Not shown	991.0	SE	313170,166770	Operator: Alembic Manufacturing Ltd. Installation Name: Barry Aluminium Chlorohydrate Plant Status: Determination	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: - Effective Date: -
Not shown	991.0	SE	313170,166770	Operator: Alembic Manufacturing Ltd. Installation Name: Barry Aluminium Chlorohydrate Plant Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 07/11/2005 Effective Date: 07/11/2005
Not shown	991.0	SE	313170,166770	Operator: Alembic Manufacturing Ltd. Installation Name: Barry Aluminium Chlorohydrate Plant Status: Effective	Permit Number: MP3431SP Original Permit Number: MP3431SP Issue Date: 07/11/2005 Effective Date: 07/11/2005

Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 0

Database searched and no data found.

Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 0

Database searched and no data found.

Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of LAPPC (LAPC) Authorisations within 500m of the study site: 2

The following LAPPC (LAPC) Authorisations are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details
25	270.0	SE	312906.0,167519.0	Address: Hanson Building Material Europe Limited, Atlantic Trading Estate, Wimborne Road, Barry Docks, Barry Process: Cement Batching Status: 20040401
26	443.0	SE	312978.0,167320.0	Address: Apex Coal Ltd., Coal Yard, No. 2 Dock, Off Atlantic Way, Barry Docks, Barry. Process: Coal Handling Status: Current Date: 2004

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: 0

Database searched and no data found.

Records of Licenced Discharge Consents within 500m of the study site: 3

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GroundSure Environmental Data Report Reference: HMD-188-62960

The following Licenced Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
3	48.0	SE	312720,167640	Address: Fisher Containers David Davies Road, Fisher Containers David Davies R, David Davies Road Barry Dock Bar, Barry Dock Barry .. Barry . Effluent Type: Unspecified Permit Number: AN0033206 Permit Version: 2	Receiving Water: Barry Docks Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 00/11/10/7 Effective Date: - Revocation Date: -
4	239.0	NE	312770,167900	Address: Factory At David Davies Road Barry, Factory At David Davies Road, Barry Docks, Barry, Vale Of Glamorgan Effluent Type: Unspecified Permit Number: AN0238001 Permit Version: 1	Receiving Water: Barry Docks Status: New Consent, By Application (wra 91, Section 88) Issue date: 00/01/27/1 Effective Date: - Revocation Date: -
5	370.0	SW	312440,167290	Address: Brt International Ltd, No3 Dock, Barry Docks, CF63 3RA Effluent Type: Unspecified Permit Number: AN0033237 Permit Version: 2	Receiving Water: Barry Docks Status: Modified - (wra 91 Sched 10 - As Amended By Env Act 1995) Issue date: 00/19/9/7/1 Effective Date: - Revocation Date: -

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: 2

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
1A	112.0	SW	312540,167540	Incident Date: 16-Dec-2002 Incident Identification: 126244 Pollutant: - Pollutant Description: -	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2A	112.0	SW	312540,167540	Incident Date: 16-Dec-2002 Incident Identification: 126244 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

Records of National Incidents Recording System, List 1 within 250m of the study site: 0

Database searched and no data found.

1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990¹

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

¹Further information on sites that have been determined under the Contaminated Land Regime is maintained by Local Authorities under Section 78R of the Environmental Protection Act 1990. Information should be available on both sites currently determined as Contaminated Land and Special Sites.

2. Landfill and Other Waste Sites Map

NW

N

NE



SW












SE

SW

SE

Landfill & Other Waste Sites Legend


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- | | | | | | |
|---|--------------------|---|---------------------------------------|---|-------------------------------------|
|  | Site Outline |  | E.A. Active Landfill |  | Operational Waste Treatment Licence |
|  | Search Buffers (m) |  | E.A. Historic Landfill (Area Data) |  | Closed Waste Treatment Licence |
|  | |  | E.A. Historic Landfill (Point Data) |  | REGIS Waste Licence |
| | |  | BGS / DoE Survey Landfill |  | Operational Landfill |
| | |  | Local Authority Landfill (Area Data) |  | Closed Landfill |
| | |  | Local Authority Landfill (Point Data) | | |

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2. Landfill and Other Waste Sites

2.1 Landfill Sites¹

Records from Environment Agency landfill data within 1000m of the study site:

1

The following Environment Agency landfill records are represented as polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details	
Not shown	897.0	NE	313462.0,168356.0	Address: Dow Corning Landfill, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Landfill Reference: 30043.0 Regis Reference: DOW001 Landfill Type: A7 - Industrial Waste Landfill (Factory curtilage)	Operator: Dow Corning Ltd Status: Licence issued IPPC Reference:

Records of operational landfill sites sourced from Landmark within 1500m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details	
Not shown	964.0	NE	313400.0,168300.0	Site Address: Dow Corning Factory, East No 2 Dock, BARRY, South Glamorgan, Agency Reference: EAWML30043 Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: Waste produced/controlled by licence holder	Record Date: 01-Apr-1991 Transfer Date: Modification Date: 01-Mar-1999 Status: Operational as far as is known Category: LANDFILL Regulator: EA - Welsh Region - South East Area (Cardiff) Size: Undefined

Records of Environment Agency historic landfill sites within 1500m of the study site:

9

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details	
8	177.0	SW	312300,167500	Site Address: Barry Graving Dock, Off Cory Way, Barry, Vale Of Glamorgan Waste Licence: Yes Site Reference: 61 Waste Type: Industrial, Household, Special Regis Reference: WU1/L/ASS001	Data Type: Polygon Licence Issue: 11-Oct-1994 Licence Surrendered: 16-Jan-2006 Licence Hold Address: 150 Holborn, London Operator: Associated British Ports
9	334.0	SE	312900,167200	Site Address: Barry Docks Area A, Atlantic Trading Estate, Atlantic Crescent, Barry, South Glamorgan Waste Licence: Yes Site Reference: 4 Waste Type: Industrial, Special, Liquid sludge Regis Reference: -	Data Type: Polygon Licence Issue: 26-Oct-1977 Licence Surrendered: 31-Dec-1978 Licence Hold Address: - Operator: BP Chemicals Limited

¹This information is gathered from a wide range of sources including, the Environment Agency (Agency), The British Geological Survey (BGS) and under licence from Landmark Information Group Limited®. Data supplied by Landmark Information Group Limited® and the Agency refers to waste management licences required (under either the Control of Pollution Act 1974 and/or the Environmental Protection Act 1990) by anyone involved in waste disposal. A survey by the BGS undertaken in 1972/3 provides data on some older landfill sites that were not subject to legislation. Environment Agency data on historic waste / landfill sites is still being updated by the Agency as part of an ongoing project. GroundSure use this data because more accurate data is not yet publicly available and will use enhanced Environment Agency data when it is released.



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10	334.0	SE	312800,167100	Site Address: Barry Docks Area A and B, Atlantic Trading Estate, Atlantic Crescent, Barry, South Glamorgan Waste Licence: Yes Site Reference: 16 Waste Type: Inert, Industrial, Commercial, Household, Special Regis Reference: -	Data Type: Polygon Licence Issue: 15-Mar-1979 Licence Surrendered: Licence Hold Address: - Operator: BP Chemicals Limited
11	494.0	S	312700,166900	Site Address: Barry Docks Area B, Atlantic Trading Estate, Atlantic Crescent, Barry, South Glamorgan Waste Licence: Yes Site Reference: 8 Waste Type: Industrial Regis Reference: -	Data Type: Polygon Licence Issue: 27-Feb-1978 Licence Surrendered: 31-Dec-1978 Licence Hold Address: - Operator: BP Chemicals Limited
12A	531.0	E	313300,167700	Site Address: Atlantic Trading Estate, Barry Dock No 2, Wimbourne Road, Barry, South Glamorgan Waste Licence: - Site Reference: 6950/0060 Waste Type: Inert, Industrial, Household, Special Regis Reference: -	Data Type: Polygon Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: Penarth Contractor
13A	531.0	E	313300,167700	Site Address: Barry Dock No.1, Atlantic Trading Estate, Wimbourne Road, Barry, South Glamorgan Waste Licence: Yes Site Reference: 6, 6950/0025 Waste Type: Inert, Industrial, Household Regis Reference: -	Data Type: Polygon Licence Issue: 02-Nov-1977 Licence Surrendered: 31-Dec-1978 Licence Hold Address: - Operator: F J H Brackett
14	793.0	NE	313500,168200	Site Address: Barry Factory Salt Water Pond, Wimbourne Road, Barry, South Glamorgan Waste Licence: Yes Site Reference: 22A Waste Type: Inert, Industrial, Household, Special, Liquid sludge Regis Reference: -	Data Type: Polygon Licence Issue: 19-Dec-1980 Licence Surrendered: Licence Hold Address: - Operator: Dow Corning Limited
Not shown	1097.0	NE	313700,168300	Site Address: Barry Factory Ponds A, B and C, Wimbourne Road, Barry, South Glamorgan Waste Licence: Yes Site Reference: 9 Waste Type: Industrial Regis Reference: -	Data Type: Polygon Licence Issue: 06-Apr-1978 Licence Surrendered: Licence Hold Address: - Operator: Dow Corning Limited
Not shown	1438.0	W	311100,167000	Site Address: West Pond, Barry, South Glamorgan Waste Licence: - Site Reference: - Waste Type: Inert, Industrial, Commercial, Household, Special Regis Reference: -	Data Type: Polygon Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

Records of non-operational landfill sites sourced from Landmark within 1500m of the study site:

5

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
2	332.0	SW	312300.0,167500.0	Site Address: Graving Docks 1 & 2 and Barry No.1 Dock, off Cory Way, BARRY, South Glamorgan, Landfill Licence: W7BABWAL Agency Reference: EAWML30147 Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: Only waste produced on site Record Date: 01-Oct-1994 Transfer Date: Modification Date: 01-Nov-1999 Status: Site closed Category: LANDFILL Regulator: EA - Welsh Region - South East Area (Cardiff) Size: Large (← 250,000 tonnes/year)

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Not shown	708.0	S	312700.0,166900.0	Site Address: Atlantic Trading Estate, Barry Dock, BARRY, South Glamorgan, Landfill Licence: W7BAATAL Agency Reference: Waste Type: Putrescible Waste Description: Putrescible Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Mar-1979 Transfer Date: Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - Welsh Region - South East Area (Cardiff) Size: Undefined
Not shown	964.0	NE	313400.0,168300.0	Site Address: Dow Corning Factory, East No 2 Dock, BARRY, South Glamorgan, Landfill Licence: W7BAAAAL Agency Reference: Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: Only waste produced on site	Record Date: 01-Dec-1980 Transfer Date: Modification Date: Status: Record superseded Category: LANDFILL Regulator: EA - Welsh Region - South East Area (Cardiff) Size: Very Small (<=10,000 tonnes/year)
Not shown	1078.0	W	311500.0,167795.0	Site Address: Barry Docks, BARRY, South Glamorgan, Landfill Licence: W7BAALAL Agency Reference: Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Jun-1985 Transfer Date: Modification Date: Status: Licence lapsed/cancelled/defunct/not applicable/surrendered Category: LANDFILL Regulator: EA - Welsh Region - South East Area (Cardiff) Size: Undefined
Not shown	1078.0	W	311500.0,167800.0	Site Address: Barry Docks, BARRY, South Glamorgan, Landfill Licence: W7BAAEAL Agency Reference: Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: No known restriction on source of waste	Record Date: 01-Mar-1979 Transfer Date: Modification Date: Status: Record superseded Category: LANDFILL Regulator: EA - Welsh Region - South East Area (Cardiff) Size: Small (<=25,000 tonnes/year)

Records of BGS/DoEnon-operational landfill sites within 1500m of the study site: 0

Database searched and no data found.

Records of Local Authority landfill sites within 1500m of the study site: 1

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	Site Address	Source	Data Type
57	615.0	W	Barry Graving Dock, The Waterfront, Barry	Vale of Glamorgan Council	Point

2.2 Other Waste Sites¹

Records of operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Database searched and no data found.

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Database searched and no data found.

¹This information is gathered from a wide range of sources including, the Environment Agency (Agency), The British Geological Survey (BGS) and under licence from Landmark Information Group Limited. Data supplied by Landmark Information Group Limited and the Agency refers to waste management licences required (under either the Control of Pollution Act 1974 and/or the Environmental Protection Act 1990) by anyone involved in waste disposal. A survey by the BGS undertaken in 1972/3 provides data on some older landfill sites that were not subject to legislation. Environment Agency data on historic waste / landfill sites is still being updated by the Agency as part of an ongoing project. GroundSure use this data because more accurate data is not yet publicly available and will use enhanced Environment Agency data when it is released.



Records of Environment Agency (REGIS) waste sites within 1500m of the study site:

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
17B	295.0	SW	312329,167525	<p>Site Address: Graving Docks Landfill, 1 & 2 Dock, Off Cory Way, Barry Docks, Barry, Vale Of Glam, CF1 7QB Type: Other landfill sites taking special waste Size: →= 75000 tonnes Regis Licence Number: ASS001 Operator: Associated British Ports Surrendered Date: - Waste Management licence No: 30147 Annual Tonnage: 0.0</p> <p>Issue Date: 11/10/1994 Expiry Date: - Effective Date: - Status: Closure Modified: - Site Name: Graving Dock Cancelled Date: - Correspondence Address: 150, Holborn Road, London, . EC1 2LR</p>
18B	295.0	SW	312329,167525	<p>Site Address: Graving Docks Landfill, 1 & 2 Dock, Off Cory Way, Barry Docks, Barry, Vale Of Glam, CF1 7QB Type: - Size: 1 Regis Licence Number: - Operator: Associated British Ports Surrendered Date: - Waste Management licence No: 30147 Annual Tonnage: 0.0</p> <p>Issue Date: - Expiry Date: - Effective Date: - Status: - Modified: - Site Name: Graving Dock Cancelled Date: - Correspondence Address: . .</p>
19B	295.0	SW	312329,167525	<p>Site Address: Graving Docks Landfill, 1 & 2 Dock, Off Cory Way, Barry Docks, Barry, Vale Of Glam, CF1 7QB Type: Other landfill sites taking special waste Size: ← 25000 tonnes Regis Licence Number: ASS001 Operator: Associated British Ports Surrendered Date: 16/1/2006 Waste Management licence No: 30147 Annual Tonnage: 300000.0</p> <p>Issue Date: 11/10/1994 Expiry Date: - Effective Date: - Status: Surrendered Modified: - Site Name: Graving Dock Cancelled Date: 0 Correspondence Address: Arup, 4, Pierhead Street, Capital Waterside, Cardiff, CF10 4QP</p>
20B	295.0	SW	312329,167525	<p>Site Address: Graving Docks Landfill, 1 & 2 Dock, Off Cory Way, Barry Docks, Barry, Vale Of Glam, CF1 7QB Type: Other landfill sites taking special waste Size: →= 75000 tonnes Regis Licence Number: ASS001 Operator: Associated British Ports Surrendered Date: - Waste Management licence No: 30147 Annual Tonnage: 0.0</p> <p>Issue Date: 11/10/1994 Expiry Date: - Effective Date: - Status: Closure Modified: - Site Name: Graving Dock Cancelled Date: - Correspondence Address: Alan Stark, 150, Holborn Road, , London, . EC1 2LR</p>
21B	295.0	SW	312329,167525	<p>Site Address: Graving Docks Landfill, 1 & 2 Dock, Off Cory Way, Barry Docks, Barry, Vale Of Glam, CF1 7QB Type: Other landfill sites taking special waste Size: →= 75000 tonnes Regis Licence Number: ASS001 Operator: Associated British Ports Surrendered Date: - Waste Management licence No: 30147 Annual Tonnage: 0.0</p> <p>Issue Date: 11/10/1994 Expiry Date: - Effective Date: - Status: Closure Modified: - Site Name: Graving Dock Cancelled Date: - Correspondence Address: Arup, 4, Pierhead Street, Capital Waterside, Cardiff, CF10 4QP</p>
22C	470.0	E	313114,167490	<p>Site Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, South Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: LEV001 Operator: Levics Len Surrendered Date: - Waste Management licence No: 30362 Annual Tonnage: 2499.0</p> <p>Issue Date: 14/6/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Levics Vehicle Dismantlers Cancelled Date: - Correspondence Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, South Glam, CF63 3RF</p>

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23C	470.0	E	313114,167690	Site Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, Vale Of Glam, CF63 3RG Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: LEV001 Operator: Levics Len Surrendered Date: - Waste Management licence No: 30362 Annual Tonnage: 2499.0	Issue Date: 14/6/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Levics Vehicle Dismantlers Cancelled Date: - Correspondence Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, Vale Of Glam, CF63 3RF
24C	470.0	E	313114,167690	Site Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, Vale Of Glam, CF63 3RG Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: LEV001 Operator: Levics Len Surrendered Date: - Waste Management licence No: 30362 Annual Tonnage: 2499.0	Issue Date: 14/6/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Levics Vehicle Dismantlers Cancelled Date: 0 Correspondence Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, Vale Of Glam, CF63 3RF
25C	470.0	E	313114,167690	Site Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, Vale Of Glam, CF63 3RG Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: LEV001 Operator: Levics Len Surrendered Date: - Waste Management licence No: 30362 Annual Tonnage: 2499.0	Issue Date: 14/6/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Levics Vehicle Dismantlers Cancelled Date: - Correspondence Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, Vale Of Glam, CF63 3RF
26D	504.0	E	313180,167691	Site Address: Atlantic Salvage Company, 22, Atlantic Business Park, Barry Docks, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: COM003 Operator: Comerford David John Surrendered Date: - Waste Management licence No: 30354 Annual Tonnage: 2499.0	Issue Date: 29/9/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Atlantic Salvage Company Cancelled Date: - Correspondence Address: 22, Barry Docks, Atlantic Business Park, Barry, Vale Of Glam, CF63 3RF
27D	504.0	E	313180,167691	Site Address: Atlantic Salvage Company, 22, Atlantic Business Park, Barry Docks, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: COM003 Operator: Comerford David John Surrendered Date: - Waste Management licence No: 30354 Annual Tonnage: 2499.0	Issue Date: 29/9/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Atlantic Salvage Company Cancelled Date: - Correspondence Address: 22, Barry Docks, Atlantic Business Park, Barry, Vale Of Glam, CF63 3RF
28D	504.0	E	313180,167691	Site Address: Atlantic Salvage Company, 22, Atlantic Business Park, Barry Docks, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: COM003 Operator: Comerford David John Surrendered Date: - Waste Management licence No: 30354 Annual Tonnage: 2499.0	Issue Date: 29/9/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Atlantic Salvage Company Cancelled Date: 0 Correspondence Address: 22, Barry Docks, Atlantic Business Park, Barry, Vale Of Glam, CF63 3RF
29D	504.0	E	313180,167691	Site Address: 22, Atlantic Business Park, Barry Docks, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: COM003 Operator: Comerford David John Surrendered Date: - Waste Management licence No: 30354 Annual Tonnage: 2499.0	Issue Date: 29/9/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Atlantic Salvage Company Cancelled Date: - Correspondence Address: 22 Atlantic Business Park, Barry Docks, Barry, Vale Of Glam, CF63 3RF

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30D	504.0	E	313180,167691	Site Address: Atlantic Salvage Company, 22, Atlantic Business Park, Barry Docks, Barry, South Glamorgan, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: COM003 Operator: Comerford David John Surrendered Date: - Waste Management licence No: 30354 Annual Tonnage: 2499.0	Issue Date: 29/9/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Atlantic Salvage Company Cancelled Date: - Correspondence Address: 22, Barry Docks, Atlantic Business Park, Barry, South Glamorgan, CF63 3RF
31E	508.0	E	313162,167511	Site Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, South Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: LEV001 Operator: Levis Len Surrendered Date: - Waste Management licence No: 30362 Annual Tonnage: 0.0	Issue Date: 14/6/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Levis Vehicle Dismantlers Cancelled Date: - Correspondence Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, South Glam, CF63 3RF
32E	508.0	E	313162,167511	Site Address: Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, South Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: LEV001 Operator: Levis Len Surrendered Date: - Waste Management licence No: 30362 Annual Tonnage: 0.0	Issue Date: 14/6/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Levis Vehicle Dismantlers Cancelled Date: - Correspondence Address: Len Levis, Sub Unit 1, 19, Atlantic Crescent, Barry Docks, Barry, South Glam, CF63 3RF
33	525.0	E	313200,167713	Site Address: 22, Atlantic Business Park, Barry Docks, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: COM003 Operator: Comerford David John Surrendered Date: - Waste Management licence No: 30354 Annual Tonnage: 2499.0	Issue Date: 29/9/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Atlantic Salvage Company Cancelled Date: - Correspondence Address: 22 Atlantic Business Park, Barry Docks, Barry, Vale Of Glam, CF63 3RF
34F	636.0	SE	313183,167268	Site Address: Unit 14e, Atlantic Trading Estate, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: AND003 Operator: Andrew Brown & Lee Walter Peacock Surrendered Date: - Waste Management licence No: 30372 Annual Tonnage: 2499.0	Issue Date: 26/1/2006 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: A & L Scrap Metal Merchants Cancelled Date: - Correspondence Address: Unit 14e, Atlantic Trading Estate, Barry, Vale Of Glam, CF63 3RF
35F	636.0	SE	313183,167268	Site Address: Unit 14e, Atlantic Trading Estate, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: AND003 Operator: Andrew Brown & Lee Walter Peacock Surrendered Date: - Waste Management licence No: 30372 Annual Tonnage: 2499.0	Issue Date: 26/1/2006 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: A & L Scrap Metal Merchants Cancelled Date: - Correspondence Address: Unit 14e, Atlantic Trading Estate, Barry, Vale Of Glam, CF63 3RF
36F	636.0	SE	313183,167268	Site Address: Unit 14e, Atlantic Trading Estate, Barry, Vale Of Glam, CF63 3RF Type: End of Life Vehicles Size: ← 25000 tonnes Regis Licence Number: AND003 Operator: Andrew Brown & Lee Walter Peacock Surrendered Date: - Waste Management licence No: 30372 Annual Tonnage: 2499.0	Issue Date: 26/1/2006 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: A & L Scrap Metal Merchants Cancelled Date: 0 Correspondence Address: Unit 14e, Atlantic Trading Estate, Barry, Vale Of Glam, CF63 3RF

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GroundSure Environmental Data Report Reference: HMD-188-62960

Not shown	968.0	NE	313398,168308	Site Address: Dow Corning Landfill, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Industrial waste landfills Size: ← 25000 tonnes Regis Licence Number: DOW001 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30043 Annual Tonnage: 18250.0	Issue Date: 9/4/1991 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Ltd Cancelled Date: - Correspondence Address: Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	968.0	NE	313398,168308	Site Address: Dow Corning Landfill, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: - Size: 1 Regis Licence Number: - Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30043 Annual Tonnage: 0.0	Issue Date: - Expiry Date: - Effective Date: - Status: - Modified: - Site Name: Dow Corning Ltd Cancelled Date: - Correspondence Address: , ,
Not shown	968.0	NE	313398,168308	Site Address: Dow Corning Landfill, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Industrial waste landfills Size: ← 25000 tonnes Regis Licence Number: DOW001 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30043 Annual Tonnage: 18250.0	Issue Date: 4/9/1991 0:00:00 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Ltd Cancelled Date: - Correspondence Address: Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	968.0	NE	313398,168308	Site Address: Dow Corning Landfill, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Industrial waste landfills Size: ← 25000 tonnes Regis Licence Number: DOW001 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30043 Annual Tonnage: 18250.0	Issue Date: 9/4/1991 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Ltd Cancelled Date: - Correspondence Address: Beth Voice, Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	1019.0	N	312323,168696	Site Address: Court Road C/ A Site, Court Road, Barry, Vale Of Glam, CF31 3XT Type: Household, Commercial and Industrial transfer stations Size: ← 25000 tonnes Regis Licence Number: EC0002 Operator: Ecovert Ltd Surrendered Date: - Waste Management licence No: 30076 Annual Tonnage: 24999.0	Issue Date: 22/12/1992 Expiry Date: - Effective Date: - Status: Issued Modified: 29/3/1999 Site Name: Court Road Civic Amenity Site Cancelled Date: - Correspondence Address: Stormy West Transfer Station, Stormy Down, Pyle, Bridgend, Vale Of Glam, CF32 0NP
Not shown	1019.0	N	312323,168696	Site Address: Court Road C/ A Site, Court Road, Barry, Vale Of Glam, CF31 3XT Type: - Size: 1 Regis Licence Number: - Operator: Ecovert Ltd Surrendered Date: - Waste Management licence No: 30076 Annual Tonnage: 0.0	Issue Date: - Expiry Date: - Effective Date: - Status: - Modified: - Site Name: Court Road Civic Amenity Site Cancelled Date: - Correspondence Address: , ,
Not shown	1019.0	N	312323,168696	Site Address: Court Road C/ A Site, Court Road, Barry, Vale Of Glam, CF31 3XT Type: Household, Commercial and Industrial transfer stations Size: ← 25000 tonnes Regis Licence Number: EC0002 Operator: Ecovert Ltd Surrendered Date: - Waste Management licence No: 30076 Annual Tonnage: 24999.0	Issue Date: 22/12/1992 Expiry Date: - Effective Date: - Status: Issued Modified: 29/3/1999 Site Name: Court Road Civic Amenity Site Cancelled Date: - Correspondence Address: Zac Shell, Stormy West Transfer Station, Stormy Down, Pyle, Bridgend, Vale Of Glam, CF32 0NP
Not shown	1019.0	N	312323,168696	Site Address: Court Road C/ A Site, Court Road, Barry, Vale Of Glam, CF31 3XT Type: Household, Commercial and Industrial transfer stations Size: ← 25000 tonnes Regis Licence Number: EC0002 Operator: Ecovert Ltd Surrendered Date: - Waste Management licence No: 30076 Annual Tonnage: 24999.0	Issue Date: 22/12/1992 Expiry Date: - Effective Date: - Status: Issued Modified: 29/3/1999 Site Name: Court Road Civic Amenity Site Cancelled Date: - Correspondence Address: Lakeside Pavillion, Chaucer Business Park, Watery Lane, Kemsing, Sevenoaks, TN15 6QY

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GroundSure Environmental Data Report Reference: HMD-188-62960

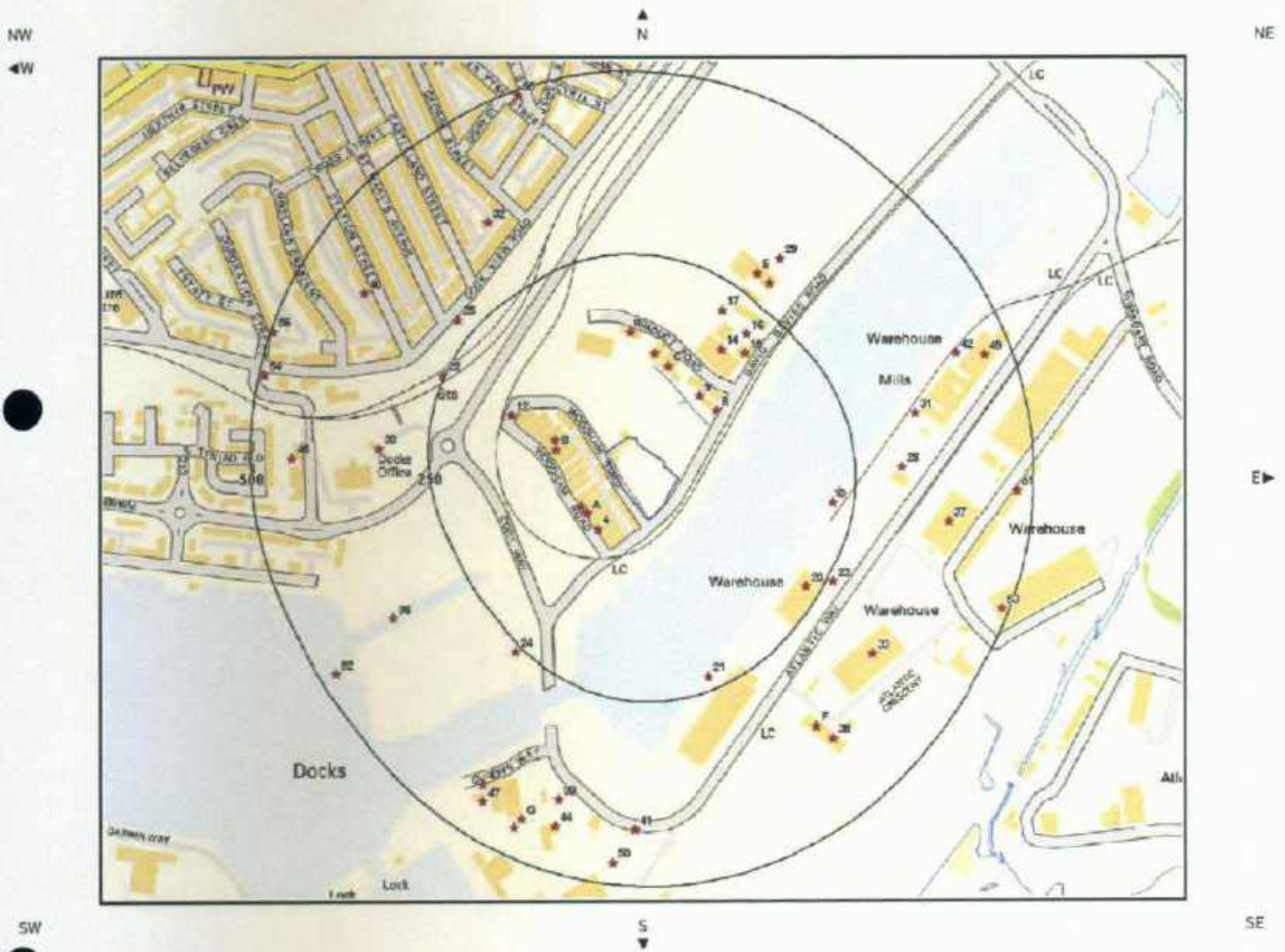
Not shown	1034.0	N	312290,168702	Site Address: Court Road C/ A Site, Court Road, Barry, Vale Of Glam, CF63 1ET Type: Household, Commercial and Industrial transfer stations Size: ← 25000 tonnes Regis Licence Number: ECO002 Operator: Ecovert Ltd Surrendered Date: - Waste Management licence No: 30076 Annual Tonnage: 24999.0	Issue Date: 22/12/1992 Expiry Date: - Effective Date: - Status: Issued Modified: 29/3/1999 Site Name: Court Road Civic Amenity Site Cancelled Date: - Correspondence Address: Lakeside Pavillion, Chaucer Business Park, Watery Lane, Kemsing, Sevenoaks, Kent, TN15 6QY
Not shown	1034.0	N	312290,168702	Site Address: Court Road C/ A Site, Court Road, Barry, Vale Of Glam, CF63 1ET Type: Household, Commercial and Industrial transfer stations Size: ← 25000 tonnes Regis Licence Number: ECO002 Operator: Ecovert Ltd Surrendered Date: - Waste Management licence No: 30076 Annual Tonnage: 24999.0	Issue Date: 22/12/1992 Expiry Date: - Effective Date: - Status: Issued Modified: 29/3/1999 Site Name: Court Road Civic Amenity Site Cancelled Date: 0 Correspondence Address: Lakeside Pavillion, Chaucer Business Park, Watery Lane, Kemsing, Sevenoaks, Kent, TN15 6QY
Not shown	1034.0	N	312290,168702	Site Address: Aberthaw Power Station, Aberthaw, Barry, Vale Of Glam, CF62 4ZW Type: Industrial waste landfills Size: →= 75000 tonnes Regis Licence Number: INND01 Operator: R W E Innogy Plc Surrendered Date: - Waste Management licence No: 30067 Annual Tonnage: 1100200.0	Issue Date: 22/8/1992 Expiry Date: - Effective Date: 14/7/2001 Status: Modified Modified: 17/7/2003 Site Name: Aberthaw Power Station Cancelled Date: - Correspondence Address: Aberthaw Power Station, Aberthaw, Vale Of Glam, CF62 4ZW
Not shown	1050.0	NE	313595,168171	Site Address: Dow Corning Waste Transfer Station, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Material recycling treatment facilities Size: ← 25000 tonnes Regis Licence Number: DOW003 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30376 Annual Tonnage: 4999.0	Issue Date: 29/12/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Waste Transfer Station Cancelled Date: - Correspondence Address: Dow Corning Ltd, Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	1050.0	NE	313595,168171	Site Address: Dow Corning Waste Transfer Station, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Material recycling treatment facilities Size: ← 25000 tonnes Regis Licence Number: DOW003 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30376 Annual Tonnage: 4999.0	Issue Date: 29/12/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Waste Transfer Station Cancelled Date: - Correspondence Address: Dow Corning Ltd, Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	1050.0	NE	313595,168171	Site Address: Dow Corning Waste Transfer Station, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Material recycling treatment facilities Size: ← 25000 tonnes Regis Licence Number: DOW003 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30376 Annual Tonnage: 4999.0	Issue Date: 29/12/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Waste Transfer Station Cancelled Date: 0 Correspondence Address: Dow Corning Ltd, Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	1051.0	NE	313591,168181	Site Address: Dow Corning Ltd, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Material recycling treatment facilities Size: ← 25000 tonnes Regis Licence Number: DOW003 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30376 Annual Tonnage: 4999.0	Issue Date: 29/12/2005 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Waste Transfer Station Cancelled Date: - Correspondence Address: Cardiff Road, Barry, CF63 2YL



GroundSure Environmental Data Report Reference: HMD-188-62960

Not shown	1210.0	NE	313530,168521	Site Address: Dow Corning Landfill, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Industrial waste landfills Size: ← 25000 tonnes Regis Licence Number: DOW001 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30043 Annual Tonnage: 18250.0	Issue Date: 9/4/1991 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Ltd Cancelled Date: - Correspondence Address: Dow Corning Ltd, Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	1210.0	NE	313530,168521	Site Address: Dow Corning Landfill, Cardiff Road, Barry, Vale Of Glam, CF63 2YL Type: Industrial waste landfills Size: ← 25000 tonnes Regis Licence Number: DOW001 Operator: Dow Corning Ltd Surrendered Date: - Waste Management licence No: 30043 Annual Tonnage: 18250.0	Issue Date: 9/4/1991 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Dow Corning Ltd Cancelled Date: 0 Correspondence Address: Dow Corning Ltd, Cardiff Road, Barry, Vale Of Glam, CF63 2YL
Not shown	1430.0	E	314100,167522	Site Address: Sully Hospital Transfer Stn, Hayes Road, Sully, Vale Of Glam, CF64 5YA Type: Clinical waste transfer stations or A20 or A15 Size: ← 25000 tonnes Regis Licence Number: LLA002 Operator: Cardiff & Vale N H S Trust Surrendered Date: 21/12/2004 Waste Management licence No: 30065 Annual Tonnage: 0.0	Issue Date: 1/7/1992 Expiry Date: - Effective Date: - Status: Surrendered Modified: - Site Name: Sully Hospital Transfer Station Cancelled Date: - Correspondence Address: Llandough Hospital, Penlan Road, Penarth, Vale Of Glam, CF64 2XX
Not shown	1430.0	E	314100,167522	Site Address: Sully Hospital Transfer Stn, Hayes Road, Sully, Vale Of Glam, CF64 5YA Type: - Size: 1 Regis Licence Number: - Operator: Cardiff & Vale N H S Trust Surrendered Date: - Waste Management licence No: 30065 Annual Tonnage: 0.0	Issue Date: - Expiry Date: - Effective Date: - Status: - Modified: - Site Name: Sully Hospital Transfer Station Cancelled Date: - Correspondence Address: . .
Not shown	1430.0	E	314100,167522	Site Address: Sully Hospital Transfer Stn, Hayes Road, Sully, Vale Of Glam, CF64 5YA Type: Clinical waste transfer stations or A20 or A15 Size: ← 25000 tonnes Regis Licence Number: LLA002 Operator: Cardiff & Vale N H S Trust Surrendered Date: 21/12/2004 Waste Management licence No: 30065 Annual Tonnage: 1346.0	Issue Date: 1/7/1992 Expiry Date: - Effective Date: - Status: Surrendered Modified: - Site Name: Sully Hospital Transfer Station Cancelled Date: 0 Correspondence Address: Llandough Hospital, Penlan Road, Penarth, Vale Of Glam, CF64 2XX

3. Current Land Use Map



Current Land Use Legend



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-  Site Outline
-  Search Buffers (m)
-  Current Industrial Sites
-  Petrol & Fuel Sites
-  Underground High Pressure Oil & Fuel Pipelines

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3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 500m of the study site:

56

The following records are represented as points on the Current Land Uses map.

ID	Distance	Direction	Company	Address	Activity	Category
1A	60.0	SW	Cars On Gas	4, Woodham Road, Barry, CF63 4JE	Vehicle Repair and Servicing	Repair and Servicing
2A	60.0	SW	German Car Specialists	5, Woodham Road, Barry, CF63 4JE	Vehicle Repair and Servicing	Repair and Servicing
3A	60.0	SW	Welsh Caravan Specialist	5, Woodham Road, Barry, CF63 4JE	Sports and Leisure Equipment Repair	Repair and Servicing
4	62.0	SW	Ross Garage	3, Woodham Road, Barry, CF63 4JE	Vehicle Repair and Servicing	Repair and Servicing
5A	62.0	SW	Gym Systems & Servicing	6-7, Woodham Road, Barry, CF63 4JE	Hobby, Sports and Pastime Products	Consumer Products
6B	69.0	W	Potter	12, Woodham Road, Barry, CF63 4JE	Vehicle Bodybuilders	Industrial Products
7B	72.0	W	Topend Ltd	13, Woodham Road, Barry, CF63 4JE	Vehicle Repair and Servicing	Repair and Servicing
8	101.0	NE	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
9	103.0	NE	Works	-	Unspecified Works Or Factories	Industrial Features
10C	109.0	NE	Works	-	Unspecified Works Or Factories	Industrial Features
11C	119.0	N	Works	-	Unspecified Works Or Factories	Industrial Features
12	142.0	W	Church Motors	19, Woodham Road, Barry, CF63 4JE	Vehicle Repair and Servicing	Repair and Servicing
13	144.0	N	Works	-	Unspecified Works Or Factories	Industrial Features
14	170.0	NE	Vaughan Transport Systems	Dock 2, David Davies Road, Barry, CF63 4AB	Distribution and Haulage	Transport, Storage And Deliver
15	187.0	NE	S & K Haulage Ltd	David Davies Road, Barry, CF63 4AB	Distribution and Haulage	Transport, Storage And Deliver
16	209.0	NE	Depot	-	Container and Storage	Transport, Storage And Deliver
17	213.0	NE	Tank	-	Tanks (Generic)	Industrial Features
18D	220.0	E	Travelling Crane	-	Travelling Cranes and Gantries	Industrial Features
19D	228.0	E	Cranes	-	Travelling Cranes and Gantries	Industrial Features
20	230.0	SE	Warehouse	-	Container and Storage	Transport, Storage And Deliver
21	231.0	S	Travelling Cranes	-	Travelling Cranes and Gantries	Industrial Features
22	252.0	NW	Barry Docks Station	-	Railway Stations, Junctions and Halts	Transport Access Points
23	259.0	SE	Tank	-	Tanks (Generic)	Industrial Features
24	260.0	SW	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
25	276.0	NW	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
26E	283.0	NE	Works	-	Unspecified Works Or Factories	Industrial Features
27E	283.0	NE	Harris Pye Marine Ltd	David Davies Road, Barry, CF63 4AB	Marine Engineers and Services	Engineering Services

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28	315.0	E	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
29	318.0	NE	Depot	-	Container and Storage	Transport, Storage And Deliver
30	320.0	W	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
31	345.0	E	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
32	354.0	NW	Vanguard (Wales) Ltd	Castleland Street, Barry, CF63 4LL	Construction Completion Services	Construction Services
33	358.0	SE	Warehouse	-	Container and Storage	Transport, Storage And Deliver
34F	367.0	SE	D B Engineering Services	Unit 1, Atlantic Crescent, Barry, CF63 3RG	Industrial Engineers	Engineering Services
35F	367.0	SE	Leisure Solutions	Unit 1, Atlantic Crescent, Barry, CF63 3RG	Hobby, Sports and Pastime Products	Consumer Products
36	369.0	SW	Graving Dock (Disused)	-	Marine Equipment Including Boats and Ships	Industrial Products
37	386.0	E	Warehouse	-	Container and Storage	Transport, Storage And Deliver
38	394.0	SE	Tank	-	Tanks (Generic)	Industrial Features
39	402.0	S	Depot	-	Container and Storage	Transport, Storage And Deliver
40	403.0	NW	Mr Fix I.T.	19, Station Street, Barry, CF63 4LW	Electrical Equipment Repair and Servicing	Electrical Equipment Repair and Servicing
41	423.0	S	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
42	426.0	NE	Silo	-	Hoppers and Silos	Hoppers and Silos
43	430.0	SW	Tank	-	Tanks (Generic)	Industrial Features
44	438.0	S	Groupe Samat UK Ltd	Atlantic Way, Barry, CF63 3RA	Distribution and Haulage	Transport, Storage And Deliver
45	441.0	W	Caterite Ltd	3, Subway Road, Barry, CF63 4OT	Food and Beverage Industry Machinery	Industrial Products
46G	446.0	SW	Tank	-	Tanks (Generic)	Industrial Features
47	449.0	SW	Tank	-	Tanks (Generic)	Industrial Features
48G	460.0	SW	Depot	-	Container and Storage	Transport, Storage And Deliver
49	463.0	E	Warehouse	-	Container and Storage	Transport, Storage And Deliver
50	471.0	S	Depot	-	Container and Storage	Transport, Storage And Deliver
51	476.0	E	Warehouse	-	Container and Storage	Transport, Storage And Deliver
52	478.0	SW	Jetty (Disused)	-	Moorings and Unloading Facilities	Water
53	489.0	E	Sos Salvage Car Breakers	Unit 19, Atlantic Crescent, Barry Docks, Barry, South Glamorgan, CF63 3RF	Vehicle Breakers	Recycling Services
54	492.0	W	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
55	493.0	N	Electricity Sub Station	-	Electrical Features	Infrastructure and facilities
56	496.0	W	A P C	35, Coronation Street, Barry, CF63 4JW	Construction Completion Services	Construction Services

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3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

3.3 Underground High Pressure Oil and Gas Pipelines

Records of underground pipelines within 500m of the study site: 0

Database searched and no data found.

4. Geology

4.1 Artificial Ground and Made Ground

The database has been searched on site, this includes a 50m buffer.

Distance (m)	Direction	LEX Code	Description	Rock Type
0.0	On Site	MGR-MGRD	MADE GROUND (UNDIVIDED)	MADE GROUND (COMPOSITION UNSPECIFIED)

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

4.2 Superficial Ground and Drift Geology

The database has been searched on site, this includes a 50m buffer.

Distance (m)	Direction	Lex Code	Description	Rock Type
0.0	On Site	TFD-CLSS	Tidal Flat Deposits	Clay, Silt And Sand

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

4.3 Bedrock and Solid Geology

The database has been searched on site, this includes a 50m buffer.

Distance (m)	Direction	LEX Code	Description	Rock Type
0.0	On Site	MMG-MDST	Mercia Mudstone Group	Mudstone

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

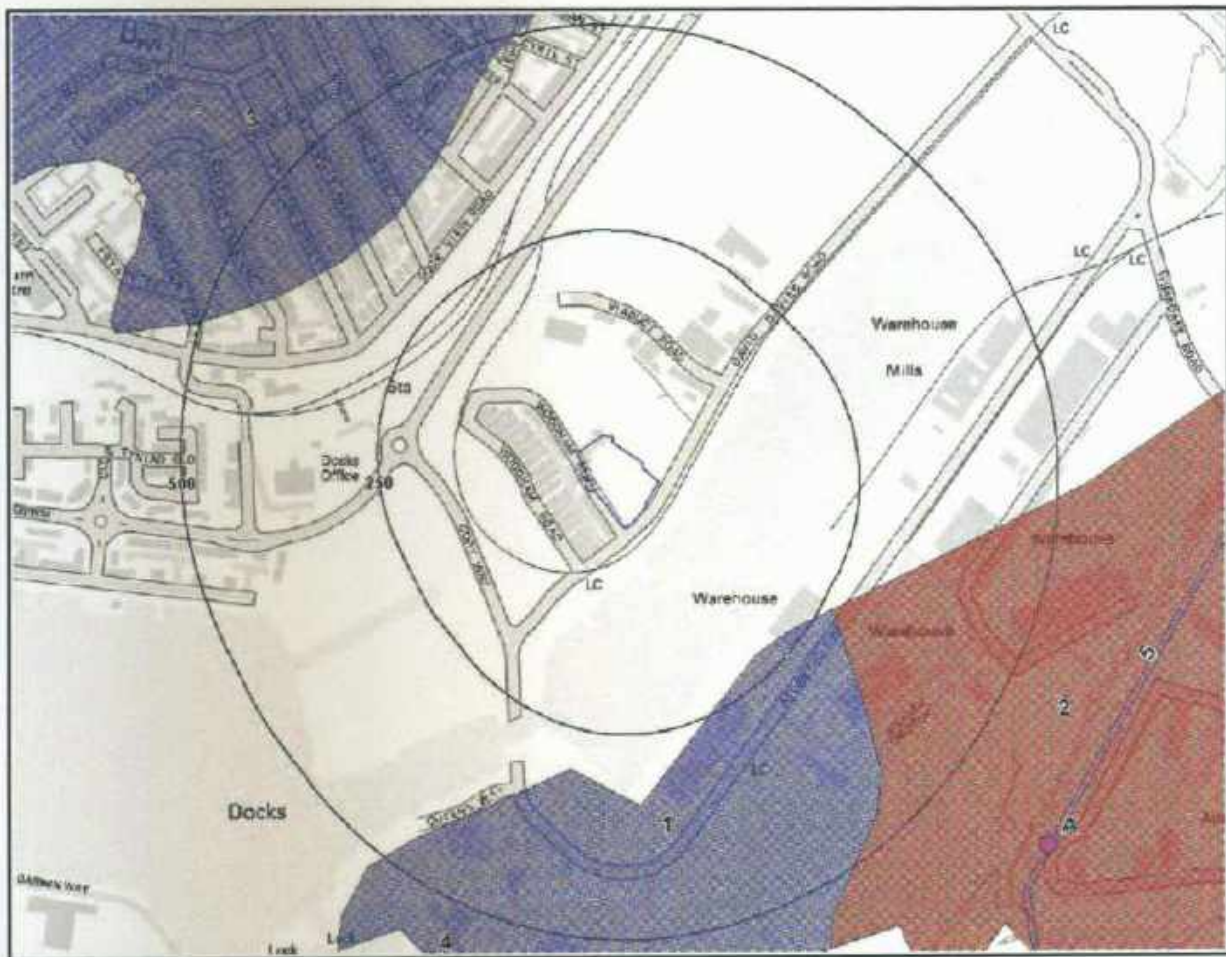
For more detailed geological and ground stability data please refer to the "GroundSure Geology and Ground Stability Report". Available from our website.

5. Hydrogeology and Hydrology: - Aquifer and Abstraction Licence Map

NW

N

NE



SW

E

SW

S

SE

Hydrogeology and Hydrology Legend


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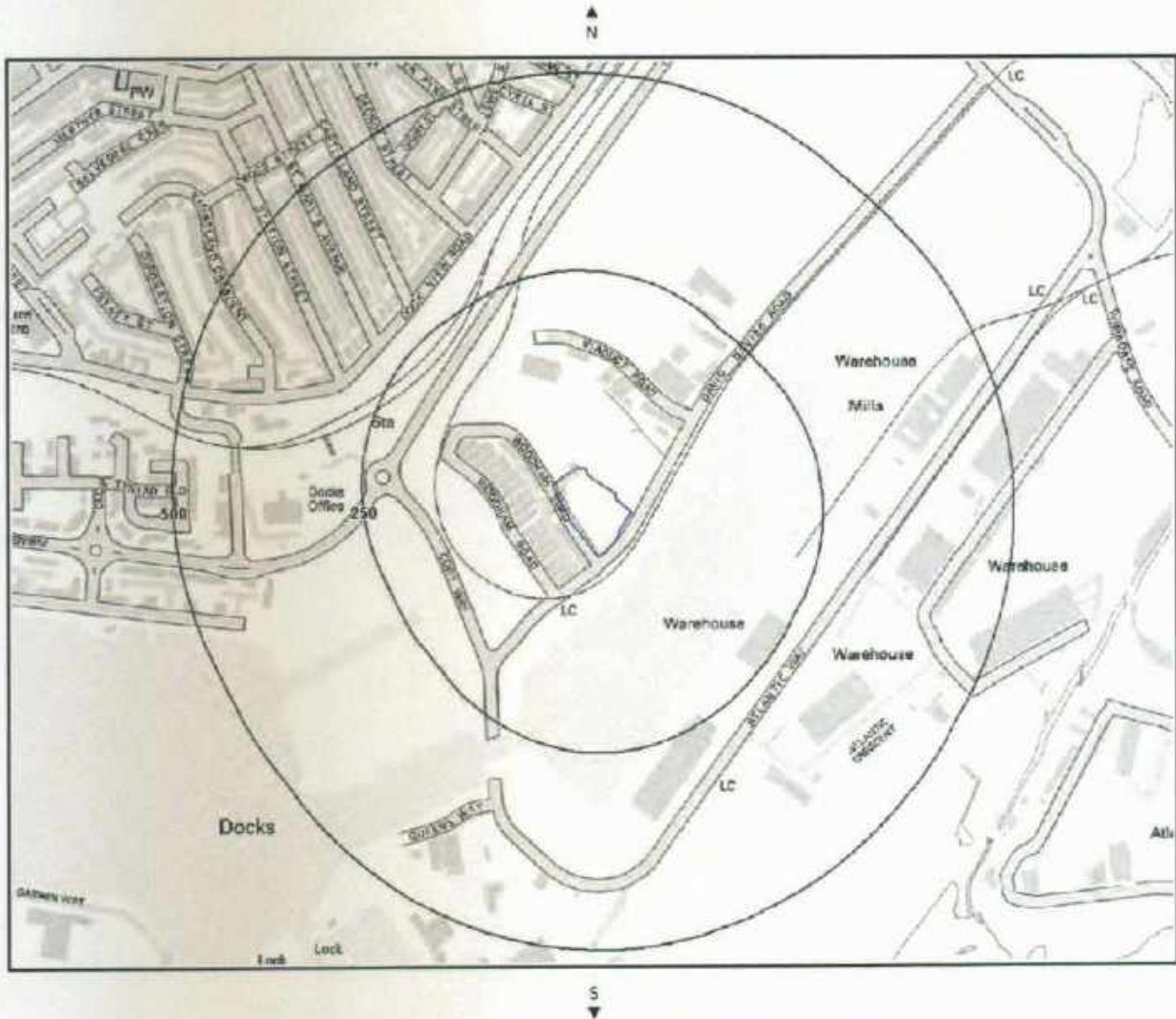
5b. Hydrogeology and Hydrology: - SPZ and Potable Water Abstraction Map

NW

NE

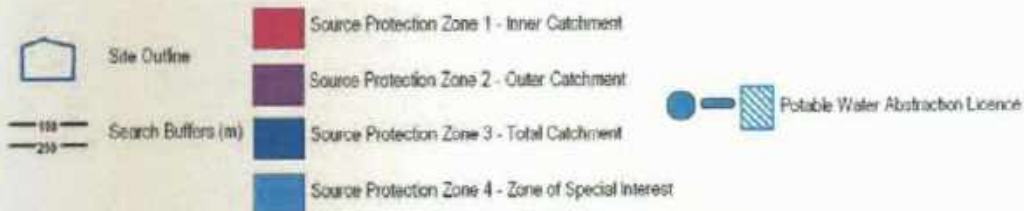
W

E



SE

Hydrogeology and Hydrology Legend


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5. Hydrogeology and Hydrology

5.1 Groundwater Vulnerability and Soil Classification

Records of aquifer and soil classification within 200m of the study site: No
Database searched and no data found.

5.2 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer and Abstraction Licence Map:

ID	Distance	Direction	NGR	Details	
Not shown	1413.0	SW	311620,166620	Licence No: 21/58/31/0031 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Eaw Groundwater Point: Borehole At Barry Island Pleasure Park Data Type: Point	Original Application No: Original Start Date: 31-May-2002 Expiry Date: 31-May-2002 Issue No: 1 Version Start Date: 31-May-2002 Version End Date: 31-May-2002
Not shown	1413.0	SW	311620,166620	Licence No: 21/58/31/0031 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Eaw Groundwater Point: Borehole At Barry Island Pleasure Park Data Type: Point	Original Application No: Original Start Date: 31-May-2002 Expiry Date: 31-Mar-2018 Issue No: 1 Version Start Date: 31-May-2002 Version End Date: 01-Jan-1900
Not shown	1413.0	SW	311620,166620	Licence No: 21/58/31/0030 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Eaw Groundwater Point: Borehole At Barry Island Pleasure Park Data Type: Point	Original Application No: Original Start Date: 21-Mar-1997 Expiry Date: Issue No: 100 Version Start Date: 21-Mar-1997 Version End Date:
Not shown	1413.0	SW	311620,166620	Licence No: 21/58/31/0031 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Eaw Groundwater Point: Borehole At Barry Island Pleasure Park Data Type: Point	Original Application No: Original Start Date: 31-May-2002 Expiry Date: 31-Mar-2018 Issue No: 1 Version Start Date: 21-May-2004 Version End Date:
Not shown	1413.0	SW	311620,166620	Licence No: 21/58/31/0031 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Eaw Groundwater Point: Borehole At Barry Island Pleasure Park Data Type: Point	Original Application No: Original Start Date: 31-May-2002 Expiry Date: 31-Mar-2018 Issue No: 1 Version Start Date: 21-May-2004 Version End Date:
Not shown	1413.0	SW	311620,166620	Licence No: 21/58/31/0031 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Eaw Groundwater Point: Borehole At Barry Island Pleasure Park Data Type: Point	Original Application No: Original Start Date: 31-May-2002 Expiry Date: 31-Mar-2018 Issue No: 1 Version Start Date: 21-May-2004 Version End Date:

5.3 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 1000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer and Abstraction Licence Map:

ID	Distance	Direction	NGR	Details
----	----------	-----------	-----	---------



GroundSure Environmental Data Report Reference: HMD-188-62960

12A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Mineral Washing Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 101 Version Start Date: 25-Jun-2001 Version End Date:
13A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Make-Up or Top Up Water Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 100 Version Start Date: 24-Apr-1996 Version End Date:
14A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Make-Up or Top Up Water Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: 30-Dec-1899 Issue No: 101 Version Start Date: 25-Jun-2001 Version End Date: 01-Jan-1900
15A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Dust Suppression Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 102 Version Start Date: 01-Oct-2005 Version End Date:
16A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Mineral Washing Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 102 Version Start Date: 01-Oct-2005 Version End Date:
17A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Dust suppression Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: 24-Apr-1996 Issue No: 101 Version Start Date: 24-Apr-1996 Version End Date: 24-Apr-1996
18A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Make-Up Or Top Up Water Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 102 Version Start Date: 01-Oct-2005 Version End Date:
19A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Mineral Washing Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: 24-Apr-1996 Issue No: 101 Version Start Date: 24-Apr-1996 Version End Date: 24-Apr-1996
20A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Dust suppression Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 100 Version Start Date: 24-Apr-1996 Version End Date:
21A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Make-Up or Top Up Water Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 101 Version Start Date: 25-Jun-2001 Version End Date:
22A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Mineral Washing Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 100 Version Start Date: 24-Apr-1996 Version End Date:
23A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Dust suppression Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: Issue No: 101 Version Start Date: 25-Jun-2001 Version End Date:

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GroundSure Environmental Data Report Reference: HMD-188-62960

24A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Make-Up or Top Up Water Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: 24-Apr-1996 Issue No: 101 Version Start Date: 24-Apr-1996 Version End Date: 24-Apr-1996
25A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Mineral Washing Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: 30-Dec-1899 Issue No: 101 Version Start Date: 25-Jun-2001 Version End Date: 01-Jan-1900
26A	651.0	SE	313164,167218	Licence No: 21/58/11/0011 Details: Dust suppression Direct Source: Eaw Tidalwater Point: Cadoxton River At Barry Data Type: Point	Application No: Original Start Date: 24-Apr-1996 Expiry Date: 30-Dec-1899 Issue No: 101 Version Start Date: 25-Jun-2001 Version End Date: 01-Jan-1900

5.4 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? **No**
Database searched and no data found.

5.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? **No**
Database searched and no data found.

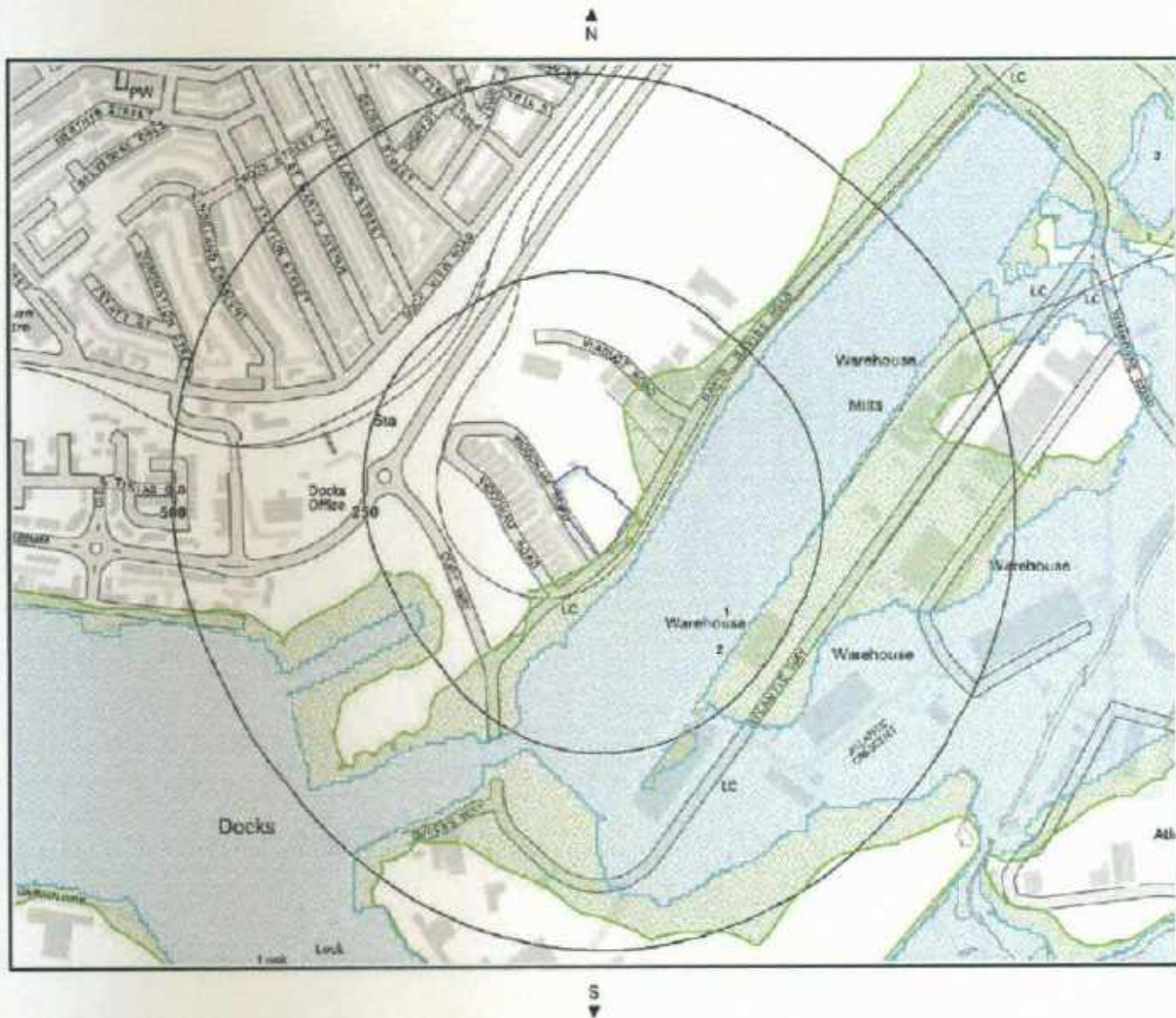
5.6 River Quality

Is there any Environment Agency information on river quality within 500m of the study site? **No**
Database searched and no data found.

5.7 Main Rivers

Are there any Main Rivers within 500m of the study site? **No**
Database searched and no data found.

6. Surface Water Flood Map



Flood Legend



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6. Flooding

6.1 Zone 2 Flooding

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain? **Yes**

Guidance: More detailed information may be available from the Environment Agency through their floodline (0845 988 1188) or by ordering an Environment Agency Flood Report from the local Environment Agency Office.

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance	Direction	Update
1	0.0	SE	07-Feb-2008

6.2 Zone 3 Flooding

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 3 floodplain? **Yes**

Guidance: More detailed information may be available from the Environment Agency through their floodline (0845 988 1188) or by ordering an Environment Agency Flood Report from the local Environment Agency Office.

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance	Direction	Update
2	32.0	E	07-Feb-2008

6.3 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? **No**

Guidance: More detailed information may be available from the Environment Agency through their floodline (0845 988 1188) or by ordering an Environment Agency Flood Report from the local Environment Agency Office.

6.4 Areas used for Storage Areas

Are there any areas used for Flood Storage within 250m of the study site? **No**

Guidance: More detailed information may be available from the Environment Agency through their floodline (0845 988 1188) or by ordering an Environment Agency Flood Report from the local Environment Agency Office.

6.5. Groundwater Flooding Susceptibility Areas

Are there any British Geological Survey groundwater flooding susceptibility flood areas within 50m of the centre of the study site? **Yes**



What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

High

6.6 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result?

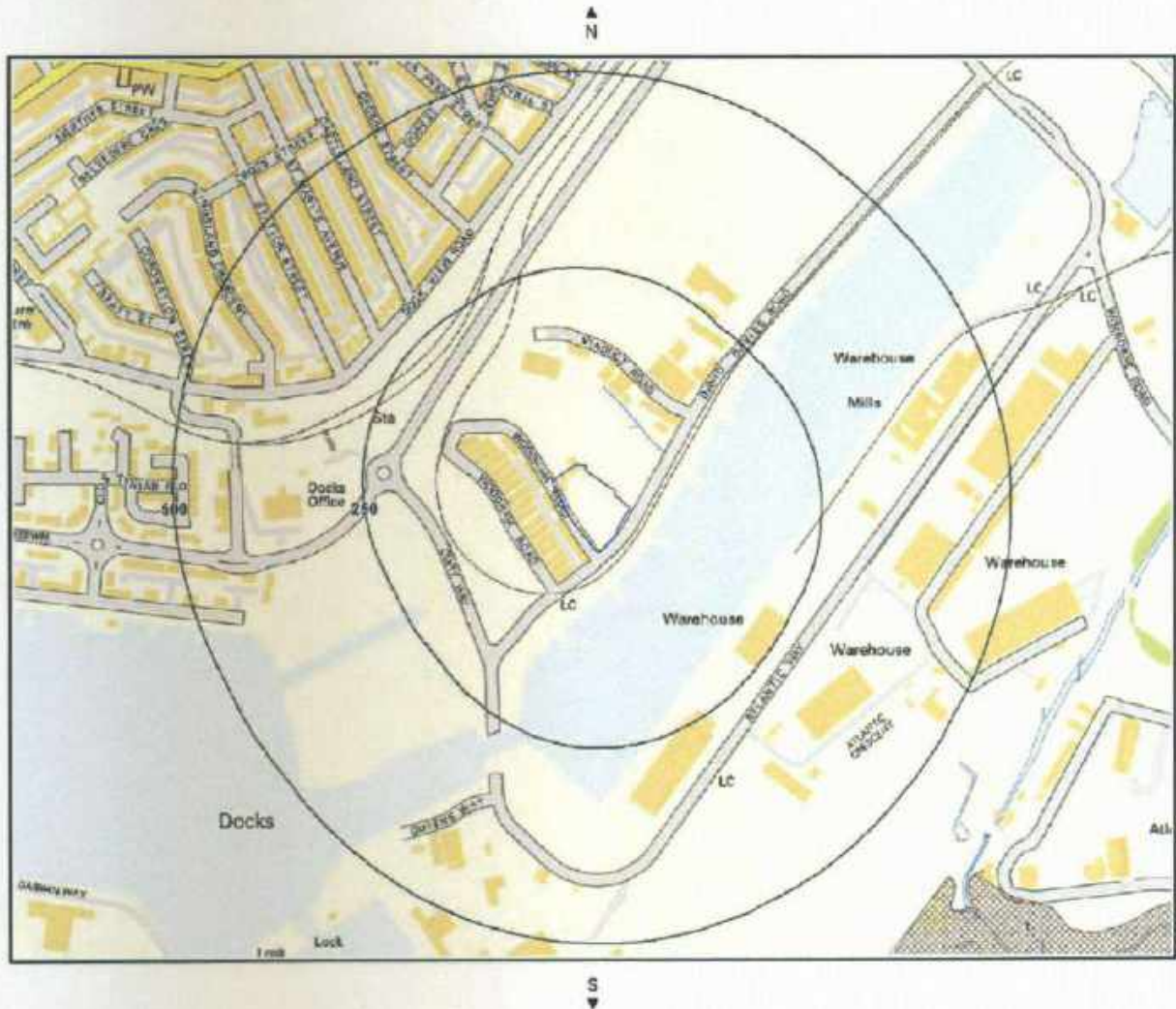
Moderate

Notes:

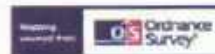
Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a fivefold scale - Low, Moderately Low, Moderate, Moderately High and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

7. Ecological Designated Sites Map



Ecological Designated Sites Legend



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	Site Outline		SAC		SSSI		NHR		World Heritage Sites
	100		250		SPA		Ramcar		LNR

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7 Ecological Designated Sites

Presence of sites of ecological value within 1000m of the study site? Yes

Records of Sites of Special Scientific Interest (SSSI) within 1000m of the study site: 1

The following Sites of Special Scientific Interest (SSSI) records provided by English Nature/Countryside Council for Wales are represented as polygons on the Ecological Designated Sites Map:

ID	Distance	Direction	SSSI Name	Data Source
1	616.0	SE	HAYES POINT TO BENDRICK ROCK	Countryside Council For Wales

Records of National Nature Reserves (NNR) within 1000m of the study site: 0

Database searched and no data found.

Records of Special Areas of Conservation (SAC) within 1000m of the study site: 0

Database searched and no data found.

Records of Special Protection Areas (SPA) within 1000m of the study site: 0

Database searched and no data found.

Records of Ramsar sites within 1000m of the study site: 0

Database searched and no data found.

Records of Local Nature Reserves (LNR) within 1000m of the study site: 0

Database searched and no data found.

Records of World Heritage Sites within 1000m of the study site: 0

Database searched and no data found.

8. Natural Hazards Findings

8.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information, please obtain a GroundSure Geology and Ground Stability Report. Available from our website. The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site? **Very Low**

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? **Very Low**

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? **Null - Negligible**

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? **Very Low**

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? **Null - Negligible**

8.1.6 Running Sand

What is the maximum Running Sand* hazard rating identified on the study site? **Very Low**



9. Mining

9.1 Coal Mining

Are there any coal mining areas within 75m of the study site?

No

Database searched and no data found.

9.2 Shallow Mining

What is the hazard of subsidence relating to shallow mining onsite? (this includes a 150m buffer)

Negligible

10. Contacts

GroundSure Helpline

Telephone: 01273 819700
mapsandinfo@groundsure.com



British Geological Survey (England & Wales)

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143. Fax: 0115 936 3136. www.bgs.ac.uk
BGS Geological Hazards Reports and general geological enquiries



Environment Agency

South East
Rivers house / Plas Yr Afon - St. Mellons Business Park, Forttran
Road, St. Mellons, Cardiff, CF3 0LT Tel: (01222) 770088
EA Wales Tel: (02920) 770 088



The Coal Authority

200 Lichfield Lane, Mansfield, Notts NG18 4RG
Tel: 0845 762 6848. DX 716176 Mansfield 5
www.coal-authority.co.uk
Coal mining reports and related enquiries



Ordnance Survey

Romsey Road
Southampton SO16 4GU
Tel: 08456 050505



Local Authority

Vale of Glamorgan County Borough Council Tel:

Get Mapping PLC

Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW
Tel: 01252 845444



Acknowledgements

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Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, English Nature who retain the Copyright and Intellectual Property Rights for the data.

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This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.



Appendix 17 Geology and Ground Stability Report



GroundSure

Oaktree Environmental
Unit 5 Oasis Park, Road 1,
Winsford Industrial Estate, Winsford,
CW7 3PP

GroundSure Reference: HMD-188-62961
Your Reference: Barry
Report Date: Mar 6, 2008
Report Delivery Method: Email - pdf

GroundSure Geology & Ground Stability Report

Address: WOODHAM ROAD, DOCKS, BARRY, CF62

Dear Sir/Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure Geology & Ground Stability Report** as requested.

If you need any further assistance, please do not hesitate to contact our maps and data helpline on 01273 819700 or email maps&data@groundsure.com quoting the above GroundSure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
GroundSure Geology & Ground Stability Report

GroundSure Geology & Ground Stability Report

Address: WOODHAM ROAD, DOCKS, BARRY, CF62

Date: Mar 6, 2008

GroundSure Reference: HMD-188-62961

Your Reference: Barry



Aerial Photograph of Study Site

NW

N

NE



W

E

SW

S

SE

Site Name: WOODHAM ROAD, DOCKS, BARRY, CF62
Grid Reference: 312620,167670

Aerial photography supplied by Getmapping PLC.
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If you would like any further assistance regarding this report then please contact
GroundSure on (T) 01273 819700, (F) 01273 377902, email: maps&data@groundsure.com

Overview of Findings

The GroundSure Geology and Ground Stability Report provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary
1. Geology	
Description	
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site? *	Yes
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	Yes
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground /Drift Geology present beneath the study site? *	Yes
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	Yes
1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
1.3.2 Are there any records relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.3.4 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a radon Affected Area, as less than 1% of properties are above the Action Level
1.3.5 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site

Source:Scale 1:50,000 BGS Sheet No:263

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Geology & Ground Stability Report Reference: HMD-188-62961

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	3	9	22	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	0	0	5	0	9
2.3 Current Ground Workings	0	0	1	2	1

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	0	4	11	10	23
3.2 Coal Mining	0	0	0	0	0
3.3 Shallow Mining*	1	-	-	-	-
3.4 Non - Coal Mining Cavities	0	0	0	0	0
3.5 Natural Cavities	0	0	0	0	0
3.6 Brine Extraction	0	0	0	0	0
3.7 Gypsum Extraction	0	0	0	0	0
3.8 Tin Mining	0	0	0	0	0
3.9 Clay Mining	0	0	0	0	0

*This includes an automatically generated 150m buffer zone around the site

4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Very Low	-	-	-	-
4.2 Landslides	Very Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Negligible	-	-	-	-
4.4 Compressible Deposits	Very Low	-	-	-	-
4.5 Collapsible Deposits	Negligible	-	-	-	-
4.6 Running Sand	Very Low	-	-	-	-

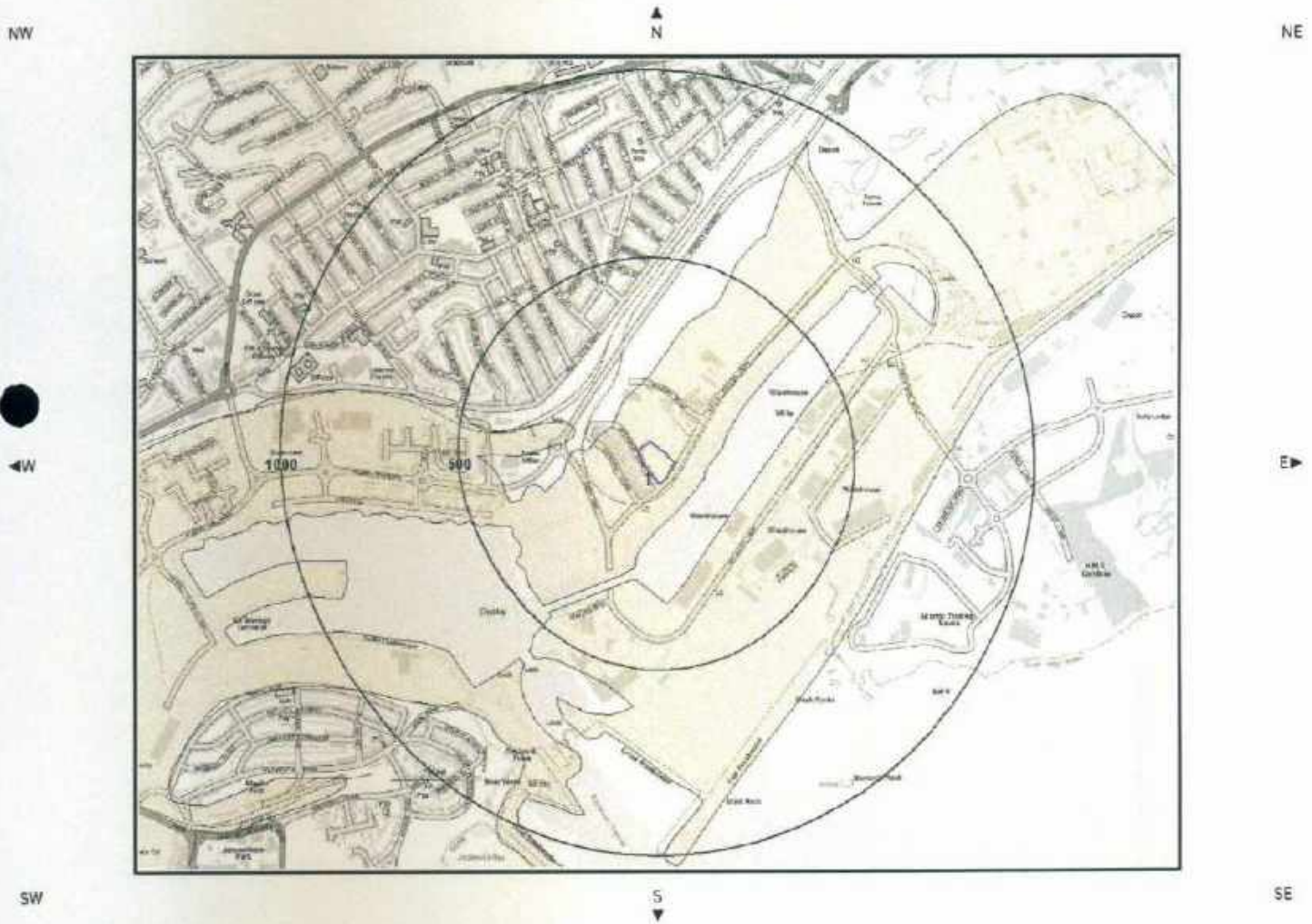
* This includes an automatically generated 50m buffer zone around the site




5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	0	0	3	-	-

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1.1 Artificial Ground Map


Artificial Ground Legend

-  Site Outline
-  50
-  250 Search Buffers



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Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

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1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:263

1.1.1 Artificial/Made Ground

Are there any records of Artificial/Made Ground within 500m of the study site boundary: **Yes**

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	MGR-MGRD	MADE GROUND (UNDIVIDED)	MADE GROUND (COMPOSITION UNSPECIFIED)

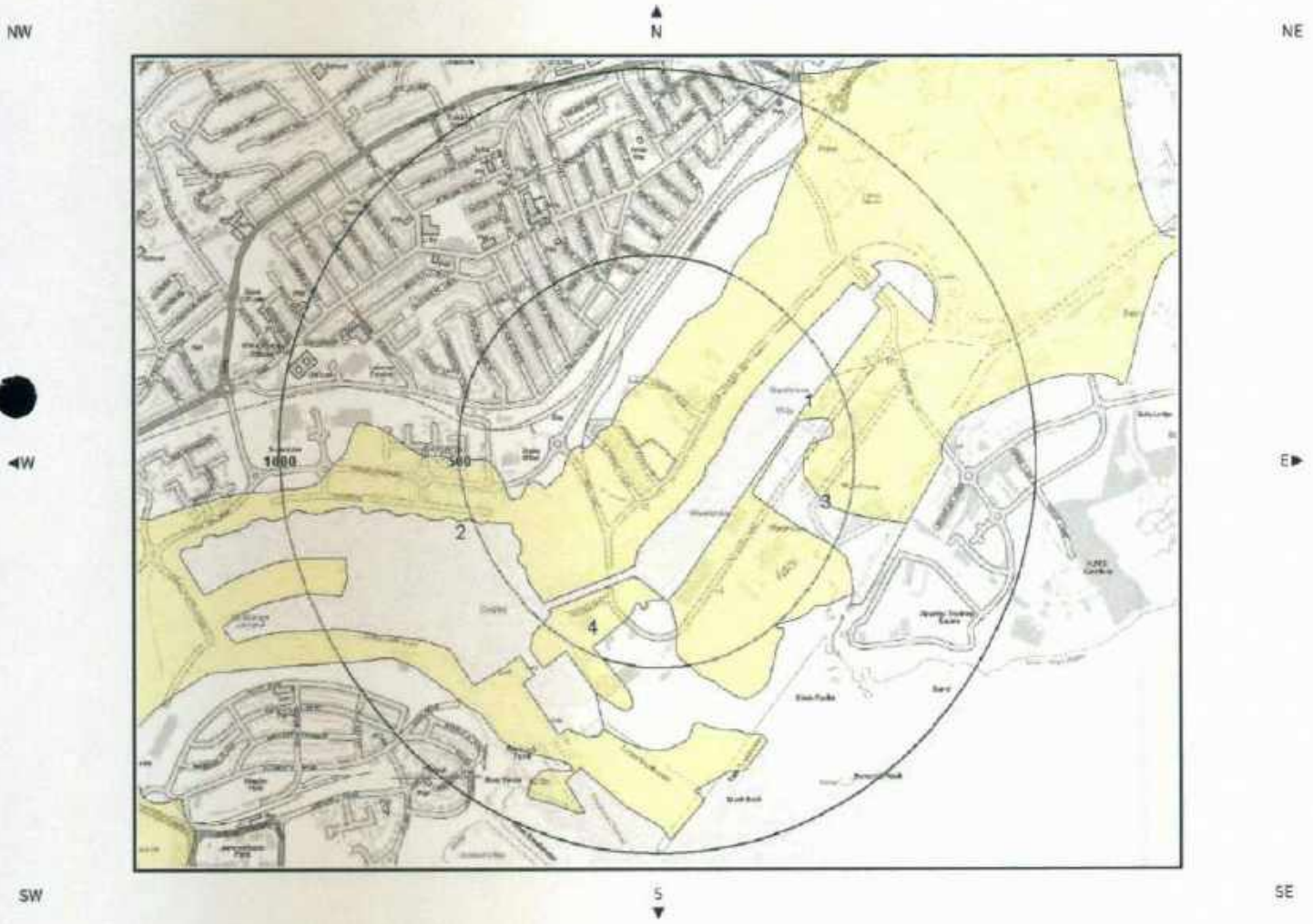
1.1.2 Permeability of Artificial Ground




Are there any records relating to permeability of artificial ground within the study site* boundary: **Yes**

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	Very Low

* This includes an automatically generated 50m buffer zone around the site.

1.2 Superficial Deposits and Landslips Map


Superficial and Landslips Legend

-  Site Outline
-  50
-  250 Search Buffers


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1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/Drift Geology

Are there any records of Superficial Deposits/Drift Geology within 500m of the study site boundary: **Yes**

ID	Distance (m)	Direction	Lex Code	Description	Rock Description
1	0.0	On Site	TFD-CLSS	Tidal Flat Deposits	Clay, Silt And Sand
2	81.0	SE	SUPNM-UNKN	Superficial Deposits Not Mapped [for Digital Map Use Only]	Unknown Lithology
3	233.0	SE	BSA-SAND	Blown Sand	Sand
4	267.0	S	TFD-CLSS	Tidal Flat Deposits	Clay, Silt And Sand

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site* boundary: **Yes**

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Moderate	Very Low

1.2.3 Landslip

Database searched and no data found.

Are there any records of Landslip within 500m of the study site boundary? **No**

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

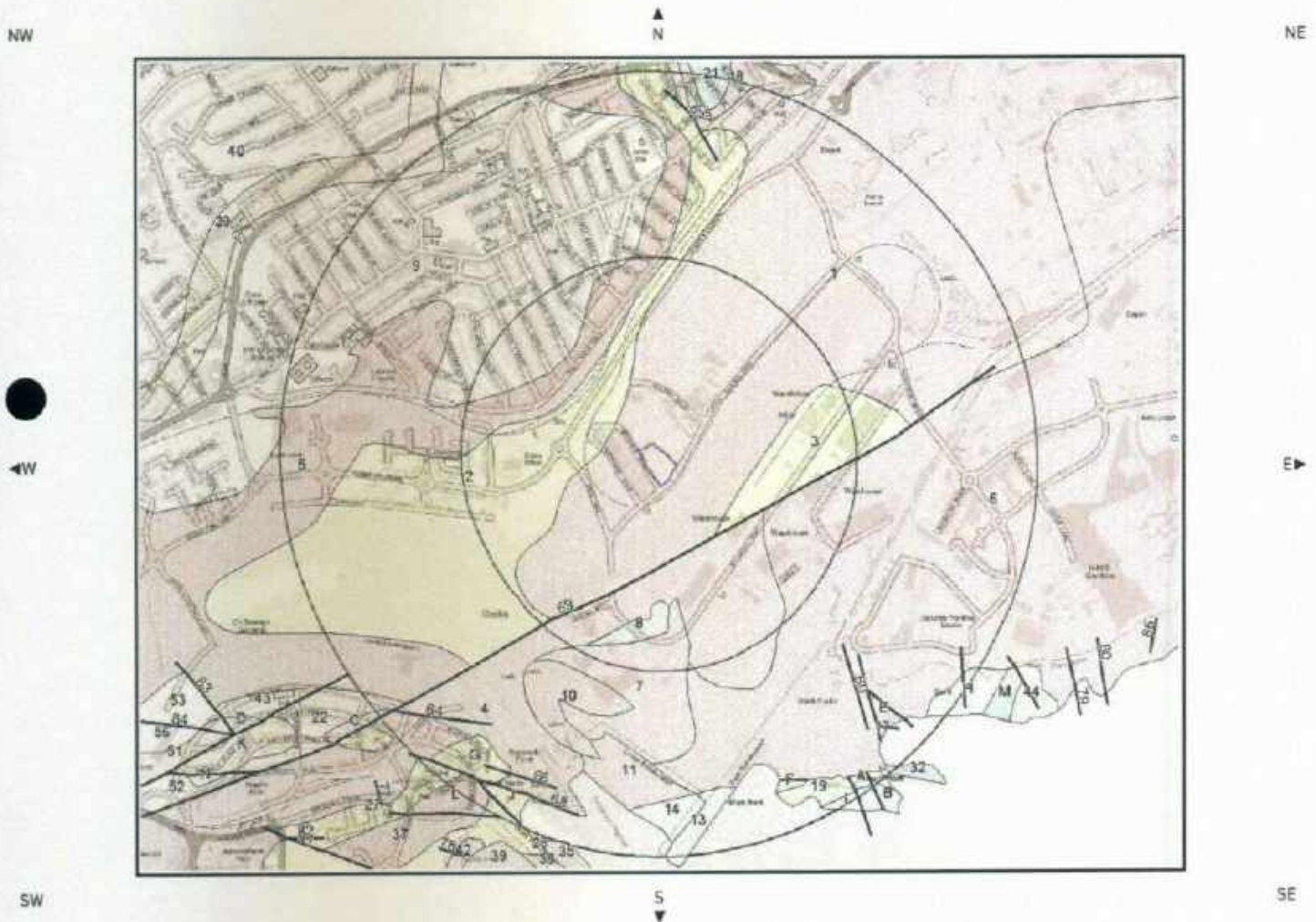
1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary: **No**




Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.

1.3 Bedrock and Faults Map


Bedrock & Faults Deposits Legend

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-  Site Outline
-  50 Search Buffers
-  250 Search Buffers

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

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1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:263

1.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian / Scythian
2	93.0	NW	BAN-MDST	Blue Anchor Formation - Mudstone	Rhaetian / Norian
3	182.0	SE	BAN-MDST	Blue Anchor Formation - Mudstone	Rhaetian / Norian
4	189.0	SE	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian / Scythian
5	245.0	NW	PNG-MDLM	Penarth Group - Mudstone And Limestone, Interbedded	Rhaetian
6	269.0	SE	MMMF-CONG	Mercia Mudstone Group (marginal Facies) - Conglomerate	Triassic
7	302.0	S	QCG-SCON	Quartz Conglomerate Group (south Wales) - Sandstone And Conglomerate, Interbedded	Famennian
8	305.0	S	AVO-LSMD	Avon Group - Limestone And Mudstone, Interbedded	Courseyan
9	327.0	NW	STM-LSMD	St Mary's Well Bay Member - Limestone And Mudstone, Interbedded	Hettangian / Rhaetian

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary: **Yes**

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Low	Low

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? **Yes**

ID	Distance (m)	Direction	Category Description	Feature Description
59	190.0	SE	FAULT	Normal fault, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3.4 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

* This includes an automatically generated 50m buffer zone around the site.

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Geology & Ground Stability Report Reference: HMD-188-62961

The property is not in a radon Affected Area, as less than 1% of properties are above the Action Level

1.3.5 Radon Protection

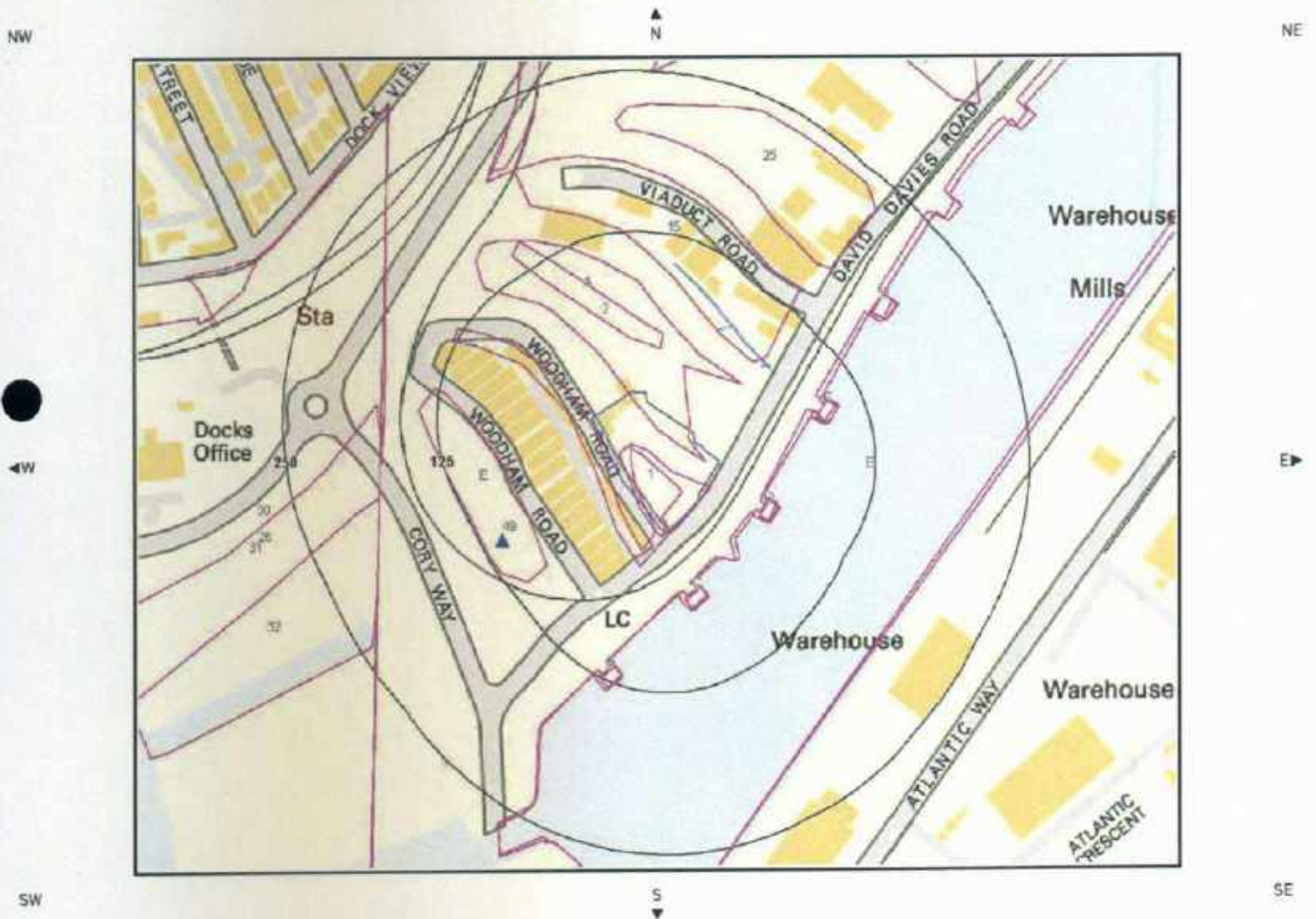
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?



No radon protective measures are necessary




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If you would like any further assistance regarding this report then please contact
GroundSure on (T) 01273 819700, (F) 01273 377902, email: maps&data@groundsure.com

2 Ground Workings Map


Ground Workings Legend

-  Site Outline
-  Search Buffers (m)

-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings



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2 Ground Workings

2.1 Historical Surface Ground Working Features derived from the Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? **Yes**

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance [m]	Direction	NGR	Use	Date
1	0.0	On Site	312621,167639	Unspecified Pit	1947
2	0.0	On Site	312588,167749	Unspecified Pit	1973
3	0.0	On Site	312574,167673	Unspecified Pit	1973
4A	37.0	N	312570,167793	Unspecified Ground Workings	1921
5A	37.0	N	312570,167793	Unspecified Ground Workings	1915
6A	37.0	N	312570,167793	Unspecified Ground Workings	1898
7B	38.0	SE	312815,167738	Dock	1898
8B	40.0	SE	312868,167729	Dock	1915
9C	49.0	SE	312658,167554	Coal Tips	1915
10D	49.0	SE	312717,167622	Coal Tips	1915
11C	50.0	SE	312656,167552	Coal Tips	1921
12C	50.0	SE	312656,167552	Coal Tips	1947
13D	51.0	SE	312716,167620	Coal Tips	1921
14D	51.0	SE	312716,167620	Coal Tips	1947
15	74.0	NE	312626,167820	Unspecified Pit	1973
16E	80.0	SW	312485,167644	Unspecified Heap	1973
17E	80.0	SW	312485,167644	Unspecified Heap	1991
18E	80.0	SW	312485,167644	Unspecified Heap	1982
19F	85.0	NE	312764,167700	Coal Tips	1915
20F	87.0	NE	312762,167701	Coal Tips	1921
21F	87.0	NE	312762,167701	Coal Tips	1947
22G	112.0	SW	312588,167494	Coal Tips	1915
23G	112.0	S	312587,167490	Coal Tips	1921
24G	112.0	S	312587,167490	Coal Tips	1947
25	165.0	NE	312748,167877	Unspecified Pit	1973
26	167.0	W	311610,167338	Docks	1915
27H	168.0	NE	312810,167783	Coal Tips	1921
28H	168.0	NE	312810,167783	Coal Tips	1947
29H	168.0	NE	312809,167782	Coal Tips	1915
30	169.0	W	311732,167331	Dock	1921
31	171.0	W	312285,167590	Graving Dock	1921
32	182.0	W	312300,167534	Graving Dock	1921
33I	249.0	N	312804,168020	Unspecified Ground Workings	1973
34I	249.0	N	312804,168020	Unspecified Ground Workings	1982

2.2 Historical Underground Workings Features derived from the Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? **Yes**

The following Historical Underground Working Features are provided by GroundSure:

ID	Distance [m]	Direction	NGR	Use	Date
35J	197.0	NW	312516,167957	Tunnel	1982

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Geology & Ground Stability Report Reference: HMD-188-62961

36J	197.0	NW	312516,167957	Tunnel	1991
37J	197.0	NW	312516,167957	Tunnel	1973
38J	197.0	NW	312516,167957	Tunnel	1947
39J	202.0	NW	312514,167960	Tunnel	1898
Not shown	932.0	SW	312007,166813	Tunnel	1921
Not shown	933.0	SW	312016,166814	Tunnel	1898
Not shown	933.0	SW	312016,166814	Tunnel	1938
Not shown	933.0	SW	312016,166814	Tunnel	1936
Not shown	933.0	SW	312016,166814	Tunnel	1915
Not shown	962.0	SW	311980,166815	Tunnel	1982
Not shown	962.0	SW	311980,166815	Tunnel	1991
Not shown	962.0	SW	311980,166815	Tunnel	1973
Not shown	962.0	SW	311980,166815	Tunnel	1947

2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

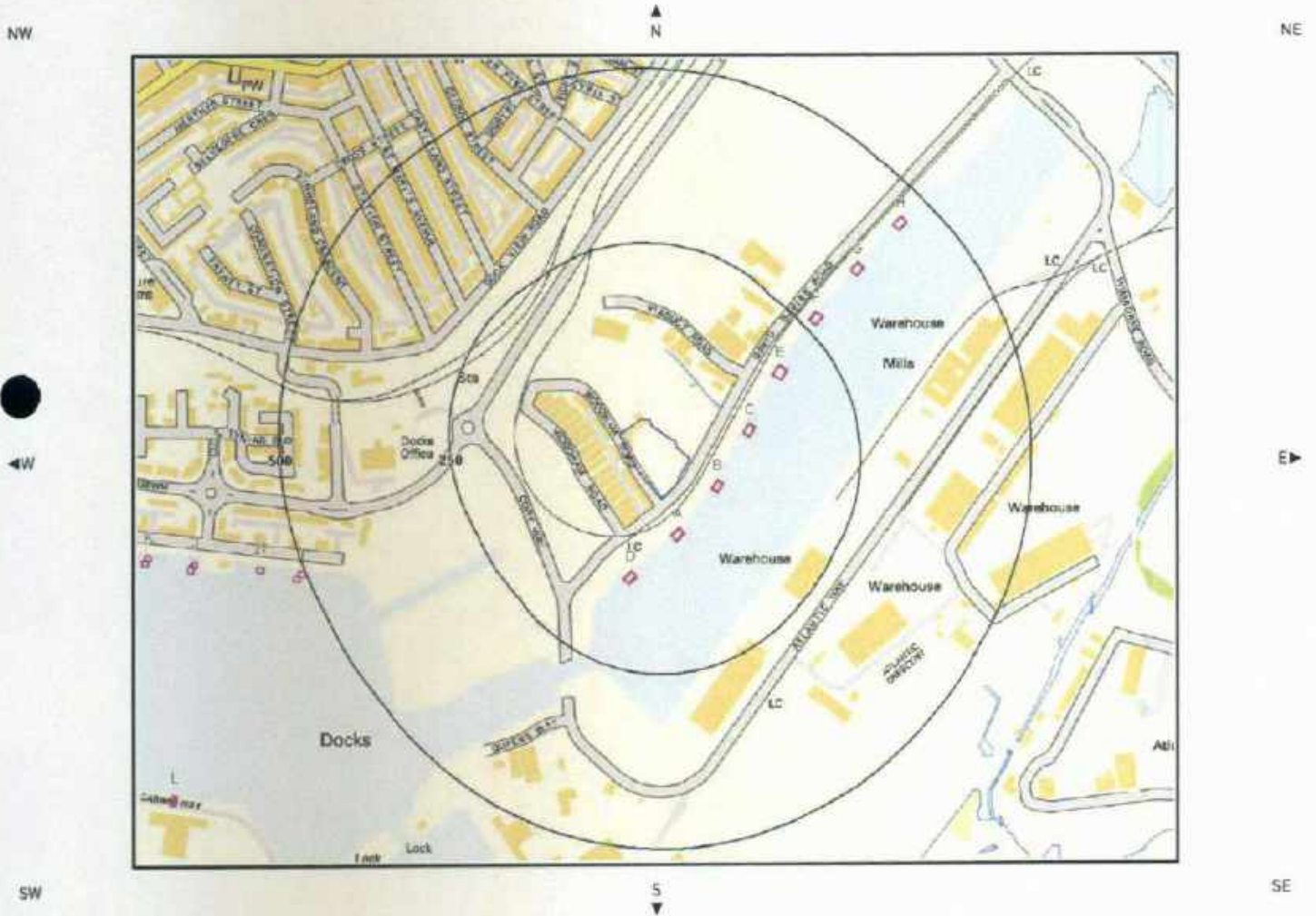
The following Current Ground Workings information is provided by British Geological Society:



ID	Distance (m)	Direction	NGR	Use	Date Updated
49	109.0	SW	312500.0,167600.0	Secondary	16-Jul-2007
Not shown	326.0	S	312750.0,167300.0	Marine Sand & Gravel	06-Sep-2007
Not shown	326.0	S	312750.0,167300.0	Marine Sand & Gravel	21-Sep-2007
Not shown	847.0	SW	312250.0,166850.0	Marine Sand & Gravel	06-Sep-2007

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3 Mining, Extraction & Natural Cavities Map


Mining, Extraction & Natural Cavities Legend

-  Site Outline
-  Search Buffers (m)

-  Historical Mining
-  Non-Coal Mining Cavities
-  Natural Cavities



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3 Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from GroundSure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary?

Yes

The following Historical Mining information is provided by Groundsure :

ID	Distance [m]	Direction	NGR	Details	Date
1A	49.0	SE	312658,167554	Coal Tips	1915
2B	49.0	SE	312717,167622	Coal Tips	1915
3A	50.0	SE	312656,167552	Coal Tips	1921
4A	50.0	SE	312656,167552	Coal Tips	1947
5B	51.0	SE	312716,167620	Coal Tips	1921
6B	51.0	SE	312716,167620	Coal Tips	1947
7C	85.0	NE	312764,167700	Coal Tips	1915
8C	87.0	NE	312762,167701	Coal Tips	1921
9C	87.0	NE	312762,167701	Coal Tips	1947
10D	112.0	SW	312588,167494	Coal Tips	1915
11D	112.0	S	312587,167490	Coal Tips	1921
12D	112.0	S	312587,167490	Coal Tips	1947
13E	168.0	NE	312810,167783	Coal Tips	1921
14E	168.0	NE	312810,167783	Coal Tips	1947
15E	168.0	NE	312809,167782	Coal Tips	1915
16F	260.0	NE	312862,167859	Coal Tips	1915
17F	262.0	NE	312862,167856	Coal Tips	1947
18F	262.0	NE	312862,167856	Coal Tips	1921
19G	353.0	NE	312923,167927	Coal Tips	1947
20G	353.0	NE	312923,167927	Coal Tips	1921
21G	354.0	NE	312923,167929	Coal Tips	1915
22H	443.0	NE	312984,167994	Coal Tips	1921
23H	443.0	NE	312984,167994	Coal Tips	1947
24H	444.0	NE	312984,167995	Coal Tips	1915
25I	500.0	SW	312107,167500	Coal Tips	1915
26I	509.0	SW	312099,167493	Coal Tips	1921
27	554.0	W	312046,167506	Coal Tips	1915
28J	644.0	W	311950,167514	Coal Tips	1915
29J	650.0	W	311945,167508	Coal Tips	1921
30K	707.0	W	311882,167524	Coal Tips	1915
31K	713.0	W	311878,167516	Coal Tips	1921
Not shown	796.0	W	311789,167534	Coal Tips	1915
Not shown	802.0	W	311784,167527	Coal Tips	1921
34L	818.0	SW	311920,167180	Coal Tips	1915
35L	823.0	SW	311918,167175	Coal Tips	1921
Not shown	880.0	W	311702,167538	Coal Tips	1915
Not shown	886.0	W	311696,167531	Coal Tips	1921
Not shown	890.0	W	311733,167367	Coal Tips	1915
Not shown	896.0	W	311736,167364	Coal Tips	1921
Not shown	906.0	SW	311806,167198	Coal Tips	1915
Not shown	915.0	SW	311797,167195	Coal Tips	1921
Not shown	945.0	W	311667,167405	Coal Tips	1915
Not shown	951.0	W	311661,167409	Coal Tips	1921
Not shown	960.0	SW	311679,167312	Coal Tips	1915
Not shown	970.0	W	311613,167532	Coal Tips	1915

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Geology & Ground Stability Report Reference: HMD-188-62961

Not shown	974.0	SW	311674,167307	Coal Tips	1921
Not shown	976.0	W	311607,167525	Coal Tips	1921
Not shown	997.0	SW	311696,167213	Coal Tips	1915

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.3 Shallow Mining

This dataset refers to the (largely very old) extraction of mineral deposits by means of near surface underground workings.

What is the maximum hazard rating of subsidence relating to shallow mining within the study site* boundary? Negligible

*This includes an automatically generated 150m buffer zone around the study site boundary

The following Shallow Mining information provided by the British Geological Survey is not represented on Mapping:

Distance (m)	Direction	Hazard Rating	Details
0.0	On Site	Negligible	Where negligible potential is indicated, this means that the rocks underlying the area are not likely to have been mined at shallow depth. However, you should still find out whether or not a Coal Authority mining search is required in the area, for example, to check for deeper mining.

3.4 Non - Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA)/DEFRA mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.5 Natural Cavities

This dataset provides information based on Peter Brett Associates/ DEFRA natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.6 Brine Extraction

This dataset provides information from the Brine compensation board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.7 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

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3.8 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records.

Are there any Tin Mining areas within 1000m of the study site boundary? **No**

Database searched and no data found.

3.9 Clay Mining

This dataset provides information on Kalin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? **No**

Database searched and no data found.

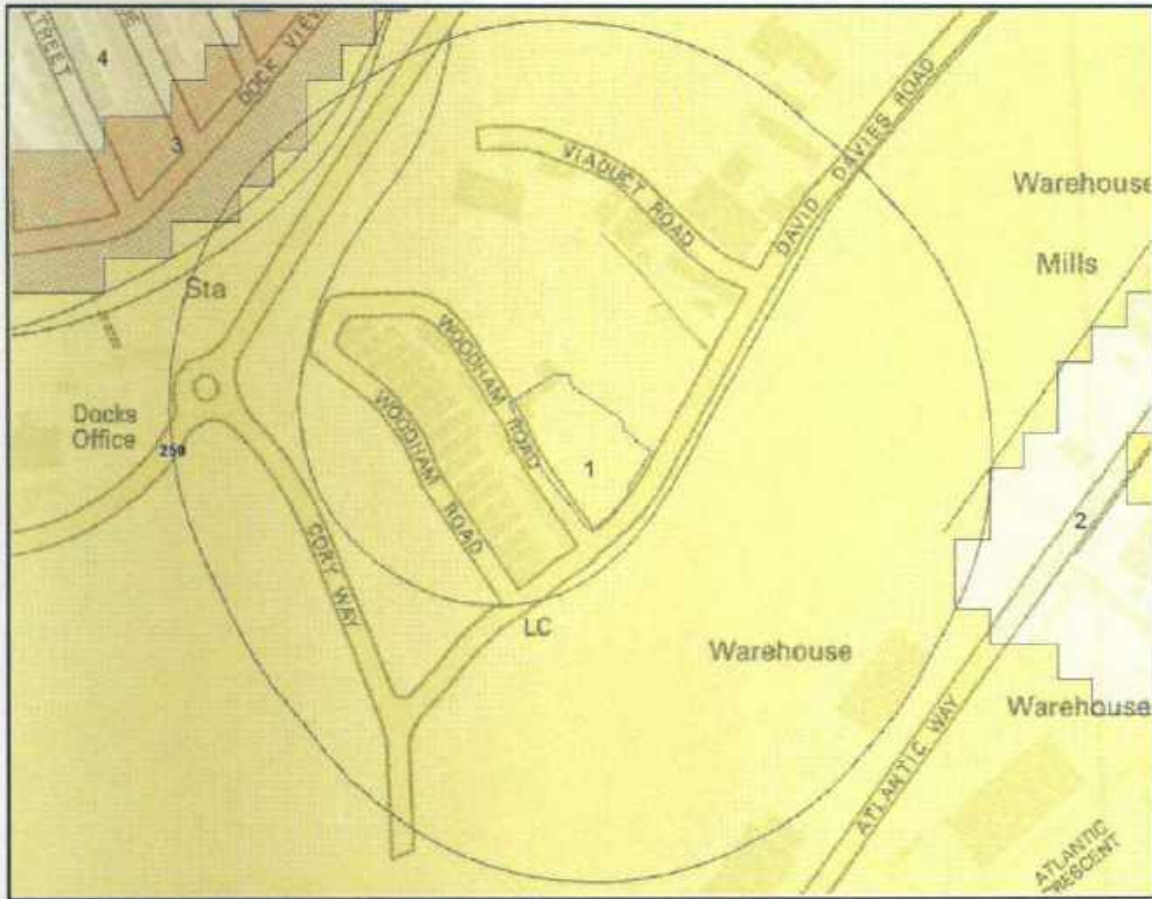
4 Natural Ground Subsidence

4.1 Shrink-Swell Clay Map

NW

N

NE



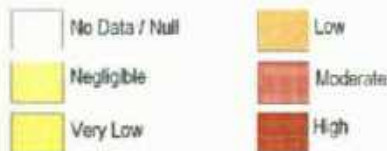
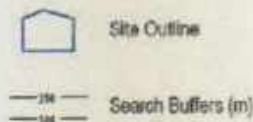
W

E

S

SE

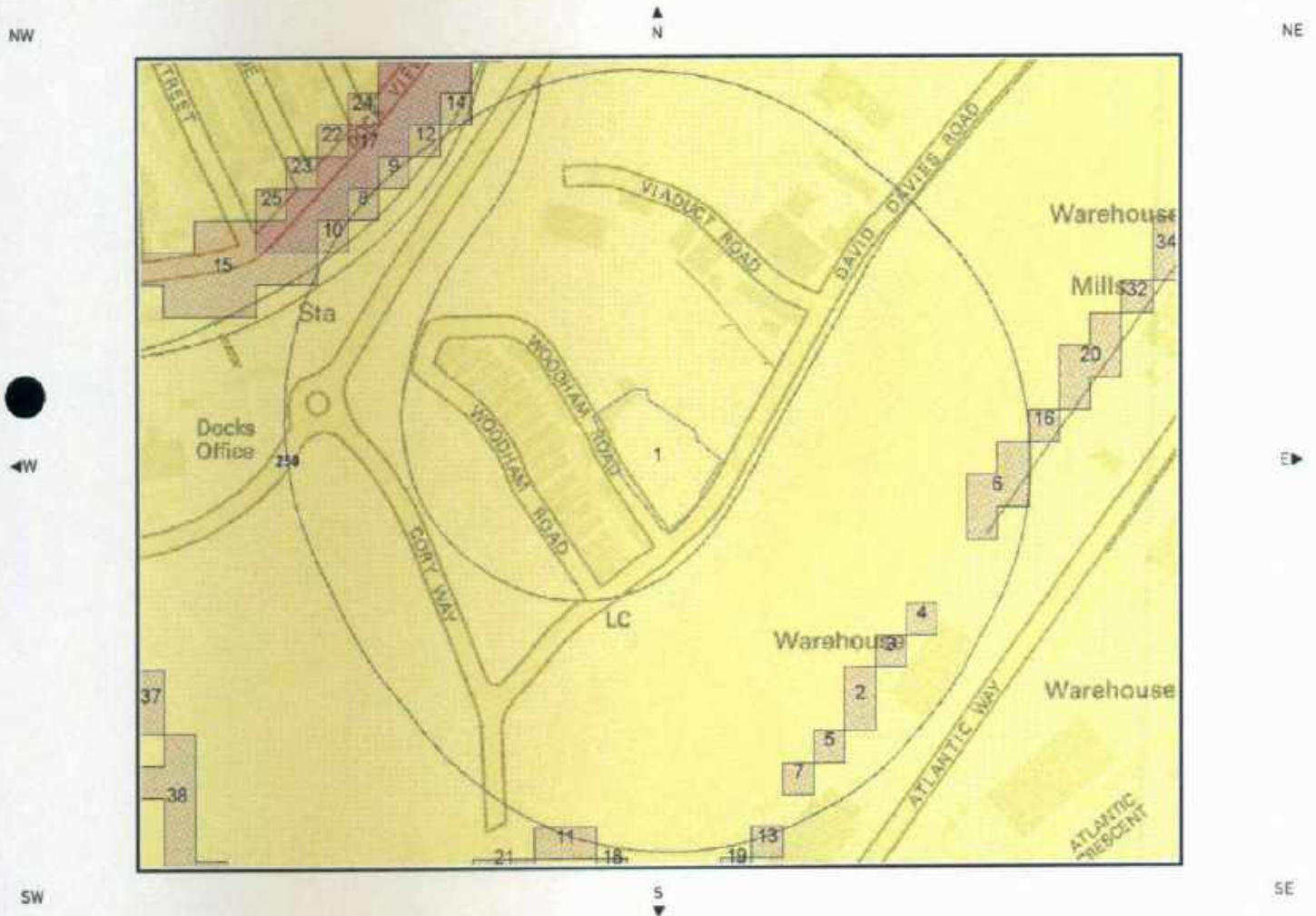
Shrink-Swell Clay Legend

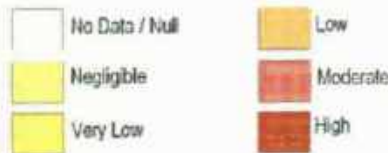
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4.2 Landslides Map

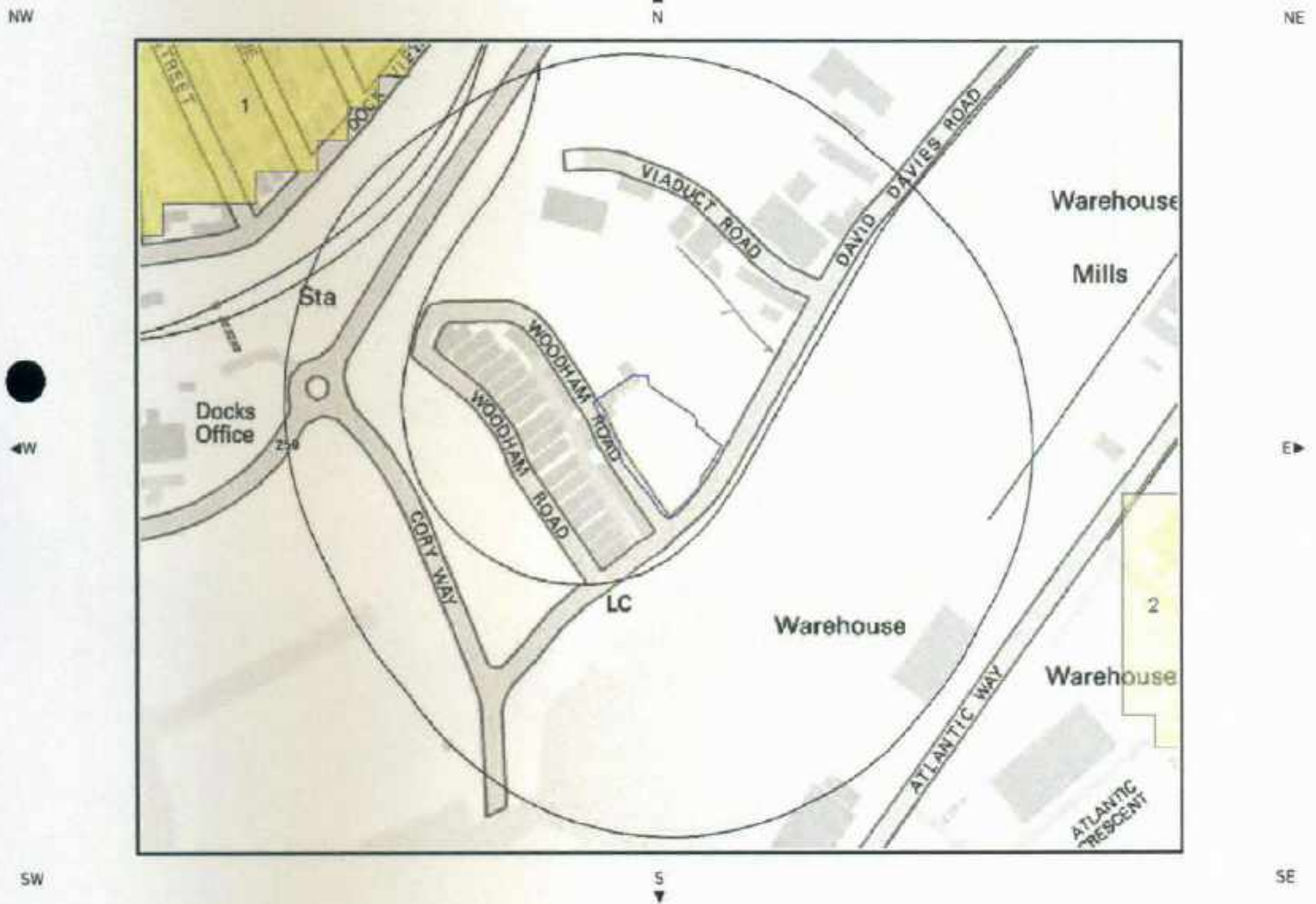

Landslides Legend

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
Brought to you by GroundSure

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4.3 Ground Dissolution Soluble Rocks Map


Ground Dissolution Soluble Rocks Legend

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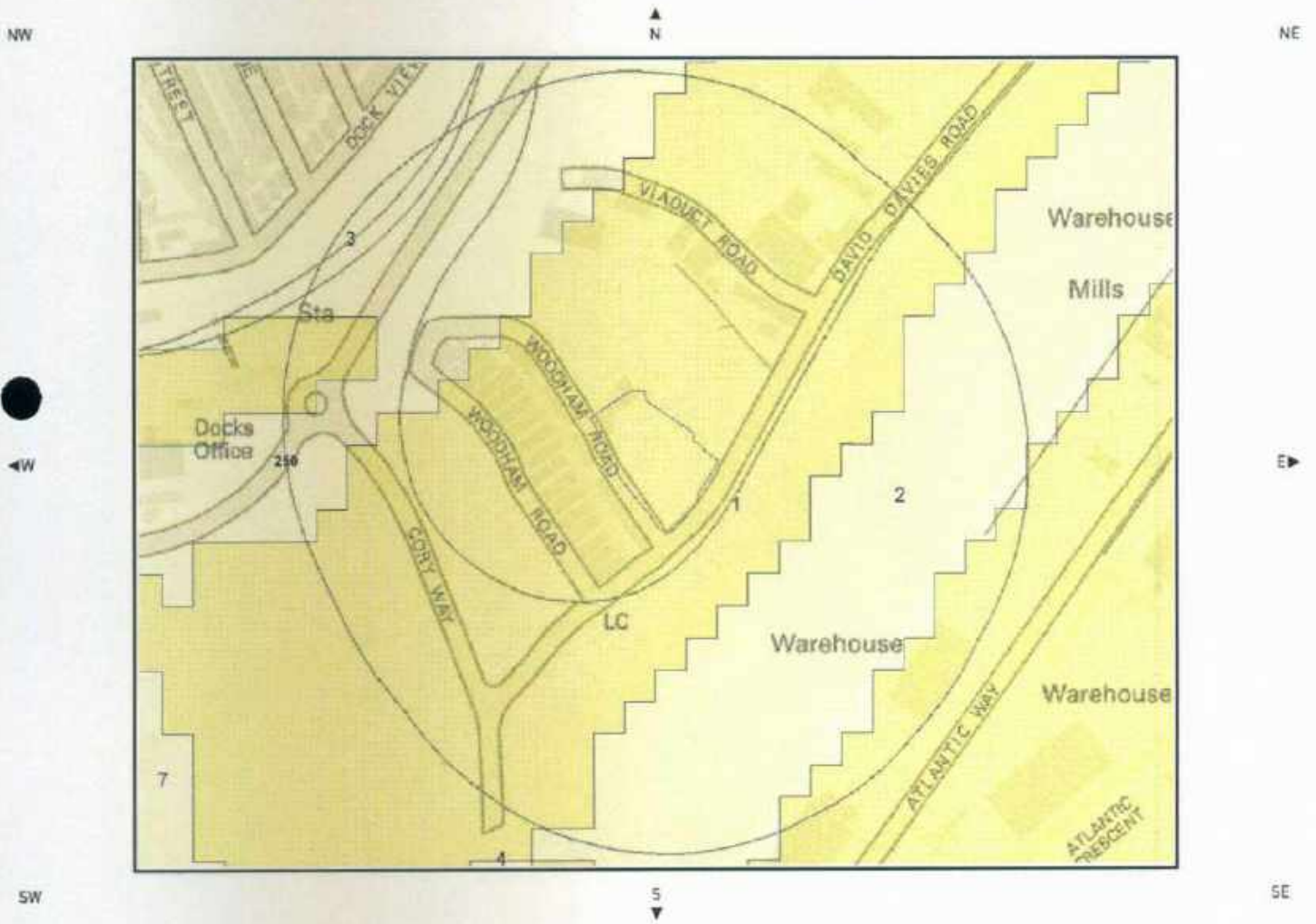
-  Site Outline
-  Search Buffers (m)

-  No Data / Null
-  Negligible
-  Very Low
-  Low
-  Moderate
-  High










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4.4 Compressible Deposits Map


Compressible Deposits Legend

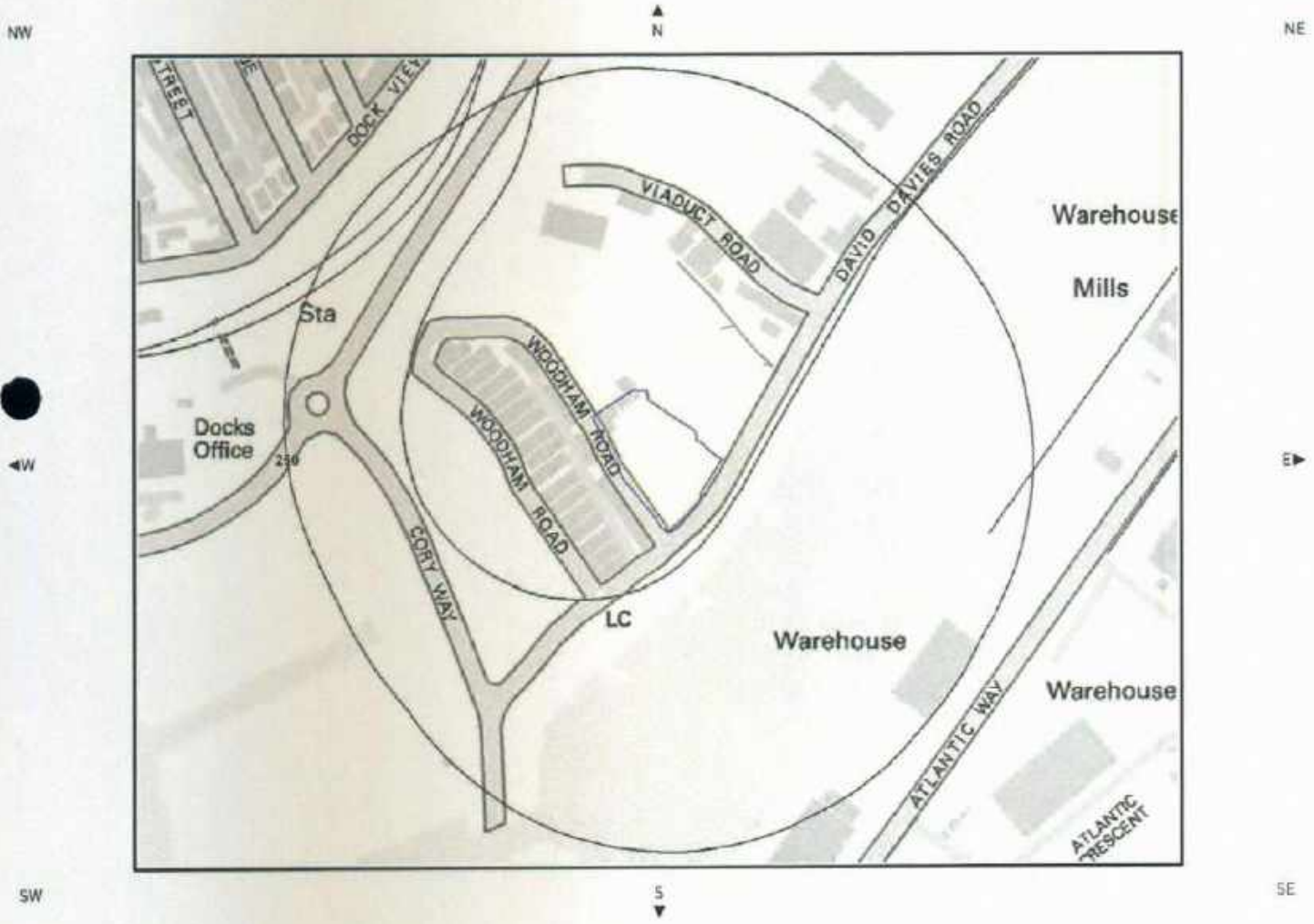
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- | | | |
|---|--|---|
|  Site Outline |  No Data / Null |  Low |
|  Search Buffers (1m) |  Negligible |  Moderate |
|  Search Buffers (3m) |  Very Low |  High |





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4.5 Collapsible Deposits Map


Collapsible Deposits Legend

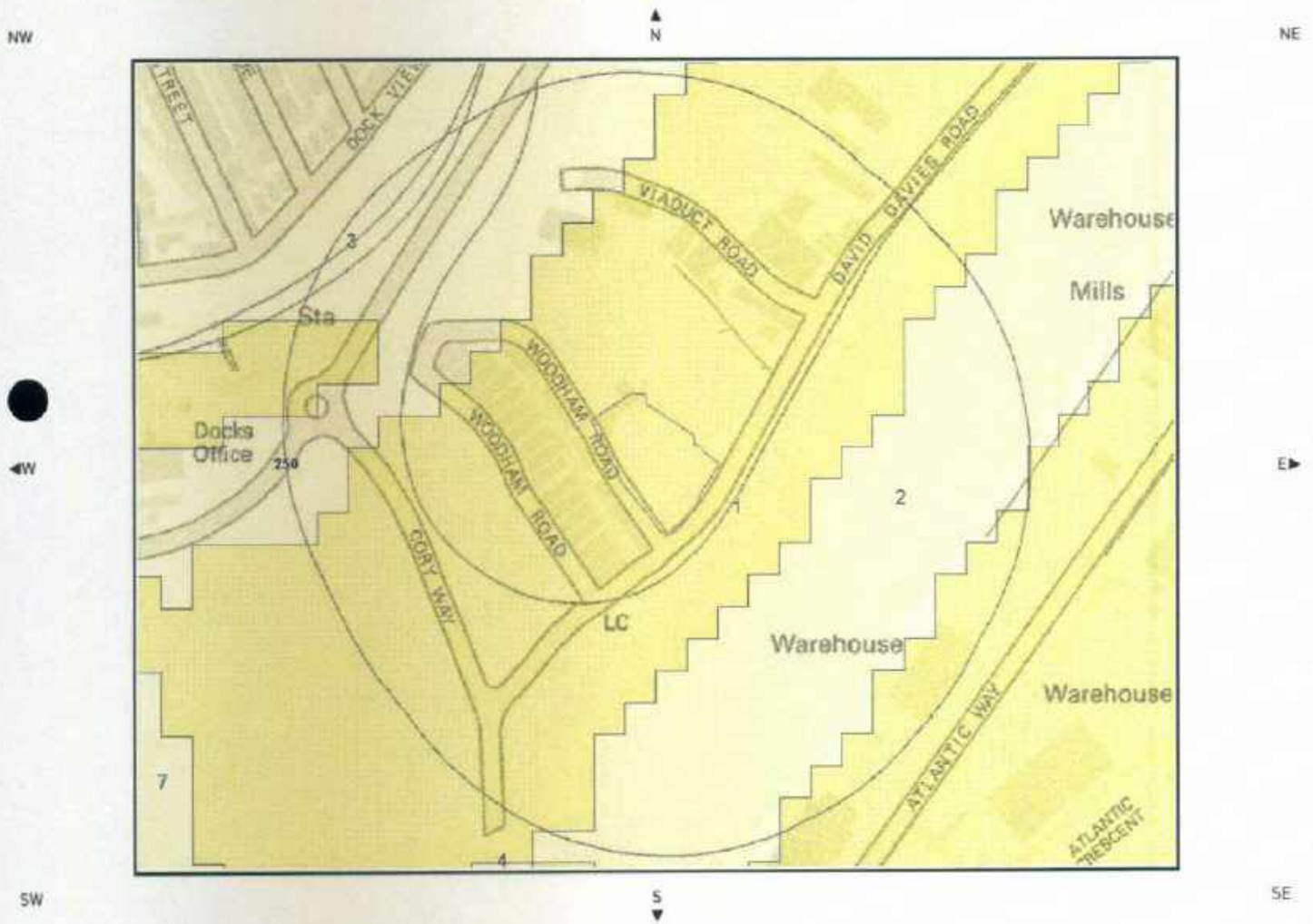
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-  Site Outline
-  Search Buffers (m)
-  No Data / Null
-  Significant

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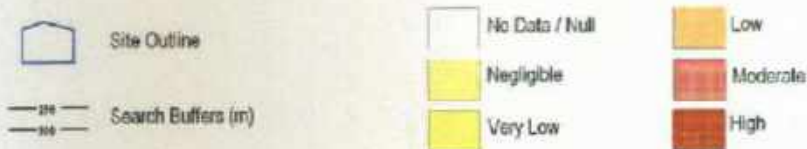
4.6 Running Sand Map



Running Sand Legend



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4. Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS)

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary?

Very Low

*This includes an automatically generated 50m buffer zone around the study site boundary.

4.1 Shrink – Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

4.3 Ground Dissolution of Soluble Rocks

The following Soluble Rocks information provided by the British Geological Survey:

Distance (m)*	Direction	Hazard Rating	Details
0	On site	Null-Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

4.4 Compressible Deposits

The following Compressible Ground information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

4.5 Collapsible Deposits

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Geology & Ground Stability Report Reference: HMD-188-62961

The following **Collapsible Rocks** information is provided by the British Geological Survey:

Distance (m)*	Direction	Hazard Rating	Details
0	On site	Null-Negligible	No Indicators for collapsible deposits identified. No Special actions required to avoid problems due to collapsible deposit.

4.6 Running Sands

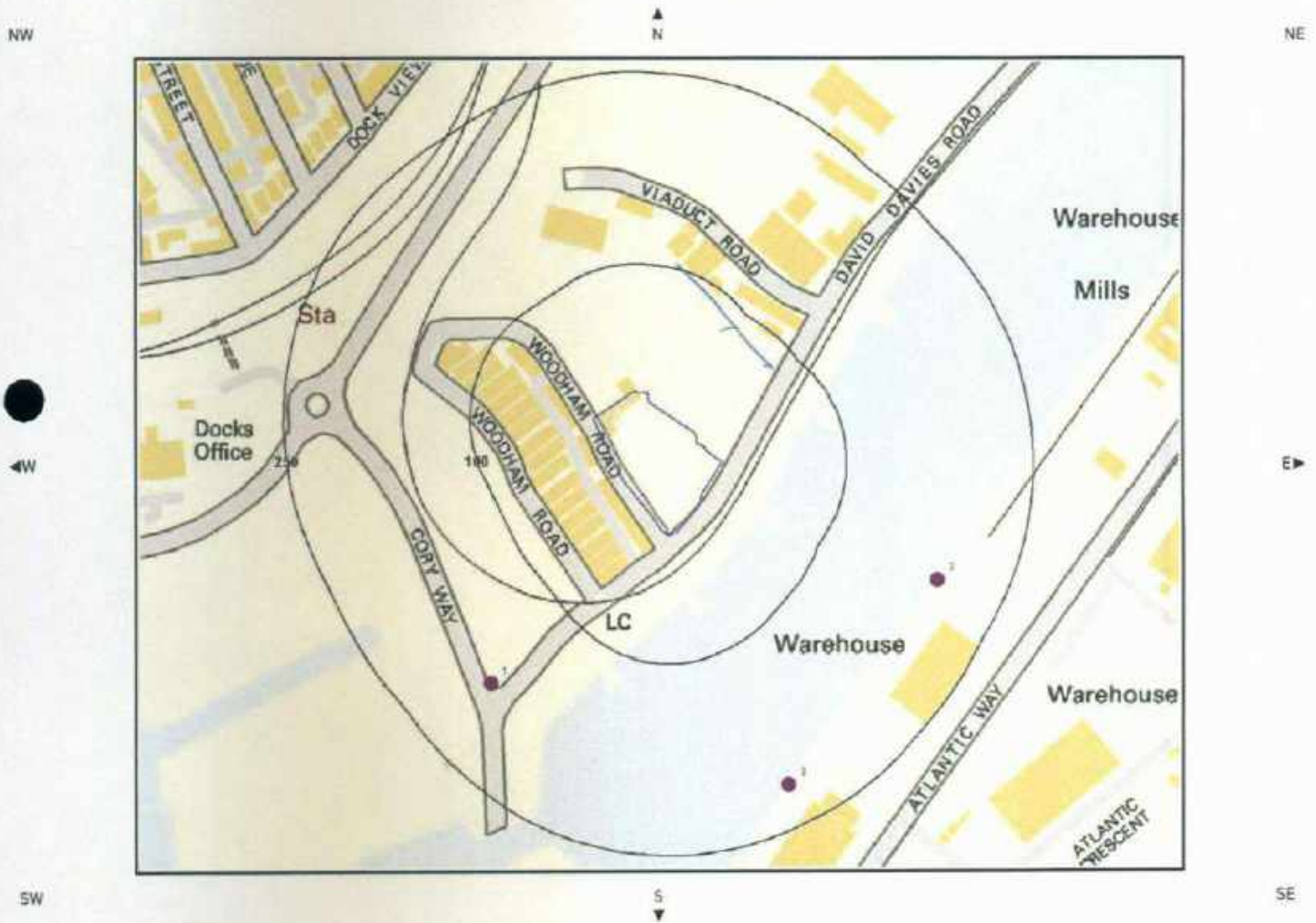
The following **Running Sands** information is provided by the British Geological Survey:



ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.


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5. Borehole Records Map


Borehole Records Legend

-  Site Outline
-  Search Buffers (m)

-  Borehole Locations



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5. Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

3

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length (m)	Borehole Name
1	183.0	SW	312490,167490	ST16NW109	1.8	BARRY DUCK CUSTOMS & EXICISE BLDG
2	196.0	SE	312850,167570	ST16NW157	14.0	CRANE BEAM, BARRY DOCKS, NO.2
3	217.0	SE	312730,167410	ST16NW158	12.7	CRANE BEAM, BARRY DOCKS, NO.3

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Contacts

GroundSure Helpline

Telephone: 01273 819700

maps&data@groundsure.com**British Geological Survey Enquiries**Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143 www.bgs.ac.uk**British Gypsum**British Gypsum Ltd, East Leake, Loughborough,
Leicestershire, LE12 6HX
Tel: www.british-gypsum.bpb.com**The Coal Authority**200 Lichfield Lane, Mansfield, Notts NG18 4RG
Tel: 0845 762 6848
DX 716176 Mansfield 5 www.coal-authority.co.uk**Ordnance Survey**Romsey Road, Southampton SO16 4GU
Tel: 08456 050505**Getmapping PLC**Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444**Peter Brett Associates**Caversham Bridge House, Waterman Place, Reading
Berkshire RG1 8DN
Tel: +44 (0)118 950 0761 E-mail: reading@pba.co.uk**Acknowledgements**

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Appendix 18

Historical Maps



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: MasterMap

Map date: 2007

Scale: 1:2,500

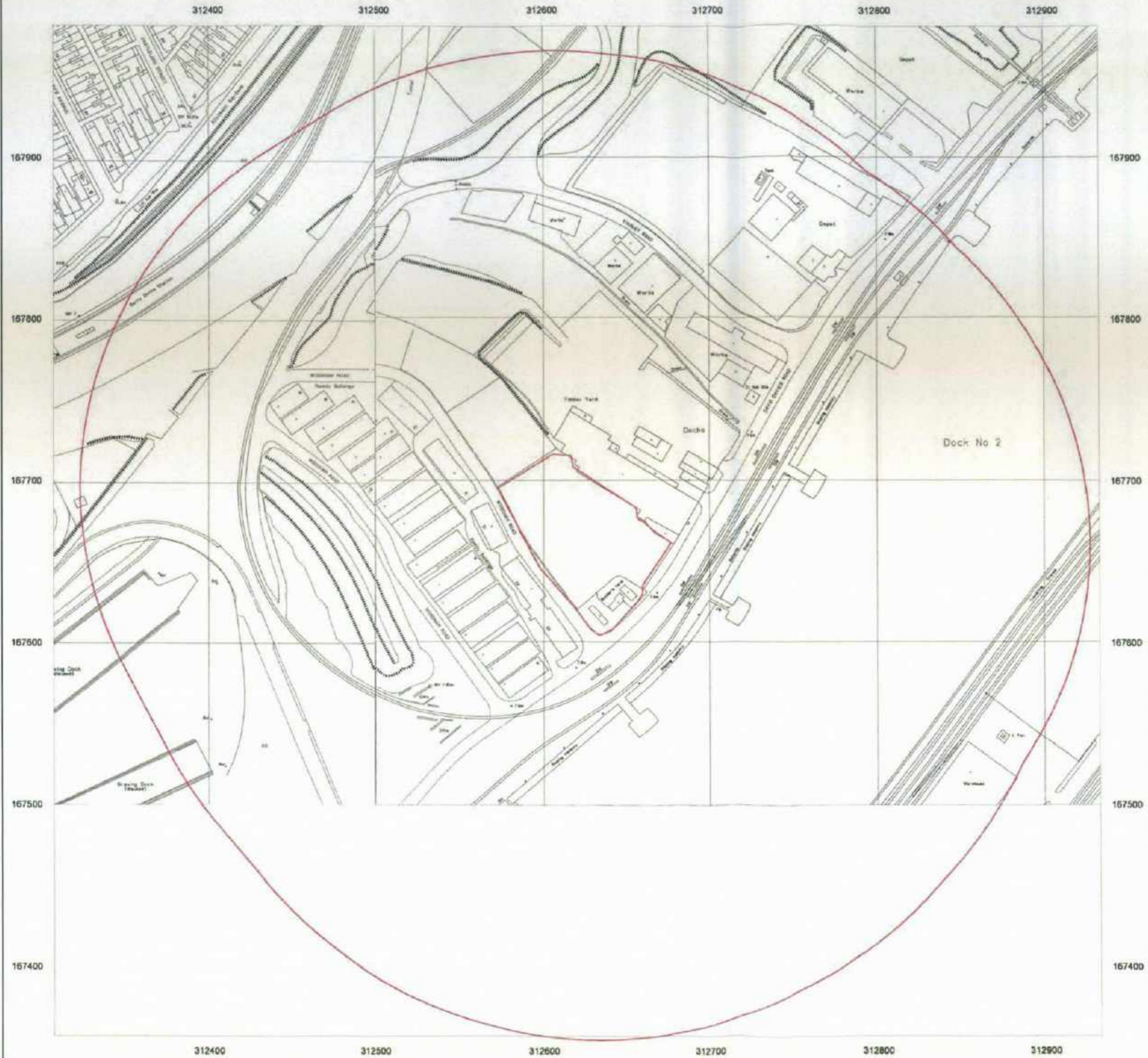
Printed at: 1:2,500



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Site Details:
 WOODHAM ROAD, DOCKS,
 BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: National Grid

Map date: 1996

Scale: 1:1,250

Printed at: 1:2,500

Surveyed 1996 Revised 1996 Edition NA Copyright 1996 Levelled NA	Surveyed 1996 Revised 1996 Edition NA Copyright 1996 Levelled NA
--	--

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Page 2


Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

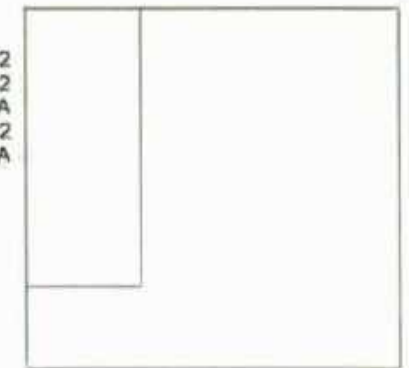
Map Name: National Grid

Map date: 1992

Scale: 1:1,250

Printed at: 1:2,500

Surveyed 1992
Revised 1992
Edition NA
Copyright 1992
Levelled NA



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Page 3



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: National Grid

Map date: 1987-1990

Scale: 1:1,250

Printed at: 1:2,500

Surveyed 1961
Revised 1987
Edition NA
Copyright 1987
Levelled 1961

Surveyed 1961
Revised 1990
Edition NA
Copyright 1990
Levelled 1961

Surveyed 1961
Revised 1990
Edition NA
Copyright 1990
Levelled 1961

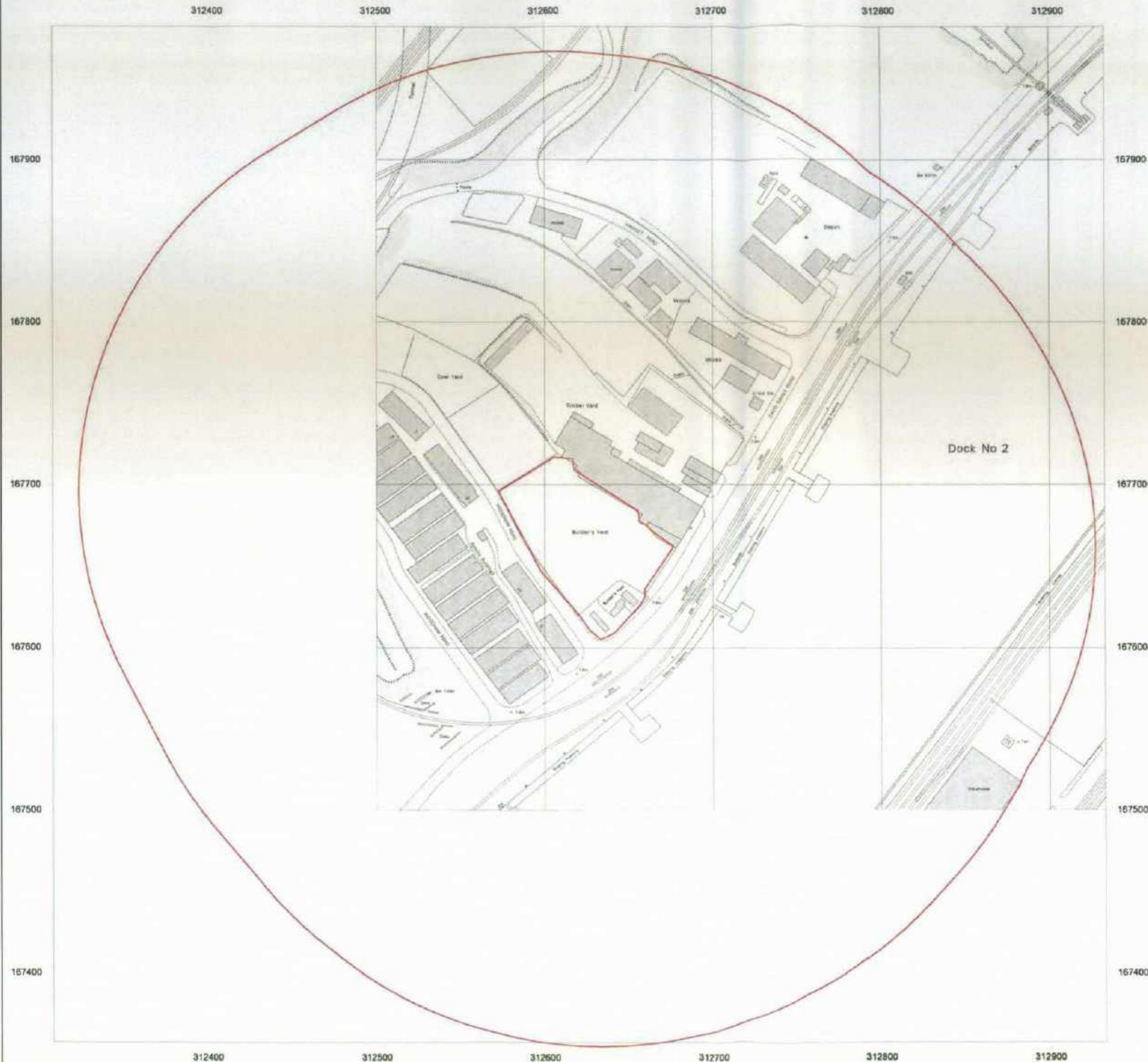


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Page 4



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: National Grid

Map date: 1989

Scale: 1:1,250

Printed at: 1:2,500

Surveyed 1955
Revised 1989
Edition NA
Copyright 1989
Levelled NA

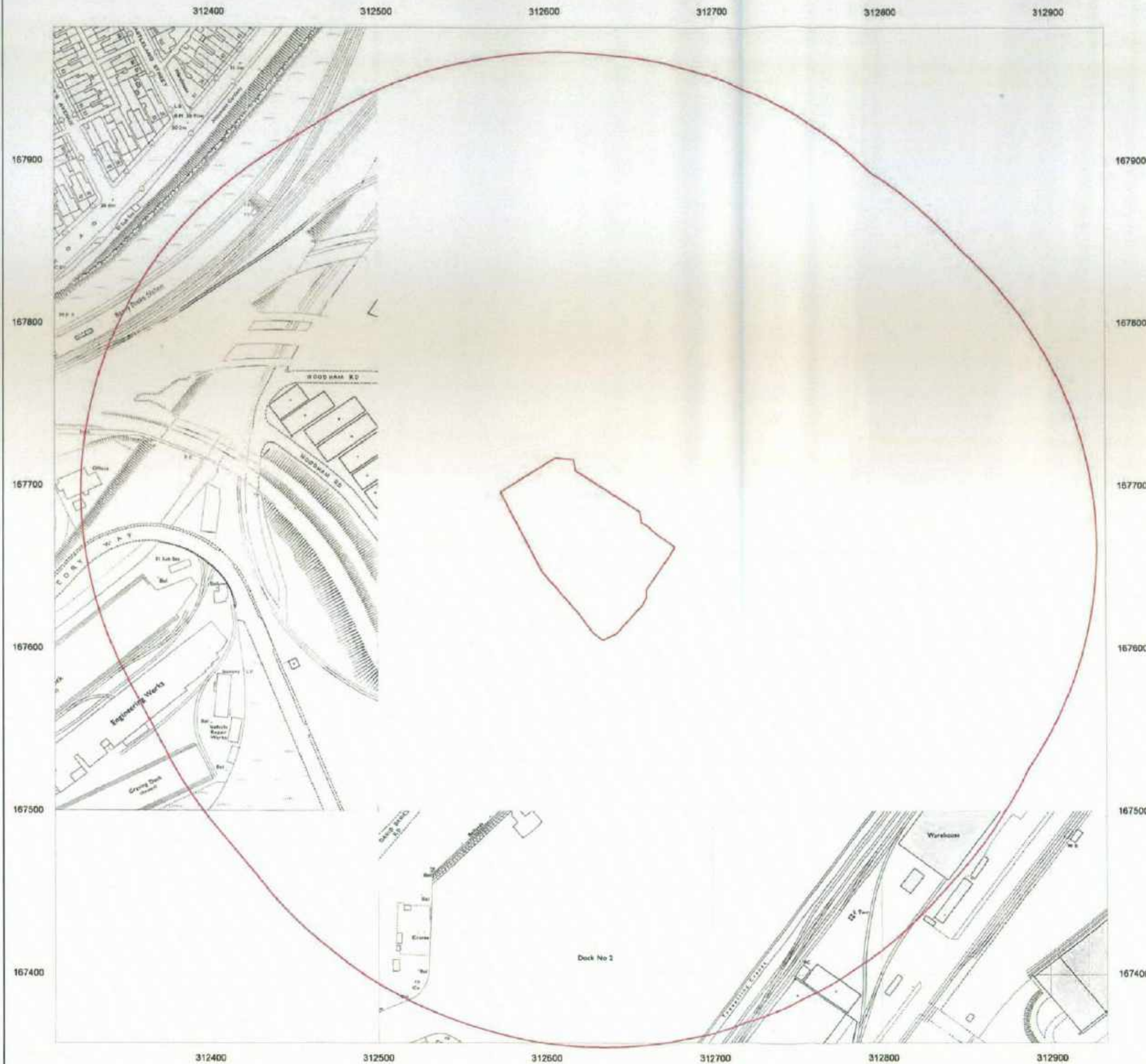


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Production date: 07 March 2008

Page 5



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

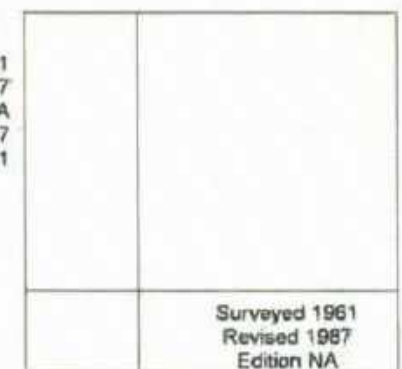
Map Name: National Grid

Map date: 1987

Scale: 1:1,250

Printed at: 1:2,500

Surveyed 1961
Revised 1987
Edition NA
Copyright 1987
Levelled 1961



Surveyed 1961
Revised 1987
Edition NA
Copyright 1987
Levelled 1961

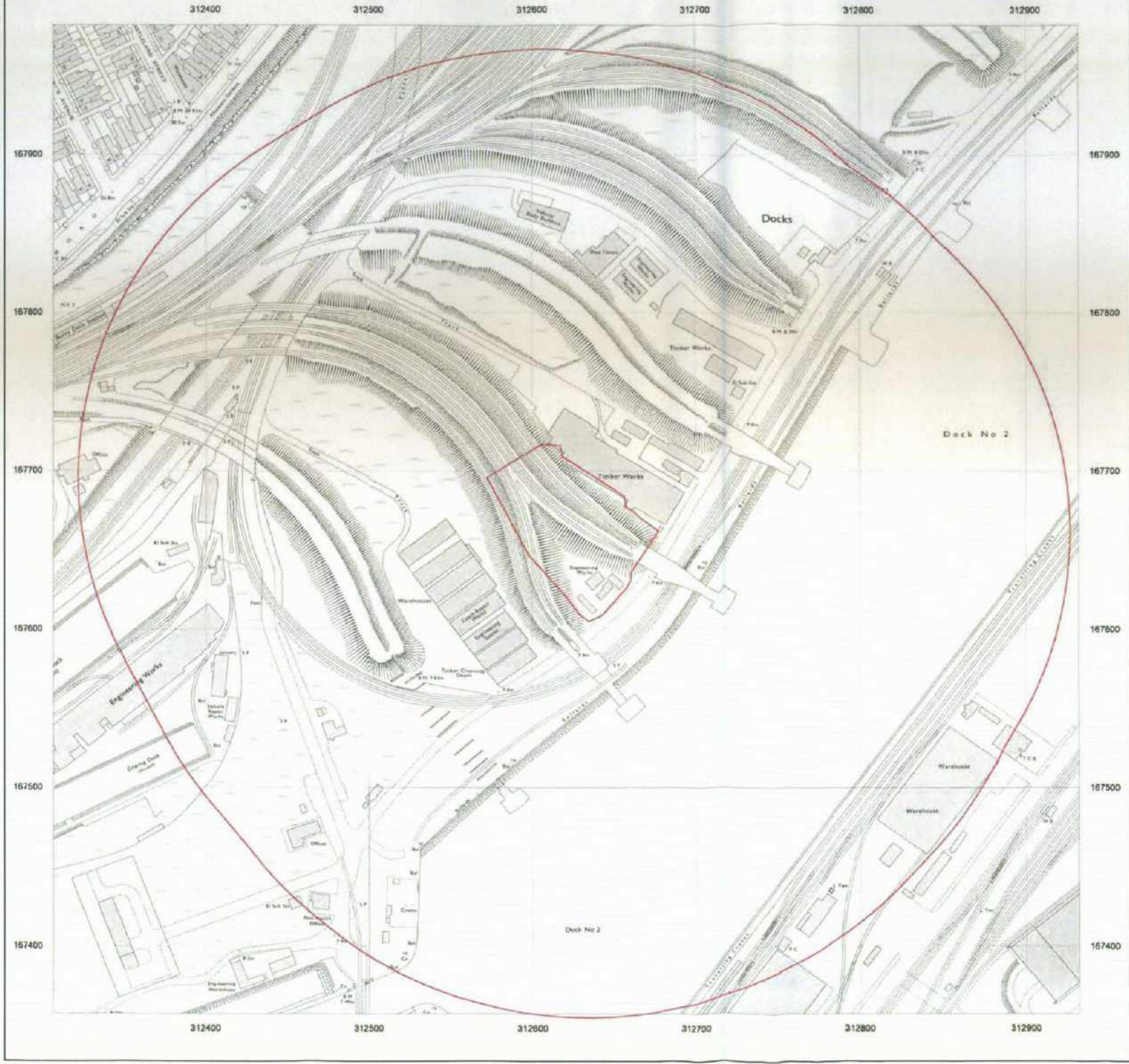


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Production date: 07 March 2008

Page 6



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: National Grid

Map date: 1971

Scale: 1:1,250

Printed at: 1:2,500

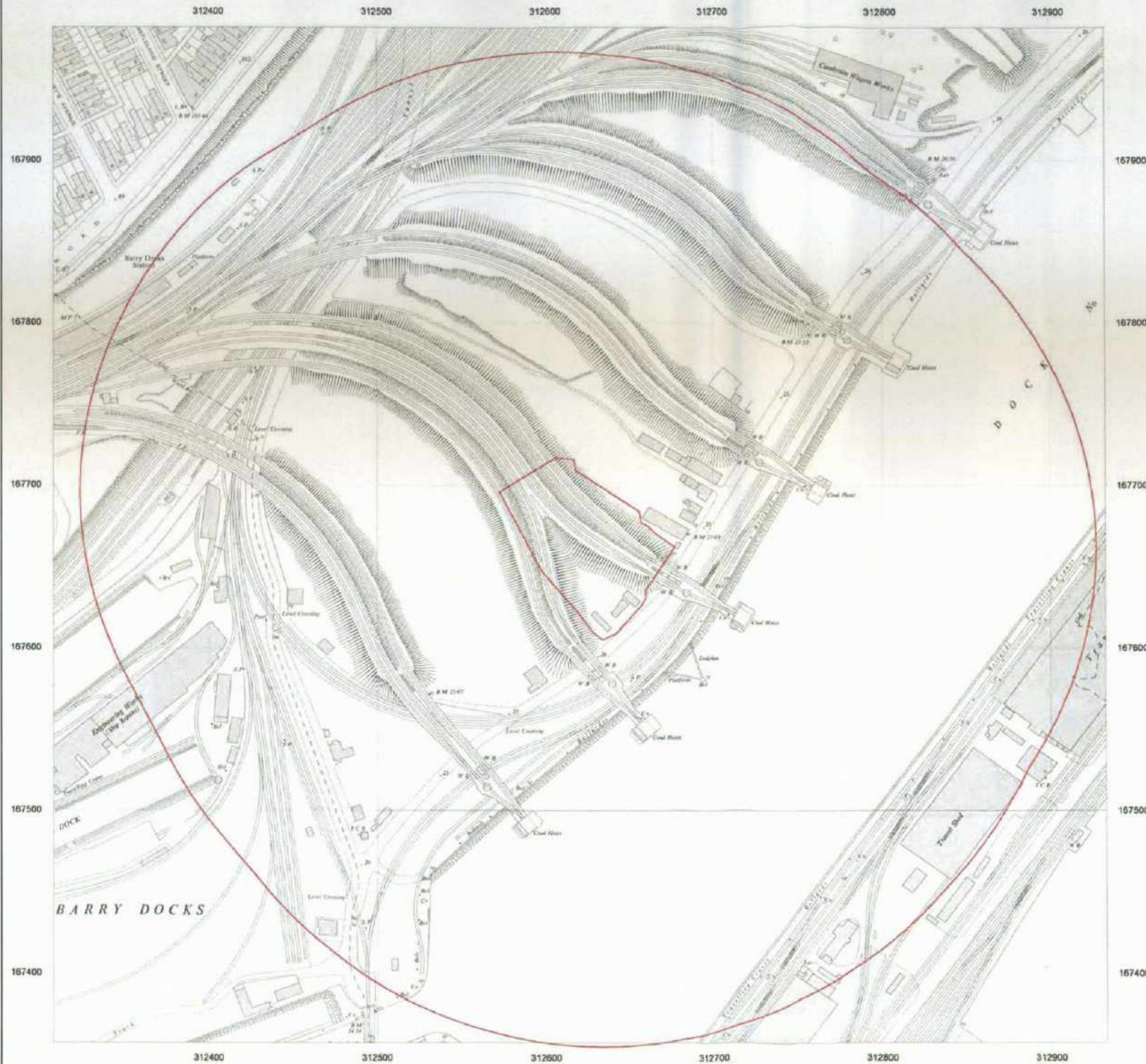
<p>Surveyed 1954 Revised 1971 Edition NA Copyright 1971 Levelled 1961</p>	<p>Surveyed 1955 Revised 1971 Edition NA Copyright 1971 Levelled 1961</p>
<p>Surveyed 1954 Revised 1971 Edition NA Copyright 1971 Levelled 1961</p>	<p>Surveyed 1955 Revised 1971 Edition NA Copyright 1971 Levelled 1961</p>



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Production date: 07 March 2008



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: National Grid

Map date: 1954-1955

Scale: 1:1,250

Printed at: 1:2,500

<p>Surveyed 1954 Revised 1954 Edition NA Copyright NA Levelled 1948</p>	<p>Surveyed 1955 Revised 1955 Edition NA Copyright NA Levelled 1948</p>
<p>Surveyed 1954 Revised 1954 Edition NA Copyright NA Levelled 1948</p>	<p>Surveyed 1955 Revised 1955 Edition NA Copyright NA Levelled 1948</p>



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Production date: 07 March 2008



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: National Grid

Map date: 1955

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1855
Revised 1955
Edition 1956
Copyright NA
Levelled 1948

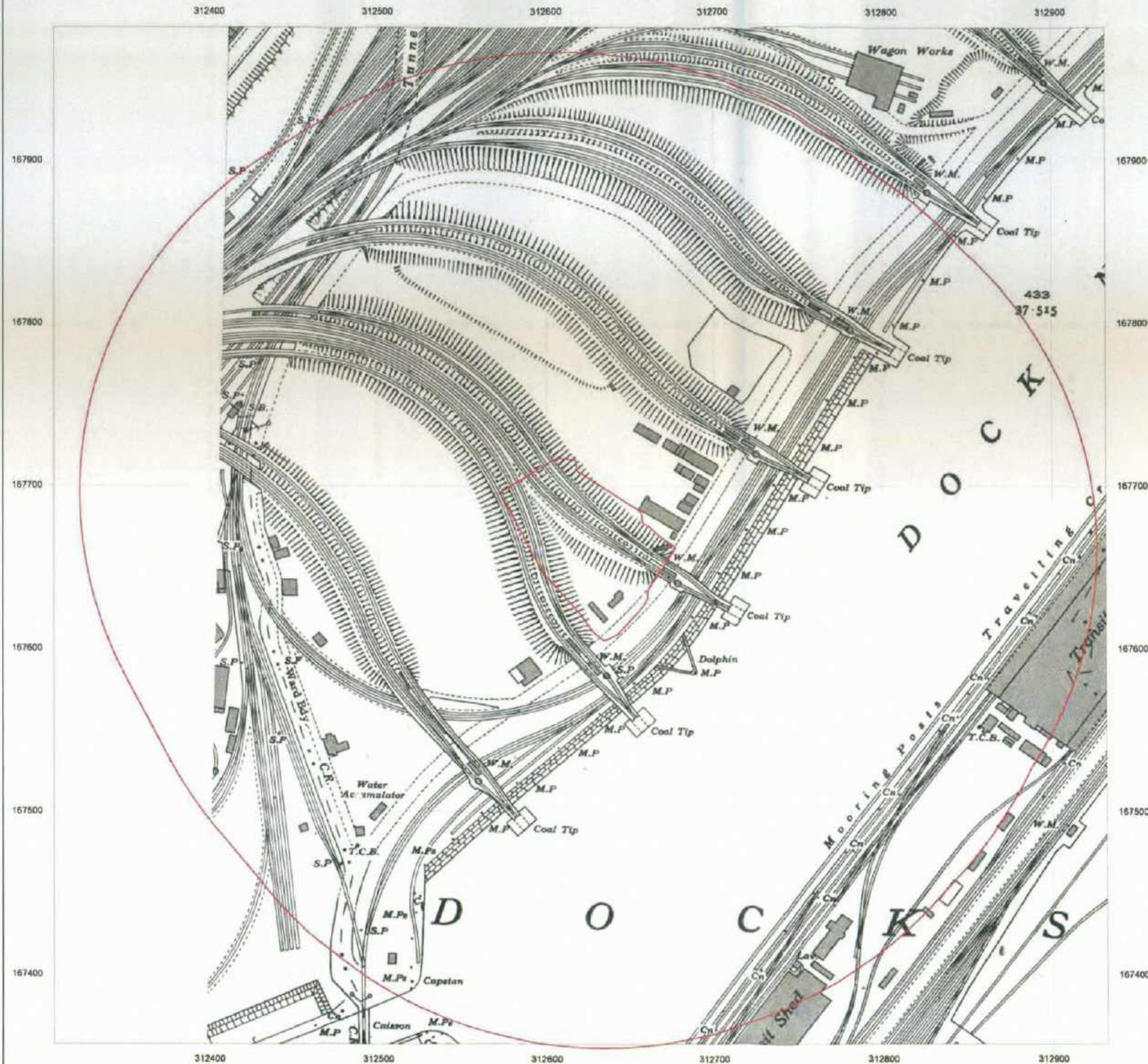


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Production date: 07 March 2008

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Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

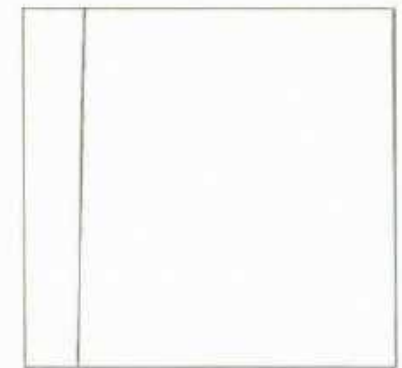
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Map date: 1943

Scale: 1:2,500

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Revised 1943
Edition NA
Copyright NA
Levelled NA

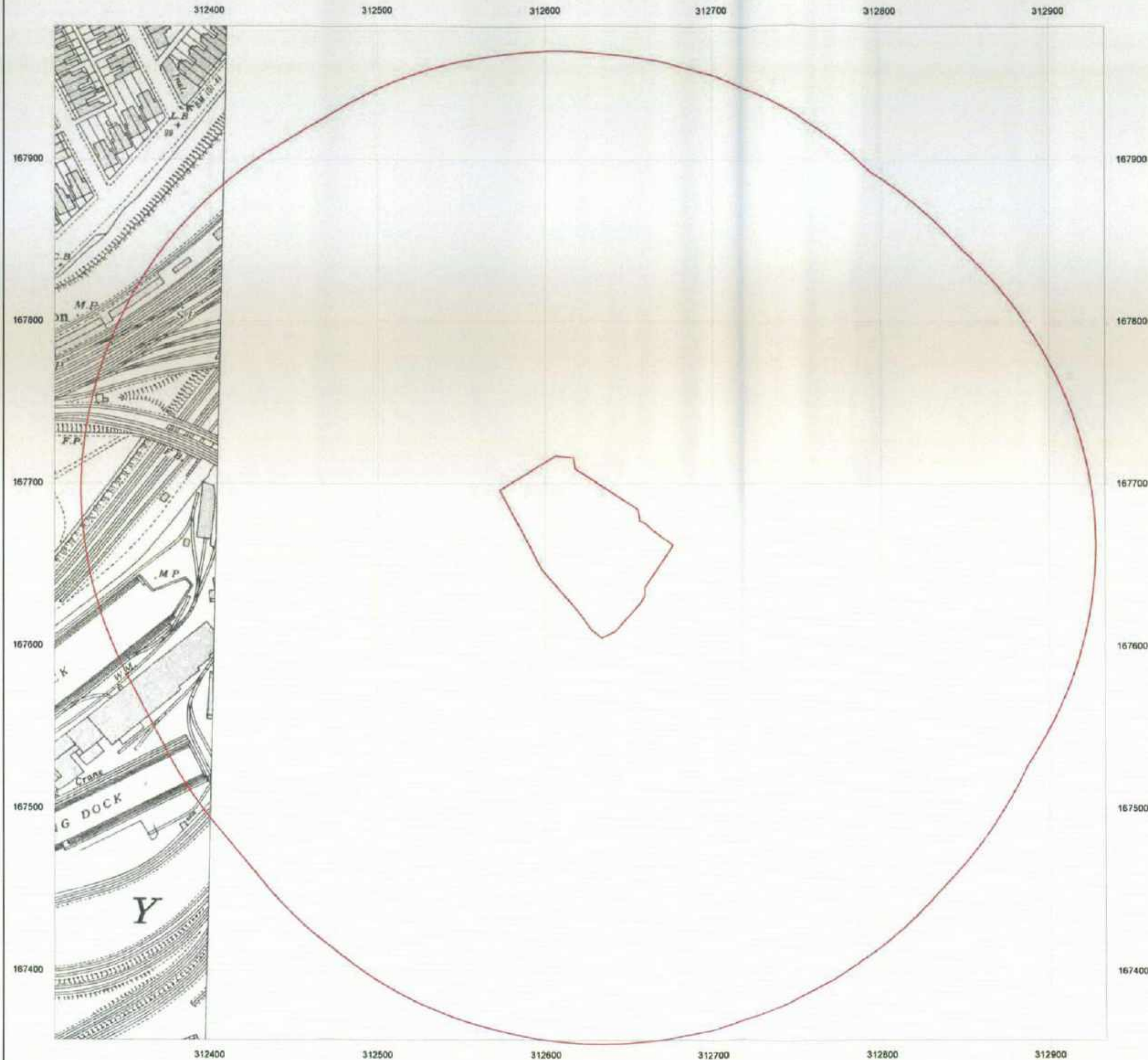


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Production date: 07 March 2008

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Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

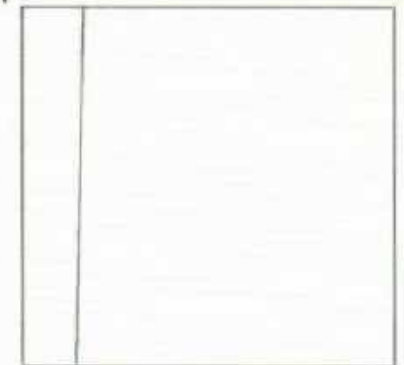
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Revised 1936
Edition NA
Copyright NA
Levelled NA

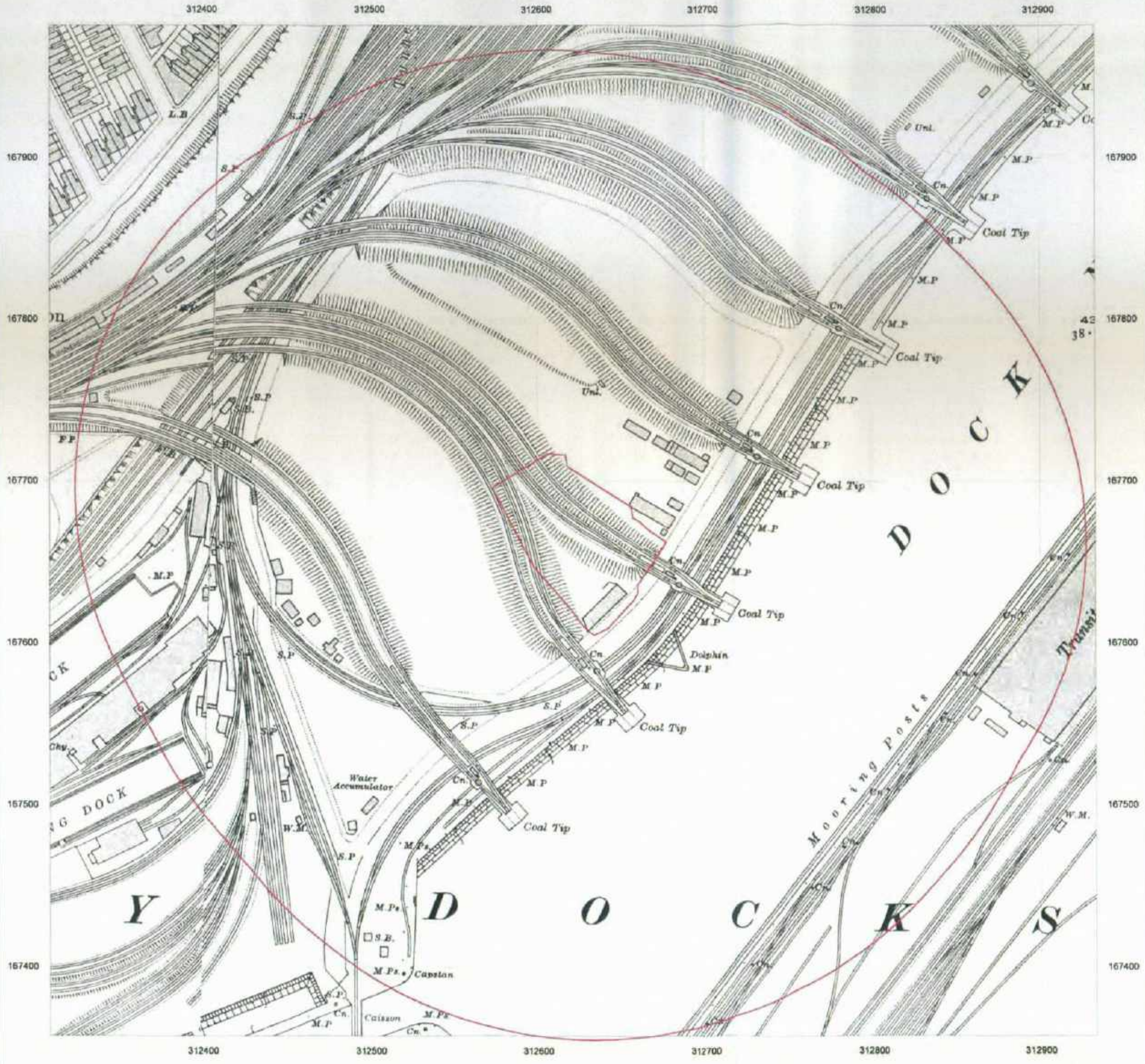


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Production date: 07 March 2008

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Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: County Series

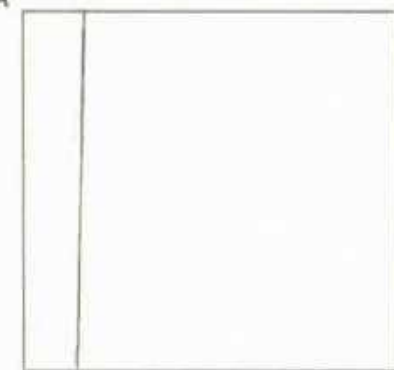
Map date: 1920

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1920
Revised 1920
Edition NA
Copyright NA
Levelled NA

Surveyed 1920
Revised 1920
Edition NA
Copyright NA
Levelled NA



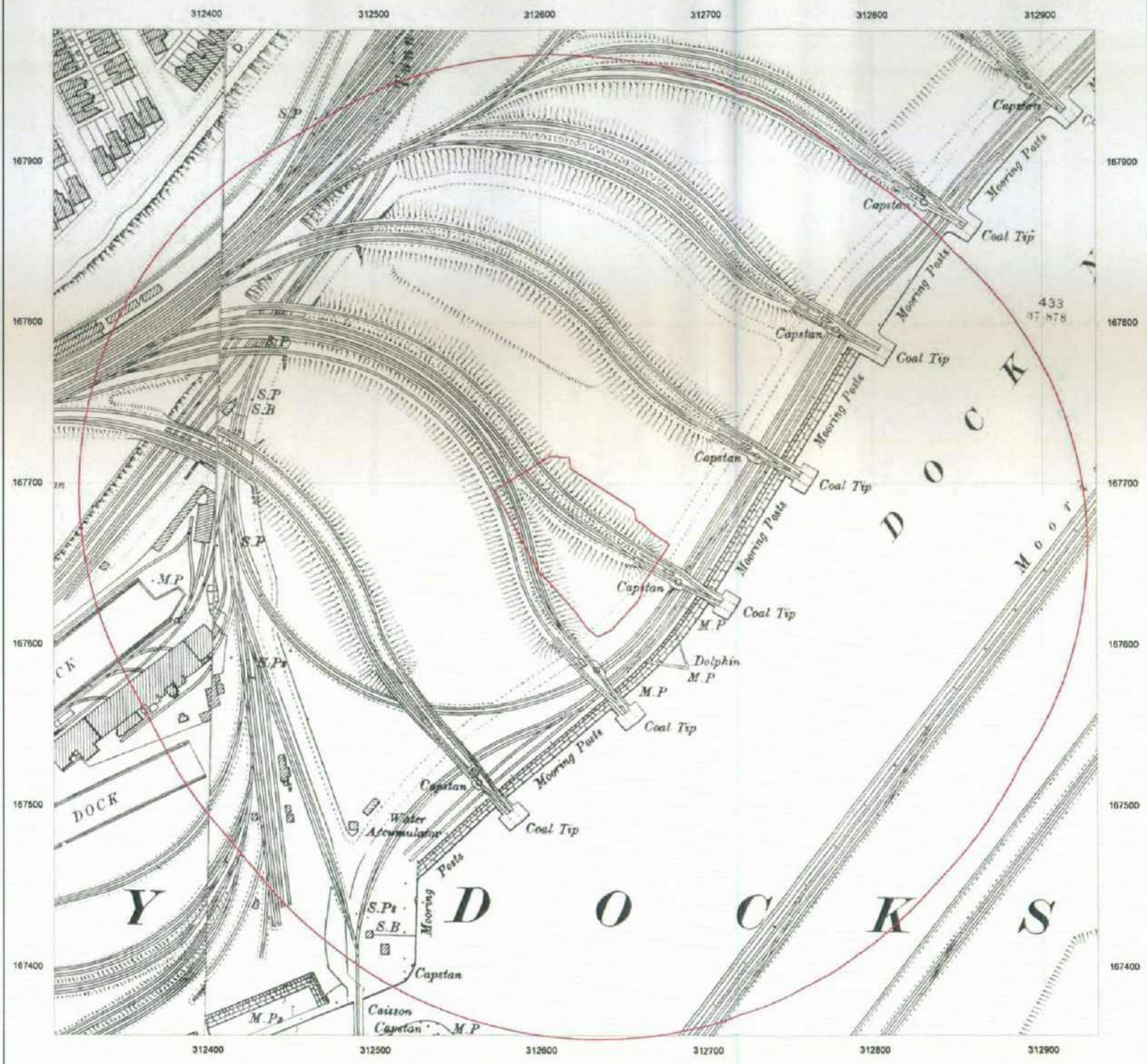
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Production date: 07 March 2008

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Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: County Series

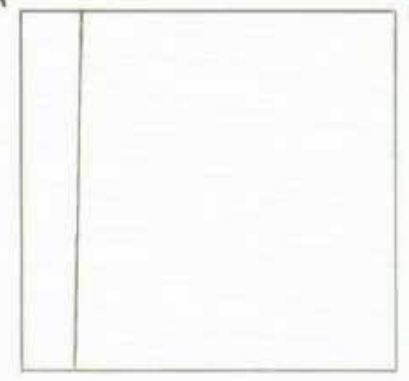
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Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1900
Revised 1900
Edition NA
Copyright NA
Levelled NA

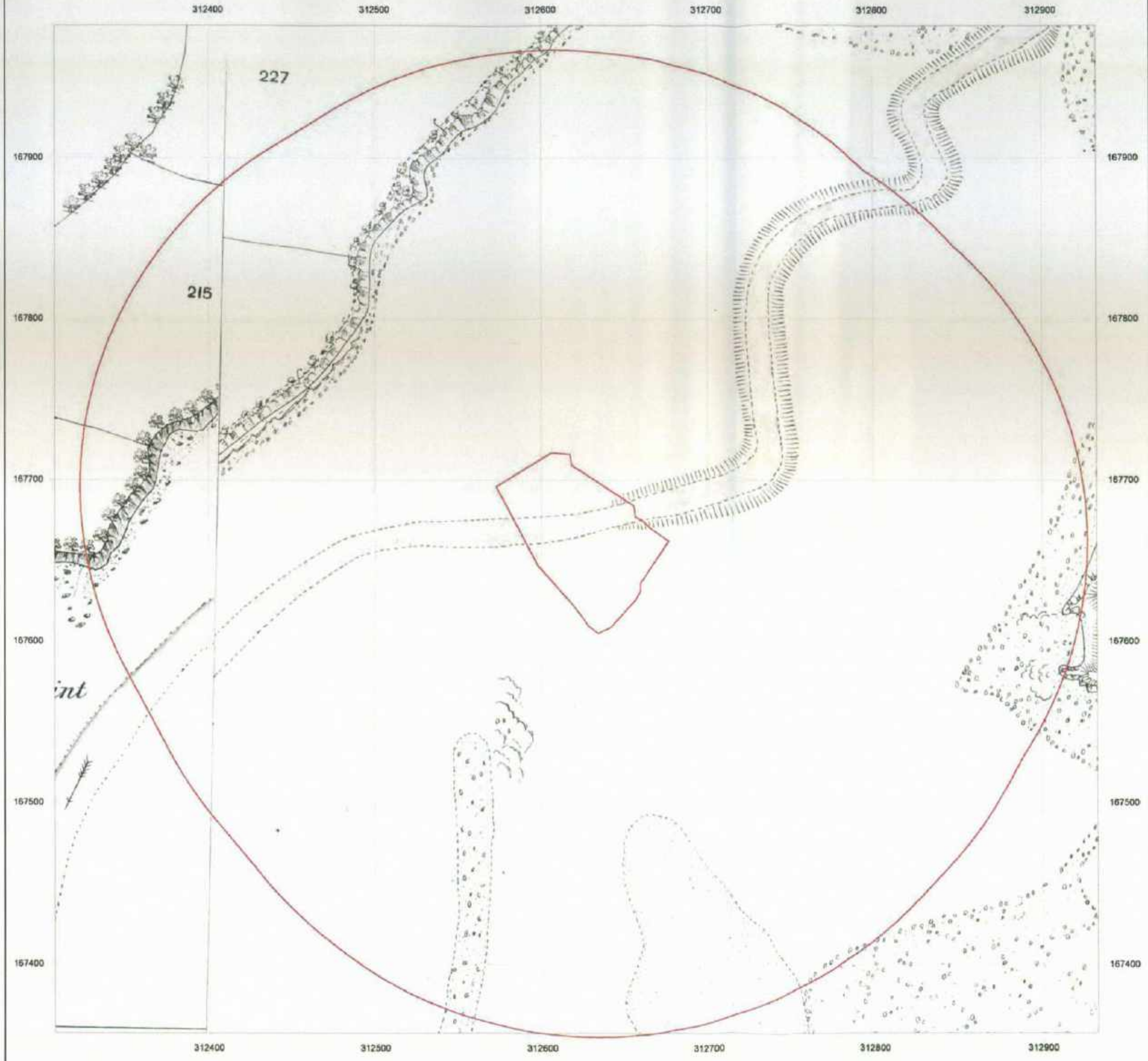
Surveyed 1900
Revised 1900
Edition NA
Copyright NA
Levelled NA



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Production date: 07 March 2008



Site Details:

WOODHAM ROAD, DOCKS,
BARRY, CF62

Client Ref: Barry
Report Ref: HMD-188-62959
Grid Ref: 312620, 167670

Map Name: County Series

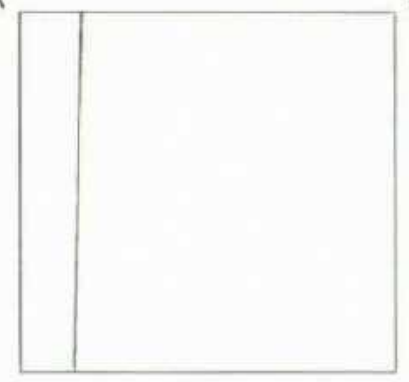
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Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1880
Revised 1880
Edition NA
Copyright NA
Levelled NA

Surveyed 1879
Revised 1879
Edition NA
Copyright NA
Levelled NA



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Production date: 07 March 2008



Appendix 19

Preliminary Risk Assessment

PRELIMINARY RISK ASSESSMENT

David Davies Road,
Barry Docks, Wales



BASIS OF REVIEW: GROUNDSURE ENVIRONMENTAL REPORT AND SITE WALKOVER AND BOREHOLE RECORDS

Site Location and Surrounding Land Use

The site is situated on the north west side of David Davies Road at Barry Docks, Wales and can be located by National Grid reference 312620, 167670. It lies approximately 700m south east of Barry town centre, in a predominantly industrial area. A site location plan is presented as Figure 1. The site is approximately 0.13ha in area and comprises disused land in the south and east and a container storage yard in the north and west. A site plan indicating the current building layout is shown in Figure 2. The site lies at an approximate elevation of 8m above Ordnance datum (AOD). The site is bordered by David Davies Road to the south east, Woodham Road to the south west, a coach service and repair yard to the north east and container storage and waste land to the north west. The nearest residential properties are located approximately 300m north west of the site.

Proposed Development

The proposed redevelopment works at the site involve the construction of a Biomass power plant.

Geology, Hydrogeology and Hydrology

The site is reported (in the Groundsure Report) to be underlain by made ground overlying Tidal Flat Deposits (clay, silt and sand) underlain by Mercia Mudstone. The Mercia Mudstone Formation is classed as a non-aquifer with the overlying soils (tidal flat deposits) reported as being a minor aquifer and as having low permeability. Borehole records from the British Geological Survey (BGS), drilled on the opposite bank of the docks, report made ground to a depth of 12.9m bgl beneath which mudstone was encountered. Several coal tips are indicated 50m to the south east, however the site is not reported to lie within 1000m of a known area of mining activity. A geological fault is reported 190m to the south east.

The Health Protection Agency information contained within the Groundsure Report indicates that less than 1% of properties in the area are above the radon action level and the Building Research Establishment states that no radon protective measures are necessary for the site.

The site is not situated within 500m of a groundwater source protection zone (SPZ). There are no licensed groundwater abstractions within 1km of the site and the closest surface water abstraction is for mineral washing and is located approximately 650m to the south east. The nearest surface watercourse is understood to be the dock, located approximately 40m south east of site. Information from the Environment Agency indicates that the southern site boundary is just located within a zone 2 floodplain, estimating the annual probability of flooding due to rivers and the sea to be 0.1-1.0% for rivers and 0.1-0.5% for the sea. The site also lies within 50m of areas susceptible to groundwater flooding.

Site Environmental Sensitivity

The site is located within a predominantly industrial dockland area, with the nearest residential properties located approximately 300m to the north west. The site is reportedly underlain by made ground over Tidal Flat Deposits (clay, silt and sand), overlying Mercia Mudstone. The Mercia Mudstone Formation is classified as a non-aquifer and the Tidal Deposits are reported to have low permeability. The nearest surface water body is located approximately 40m south east of the site. There are no designated ecological receptors such as Sites of Special Scientific Interest within 500m of the site. On the basis of the above information, the environmental sensitivity of the site is considered to be low.

Site History Review

A review of the site history has been carried out through the study of available Ordnance Survey (OS) maps dating from the late 1800s. The review is designed to identify potential historic sources of contamination that may have impacted soil or groundwater quality beneath the site and to identify any potentially contaminative land uses in the area that may have affected the site.

On site – In 1878 the site is shown to lie within an area of tidal mud flats, with the Cadoxton River shown to cross the centre of the site from east to west. By 1898-1900 the site forms part of an area of reclaimed land, created for the construction of the docks and is shown to include several railway lines for access to the docks (labelling on later maps indicate that these are likely to be for the transport of coal). From 1915 to 1955 various unmarked buildings, located between the railway lines in the south part of site, later identified as engineering works in 1971. By 1982 the railway sidings

PRELIMINARY RISK ASSESSMENT

David Davies Road,
Barry Docks, Wales



BASIS OF REVIEW: GROUNDSURE ENVIRONMENTAL REPORT AND SITE WALKOVER AND BOREHOLE RECORDS

are no longer shown on site and by 1989 a builders yard occupies the buildings of the former engineering works. From 2002 until the most recent map of 2007 no buildings are indicated in the south of the site but three unmarked structures are shown on the northern site boundary.

Surrounding Area – The map of 1878 shows the site to be surrounded by tidal mud flats, beyond which is agricultural and moorland to the north, east and west and large areas of exposed rock to the south. By 1898-1900 the site is surrounded by railway sidings to the east and west, with the main trunk line and station approximately 200m to the north west. A dock and associated coal tips are indicated ~40m to the south east, a graving/dry dock is shown ~200m to the west and the nearest residential properties are located ~300m to the north west. The map of 1915 indicates a fresh water reservoir ~800m to the east. The surrounding area remained greatly unchanged until the map of 1971. From 1971 until the most recent map of 2007 various buildings are shown ~30m to the south west of the site, uses including warehouses, engineering works and vehicle repair. From 1971 until 2002 a timber yard was shown directly to the north east, however the yard and associated building were absent in the map of 2007.

Summary of Environmental Database Information

Pollution Incidents – Two entries on the national incidents recording system (NIRS) List 2 pollution incidents are reported within the Groundsure report at a distance of ~110m to the south west. Both incidents are indicated to have caused no impact to land and air and only minor impact to water. The nearest licensed discharge consent is approximately 50m south east of site and the effluent is unspecified.

Landfill Sites – Three historic landfills lie within 500m of the site, the closest is reported to have accepted industrial and household waste and is located ~180m to the south west in the area of the old dry dock. The other landfills are located ~330m to the south east and 500m to the south. Other Environment Agency registered waste sites are located 300 and 330m south west, 470m east of site. The nearest operational landfill site is located approximately 900m to the north east.

Potentially Contaminative Industrial Sites – Due to the industrial nature of the surrounding land use, the Groundsure report lists 56 potentially contaminative industrial sites within 500m of the site. The nearest of these are several vehicle servicing and repair workshops ~60m to the south west. Other nearby land uses listed are located to the north east of site and include an electricity substation (~100m), engineering works (~110-150m) and transport and haulage depots (~170-190m). However it is worth noting that during the site walkover it was observed that a building ~15m to the west was being used as a vehicle repair workshop (see below).

Site Walkover

A site walkover was undertaken on 29 July 2008. The area of the site in the south and east was vacant, with open access, while the area in the north and west housed numerous storage containers and could not be accessed safely at the time of the site walkover. Photographs from the site walkover are presented at the end of this report.

Generally the site was level comprising a surface of rolled gravel with occasional low-lying vegetation. Banked hedgerow forms the south western and north eastern site boundaries and the perimeters to north east and north west of former builders yard. Concrete foundations were noted in the south west corner in the location of the former builders yard. Items of waste including wood, metal, upholstery, paint cans and a gas canister were observed across the site.

Where visible, the contents of the storage containers comprised scrap metal (possibly vehicle parts), cardboard, wood and upholstery and a car and a fuel storage tank were observed on top of two of the containers. The presence of the scrapped car and observations made of the visible containers suggests that the site and the numerous containers may have been used for vehicle storage. From the perimeter of the site it was observed that the locked yard in the north housed numerous containers, wooden sheds and a double height corrugated metal structure.

Surrounding land uses included a coach service and repair yard directly to the north and east and an antiques storage warehouse and vehicle workshop to the south and west. More storage containers and scrap metal were observed on the land directly to the north west of site.

BASIS OF REVIEW: GROUNDSURE ENVIRONMENTAL REPORT AND SITE WALKOVER AND BOREHOLE RECORDS

Potential Contamination Sources, Pathways and Receptors

Sources

- Made ground/fill materials that were used for land reclamation and in the levelling of site after removal of railways;
- Possible asbestos-containing materials (ACMs) in the existing building fabric;
- Ground gases from nearby coal tips (if they extend below ground) and from made ground used in the reclamation works;
- Hydrocarbon impact (petrol/diesel/oils/solvents) and heavy metals associated with the sites possible use for vehicle repair/storage and use as engineering works
- Hydrocarbon (fuel and lubricating oils), ash, coal, sulphate and herbicide impact associated with sites former use as railway sidings;
- Ground gases and leachate from historic and current landfill sites;
- Organic and/or inorganic impact associated with treatment processes at adjacent historic timber yard and potentially at builders yard; and
- Hydrocarbon impact (petrol/diesel/oils/solvents) associated with adjacent coach and vehicle repair workshops.

Pathways

- Surface water run-off and/or infiltration;
- Groundwater migration into and within underlying Tidal Flat Deposits;
- Dermal contact, ingestion, dust and vapour inhalation;
- Ground gas migration in permeable soils or existing/proposed service runs;
- Root uptake; and
- Permeation of plastic utilities or attack of building infrastructure by aggressive ground conditions.

Receptors

- Shallow groundwater in the Tidal Flat Deposits or made ground;
- Surface watercourse (docks) 40m south east of the site;
- Construction workers during redevelopment works;
- Future site workers and visitors;
- Neighbouring residents 300m north west of site and adjacent workers;
- Vegetation;
- Building foundation materials and
- Infrastructure.

A linkage between the site and any neighbouring residents is considered incomplete due to the distance to the nearest residential property being in the region of 300m. Groundwater beneath the site is assumed to flow in a south westerly direction towards the entrance of the dock and hence only the neighbouring site to the north and east was considered in the preliminary risk assessment for vapour inhalation pathways to onsite receptors.

Once the redevelopment works are completed a linkage with respect to direct contact to adjacent workers is also considered incomplete owing to the hardstanding and vegetation that will limit dust generation. During redevelopment works, risks associated with dust migration can be mitigated by damping exposed soil during partially dry conditions.

PRELIMINARY RISK ASSESSMENT

David Davies Road,
Barry Docks, Wales



BASIS OF REVIEW: GROUNDURE ENVIRONMENTAL REPORT AND SITE WALKOVER AND BOREHOLE RECORDS

Outline Conceptual Model and Risk Classification

Potential Source	Potential Receptor	Possible Pathway	Likelihood	Severity	Risk Class
Contamination associated with the sites former use for coal transport, vehicle repair/storage, fill materials used for land reclamation and in the levelling of site after removal of railways, builders yard and engineering works	Shallow groundwater in the Tidal Flat Deposits and made ground and surface watercourses	Leaching through unsaturated zone and lateral migration	Likely	Mild	Moderate/ Low
	Construction workers	Soil ingestion, dust inhalation & dermal contact	Likely	Minor	Low ⁽¹⁾
	Future site workers and visitors	Soil ingestion, dust inhalation & dermal contact	Unlikely	Medium	Low
	Vegetation	Root uptake	Unlikely	Minor	Very low
	Building Infrastructure	Direct contact with building foundations	Likely	Mild	Moderate/ Low
ACMs in current building fabric	Construction workers	Dust inhalation	Low	Medium	Moderate/ Low ⁽¹⁾
Ground gases from on-site made ground, nearby coal tips and current and historic landfills	Construction workers	Inhalation and gas ingress into buildings	Likely	Medium	Moderate
	Future site workers and visitors	and inhalation	Low		Moderate/ Low
	Vegetation	Root uptake	Low	Minor	Very low
Hydrocarbon impact (petrol/diesel/engine oil and solvents) associated with adjacent coach repair yard and historic and timber yard	Future site workers and visitors	Direct contact including ingestion, dermal contact and/or inhalation of dust	Unlikely	Medium	Low
	Construction workers		Unlikely	Minor	Very low ⁽¹⁾
	Future site workers and visitors	Inhalation of vapours	Low	Medium	Moderate/ Low

(1) The risk classification regarding hydrocarbon exposure to site construction workers was made with the understanding that appropriate levels of hygiene are maintained and personal protective equipment is worn at all times.

PRELIMINARY RISK ASSESSMENT

David Davies Road,
Barry Docks, Wales



BASIS OF REVIEW: GOUNDSURE ENVIRONMENTAL REPORT AND SITE WALKOVER AND BOREHOLE RECORDS

The outline Conceptual Model has identified the following potential pollutant linkages with a Risk Class of Moderate/Low or higher:

- Impact to building infrastructure, i.e. permeation of plastic water supply pipes or damage to foundations due to aggressive ground conditions;
- Impact to shallow groundwater from onsite fill materials and contaminants due to previous land uses;
- Dust inhalation of ACMs by construction workers;
- Inhalation of ground gases from onsite made ground (and potentially from nearby coal tips and landfill sites) by construction workers and future site workers and visitors; and
- Inhalation of hydrocarbon/solvent vapours originating from the adjacent coach repair and historic timber yard by construction workers and future site workers and visitors.

PRA Conclusions and Recommendations

The PRA undertaken by RSK has identified a number of potential pollutant linkages associated with the site. The presence or otherwise of asbestos-containing materials (ACMs) within the existing building fabric should be determined (if not already done so) and any ACMs removed by a licensed asbestos contractor before the demolition of the buildings on site.

In order to determine the nature, extent and source of any on-site contaminants relating to previous land workings/uses and to identify any migration of contaminants from off-site sources, it is recommended that an intrusive geo-environmental survey be carried out. The survey should be designed to include sampling of ground gas, soil and groundwater. Boreholes should be installed to determine the groundwater level/flow direction and to provide geotechnical information for effective foundation design.

The investigation would also need to prove the thickness of made ground and competency of underlying deposits, particularly given the centre of the site overlies the former route of the River Cadoxton. These factors are likely to impact upon foundation solutions for the Biomass power plant.

Estimated Costs for Recommended Further Work

It is important to note that it is very difficult to estimate the costs associated with the recommended further work with a reasonable degree of certainty because RSK has not entered into discussions with the regulatory authorities, including the EA and local authority. The costs presented below are provided as budget estimates.

Type 3 asbestos survey: allow £3,000 to £5,000

Removal of ACMs by licensed contractor: dependent on findings of asbestos survey

Combined geotechnical and contamination assessment (GQRA): allow £25,000 to £30,000

Supplementary DQRA (if needed): allow £5,000

PRELIMINARY RISK ASSESSMENT

David Davies Road,
Barry Docks, Wales



BASIS OF REVIEW: GROUNDURE ENVIRONMENTAL REPORT AND SITE WALKOVER AND BOREHOLE RECORDS

Limitations, Data Gaps and Uncertainties

The comments given in this report and the opinions expressed herein are based on information gathered during a site walkover and a review of information contained within a Groundure environmental database report and BGS borehole records. Where any data supplied by the client or from other 3rd parties have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party.

During the site walkover it was not possible to gain access to the locked storage container yard located on the north of the site and as such the contents of the yard and containers is unknown and could not be taken into account within the PRA.

The costs for further work, have been provided as budget estimates only.

DOCUMENT ISSUE STATUS

Report Issue	FINAL		
Reference Number	320304-R1 (01)		
Title	Name	Signature	Date
Author	Laura Croasdell	<i>L Croasdell</i>	06/08/2008
Project Manager	Laura Croasdell	<i>L Croasdell</i>	06/08/2008
Technical Reviewer	Lucy Thomas	<i>Lucy Thomas</i>	06/08/2008
Quality Reviewer	Lucy Thomas	<i>Lucy Thomas</i>	06/08/2008

PHOTOGRAPHS



Photograph 1: View north towards site from corner of Woodham Road and David Davies Road. Fuel storage tank and scrapped car visible on two of containers.



Photograph 2: View south from north corner of former builders yard

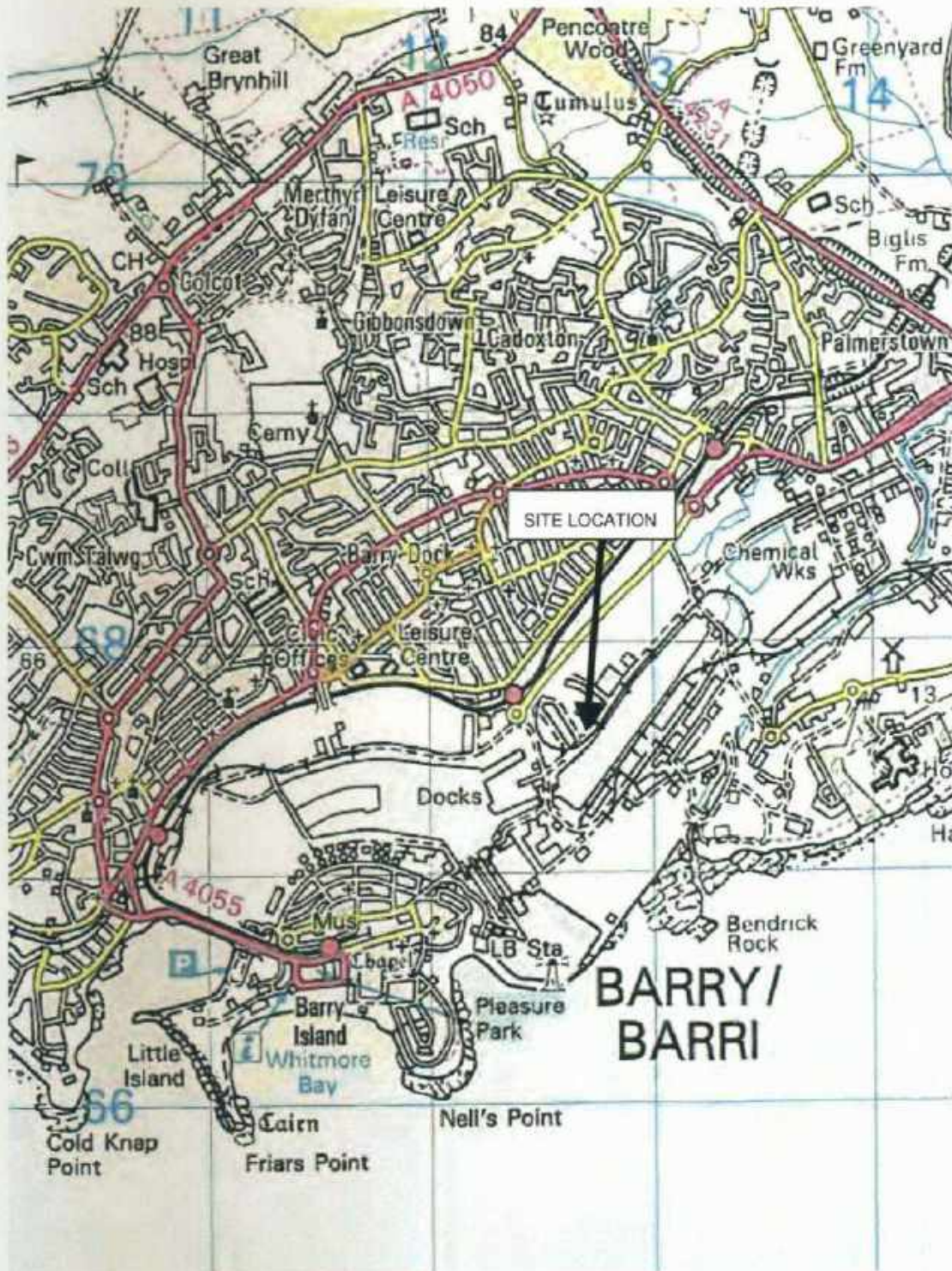


Photograph 3: View north east from south western site boundary



Photograph 4: View north from south western site boundary

FIGURES



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RSK Geoconsult Limited, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT.

SITE LOCATION MAP



LEGEND:



Approximate area of locked container yard



Approximate site boundary

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



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Web: www.rsk.co.uk

Client
SUNRISE RENEWABLES

Project Title
**WOODHAM ROAD,
BARRY DOCKS**

Drawing Title
SITE PLAN

Drawn	Date	Checked	Date	Approved	Date
AMC	28/07/08	LC	28/07/08	LC	28/07/08

Scale	Orig Size	Dimensions
1:1,250	ORIGSIZE	-

Project No.	Drawing File
320304	320304D002A.dwg

Drawing No.	Rev.
FIGURE 2	A



BGS BOREHOLE RECORDS

Holst Soil Engineering Limited

BOREHOLE LOG

ST16NW/15

Borehole No.
295
G157
2

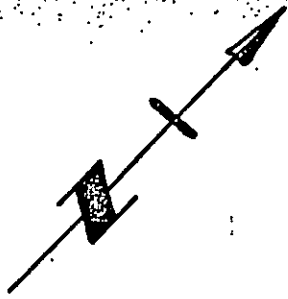
Contract No. 2734/F.3365
 Location Barry Docks
 Client British Transport Docks Board
 Method of Boring Percussion
 Diameter of Borehole 200mm/250mm

Sheet 1 of 1
 Chainage
 Ground Level 7.88m AOD
 Date 26/5/76

Description of Strata	Legend	Depth Below G.L.(m)	Thickness of Strata(m)	Type of Sample	C _u KN/m ²	φ deg	m.c. %	γ Bulk Density	N
MADEGROUND: - limestone chippings		0.40	0.40						
MADEGROUND: - clay, shale and stones		2.80	2.40	1.50					16
MADEGROUND: - Shale, stones, boulders and clay		3.00							21
		4.50							
MADEGROUND: - Clayey shale and stones		5.60	2.80						
		6.50	0.90	6.00					17
MADEGROUND: - Clay, shale and boulders		7.50							34
		9.00							30
		10.50							32
		11.50	5.00						
MADEGROUND: - Clay, shale and stones	12.00							102 for 25mm	
	12.90	1.40							
Moderately weathered brown/grey silty mudstone	13.30							100 for 35mm	
	14.00	1.10	14.00					100 for 25mm	

<p>Key</p> <p>U Undisturbed Sample φ Angle of Friction Q Disturbed Sample m.c. Moisture Content W Water Sample γ Bulk Density P Penetration Test N S.P.T. Value</p>	<p>Remarks (Observations of Ground Water etc.)</p> <p>Water struck at 2.70m Final standing level 2.80m</p>
---	--





SWING BRIDGE

No. 2. DOCK

BH. 5

BH. 4

29

BH. 3

BH. 2

BH. 1

RANKS MILLS.

S.I. BARRY DOCKS.

Borehole locations.

(N.T.S.)

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[ST16NW BJ 157.]



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

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ST16NW
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Holst Soil Engineering Limited

BOREHOLE LOG

Contract No. 2735/F.3365
 Location ... Barry Docks
 Client ... British Transport Docks Board
 Method of Boring ... Percussion
 Diameter of Borehole ... 250mm/200mm

Sheet ... 1 ... of ... 1
 Chainage
 Ground Level ... 7.88m AOD
 Date ... 22/5/76

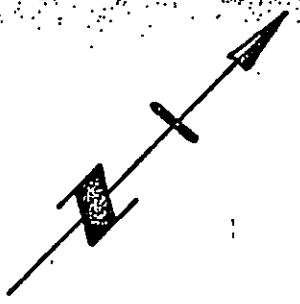
Description of Strata	Legend	Depth Below G.L.(m)	Thickness of Strata(m)	Type of Sample	c KN/sq.m	φ deg	m.c. %	γ Kg/cu.m	N
MADEGROUND:- TAREAC		0.10	0.10						
MADEGROUND:- Hardcore		1.20	1.10	1.50					25
MADEGROUND:- Red marl and stones		2.00	0.80	I					
MADEGROUND:- Shale, stones, clay boulders		3.50	1.50	I					74
BOULDER OBSTRUCTIONS (boulder driven through clay and marl)				5.00		No Penetration			
				7.00		No Penetration			
MADEGROUND:- Shale, stones, clay, boulders		8.50	5.00	8.50					108
				10.00					103 for 180mm
BOULDER OBSTRUCTION		11.50	3.00	11.50					94 for 150mm
		12.70	1.20	12.50		No Penetration			

Key
 □ Undisturbed Sample φ Angle of Friction
 ○ Disturbed Sample m.c. Moisture Content
 Δ Water Sample γ Bulk Density
 I Penetration Test N S.P.T. Value

Remarks (Observations of Ground Water etc.)

Water Struck at 2.70m
 Final Standing Level 2.00m





SWING BRIDGE

No. 2. DOCK

BH. 5

BH. 4

29

BH. 3

BH. 2

BH. 1

RANKS MILLS.

S.I. BARRY DOCKS.

Borehole locations.

(N.T.S.)

16NW
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[ST16NW BJ 158.]



Appendix 20 Landscape Assessment



SUNRISE RENEWABLES LTD

**PROPOSED RENEWABLE ENERGY PLANT
AT WOODHAM ROAD, BARRY**

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

DECEMBER 2009

Prepared by



**17, Chorley Old Road
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Tel: 01204 393006
Fax: 01204 388792
Email: bolton@appletongroup.co.uk**

CONTENTS

- 1. INTRODUCTION AND TERMS OF REFERENCE**
- 2. BASELINE ENVIRONMENT**
- 3. IMPACT ASSESSMENT AND EVALUATION**

Appendix 1 Criteria use for determining the significance of impacts

TAG 1 Location and Context

TAG 2 Site as Existing

TAG 3 Photographic Viewpoints and Zone of Visual Influence

Photographs

1.0 INTRODUCTION AND TERMS OF REFERENCE

1.1 The Appleton Group were commissioned by Sunrise Renewables Ltd in October 2009 to prepare a landscape and visual impact assessment of a proposed renewable energy plant to be located at Woodham Road, Barry. The need for the assessment arises from the preparation of a voluntary Environmental Statement of which this assessment will form a part. In addition this Assessment addresses the concerns of the Local Planning Authority who in refusing planning permission for the development in July 2009, considered that the proposed development would have an adverse impact on the character of adjacent residential areas, and on the Barry Waterfront Development, which is located to the west of the site.

1.2 Methodology

This assessment has been prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment prepared jointly with IEMA and The Landscape Institute (2002). The site was visited and an assessment was made of baseline conditions in terms of the landscape quality and character of the site and its surroundings. Potential view points were established and photographs were taken. A desk top review of National and Local Planning policies related to landscape issues was undertaken. An assessment of the potential impact of the development was made of both the construction and operational phases, covering landscape effects, visual impact and landscape character.

1.3 Landscape effects or impacts are those which as the result of the development might alter the vegetation structure, topography, land use or soils. Visual impacts are those perceived by human receptors as the result in a change of appearance of land as the result of development impacts on character refer to the external visual influence of the development on adjacent landscape and land use.

- 1.4 Proposals for mitigation were made and any residual impacts assessed. The criteria used for evaluating the impact are set out in **Appendix 1** to this document. The predictions and assessments of effects were made in the context of the proposed development as set out on drawing number SRB/03 Revision A and SRB/04 Revision A, prepared by Oaktree Environmental Ltd and dated September 2008.

2.0 BASELINE ENVIRONMENT

2.1 Location and context

The location and context of the site is shown on **Plan TAG 1** appended to this report. The site is located within the Barry Dock complex within an area of existing employment uses and disused industrial sites. The town centre is located to the northwest at higher level. The site itself is 8 metres above sea level. Access to the site is gained from a network of industrial estate roads accessed from Millennium Way, a new road to the north of the site serving the docks and new development further west. The Cardiff to Bridgend railway line is located to the north of that road, and between the road and the site is disused and overgrown land and the dock railway spur line. Immediately adjacent to the site to the west of Woodham Road are a row of Nissen type industrial buildings accessed from Woodham Road that are in active use. Woodham Road itself is used for lorry parking (**Photograph 1**). To the immediate east of the site is open, unused land and a number of fairly modern warehouse or industrial buildings, a scrap metal yard and a haulage depot (**Photographs 2 and 3**). To the south of the site beyond David Davies Road, a railway line and grass is located adjacent to the Dock. Across the dock itself is an 8 storey high grain store building and open storage of containers and pallets (**Photograph 4**). A large chemical works complex is present to the north east, within a distance of 1 km. The nearest residential development is located on Dock View Road to the north and at a distance of 370 metres. The road lies at approximately 30 metres A.O.D at that point, beyond Millennium Way and the railway line.

2.2 Site characteristics

The site extends in area to 0.77 ha (1.86 acres). It is flat and open with no formal boundary enclosures other than some mounding to prevent vehicular access to the west and south, and steel palisade fencing to the

east. There are no buildings present on the site. The characteristics of the site in terms of vegetation and ecology are described in a specialist report prepared by RSK Carter Ecological Ltd. In summary the site consists of either bare ground or ruderal (colonising) grassland, with some scrub vegetation. In landscape terms it is derelict and strewn with litter and fly tipping. **Photograph 1** shows the nature of the site itself and a plan showing the site as existing is attached to the report as **TAG 2**.

2.3 Landscape Policy and Designations

Neither the site nor adjacent land is subject to any National or Local designation in landscape terms. It does not fall within an AONB or an Area of Special Landscape. An Area of Special Landscape is located to the north of Barry (The Dyffryn Basin & Ridge Slopes SLA) but there is no intervisibility between the two as Barry town is set on a ridge and lies between the two areas. The site does not either fall within or adjacent to a designated urban conservation area.

2.4 Landscape Character Assessments

The Special Landscape Area described above, together with others within the Vale of Glamorgan was designated as the result of a landscape assessment prepared as part of the UDP process. The assessment was based on data known as 'Landmap', a GIS system developed by the Countryside Council for Wales in conjunction with other partners. The system covers the whole of Wales and allows a location based evaluation of land in terms of a variety of factors including visual and sensory geology, history, cultural landscape, and landscape habitat.

2.5 The site falls within the 'Barry' landscape area. The Landmap classification for the site and its surroundings for visual and sensory factors is rated as '**Urban**' and the evaluation is '**Low**'.

2.6 Visual Amenity and Prominence

The site is open to view from the immediately adjacent road network (**Photograph 1**). Scrub vegetation adjacent to the eastern boundary gives some low level screening from that direction (**Photograph 2**). Distant views are possible from higher ground to the north along Dock View Road (**Photographs 5, 6, 7 and 8**). These views are all gained in the context of the Dockland as a whole with large buildings and open storage and the chemical works to the south east. The views are not constant. Vegetation adjacent to the railway line gives some screening, and progressing along the road to the north east the views become oblique and the site is difficult to identify. Views may be possible from the upper storey of the Dock office, which being on a highpoint obscures views from further west. Views from Barry Town further north are obscured by the buildings located on Dock View Road itself. Views cannot be gained from the new Millennium Way port access road due to intervening vegetation. Views cannot be gained from the railway or from Barry Dock Railway Station for the same reason (**Photograph 9**). Longer distant views can be gained from a residential road (Dyfrig Street) located on the eastern edge of Barry Island at a distance of 0.7 km. These views are gained in the context of existing industrial buildings to the west and east of the site, and the chemical works in the distance (**Photograph 10**). Views of the site from the east/south east are not possible due to intervening dockside development.

2.7 Zone of Visual influence

Figure TAG 3, attached to this report shows the photograph viewpoints described above together with a zone of visual influence (ZVI) within which views of the site may be gained. The map does not imply that views will be possible from all points within the zone due to localised screening, but it sets the outer limits of potential views.

2.8 Sensitivity of Receptors

From the baseline studies the following sensitive receptors are identified.

Landscape

The quality of the site itself in terms of ecology and visual appearance is such that it is not considered to be sensitive in respect of any change that might take place.

Visual Impact

Views from within industrial areas are not considered to be sensitive. Views from dwellings are normally considered to be sensitive though this has to be tempered with the understanding that there is no right to a view in planning law. Views from roads are not normally considered to be sensitive as they are transient in nature. Views from public footpaths are considered to be sensitive if they are used for recreational purposes or are part of the civic realm.

2.9 Baseline Projection

If the site were not to be developed it is likely to remain either in its present condition (i.e. derelict and unused) or it would be redeveloped for some form of acceptable use within the use classes order. Air photograph coverage for the site shows that it was previously used for the storage of large vehicles. The Unitary Development plan shows the site within an existing employment site and within land designated as 'Developed Coast'. The site does not fall within the area known as The Barry Waterfront which is located to the west of the site at a distance of 0.3 km. The location of this development area is identified on plan **TAG 3**. If the site remains un-used it will gradually colonise with maritime scrub vegetation.

3.0 IMPACT ASSESSMENT AND EVALUATION

3.1 Construction Phase

3.1.1 The construction phase of development would involve the clearance of the site of existing vegetation, levelling, the excavation of ground for foundations, and the construction of an industrial building with flue stack and external parking areas. It is understood that there will be no external storage. The building size is proposed to be 60x45 metres in plan and 14.08 metres to the ridge. The flue stack indicated on the application plans is 20 metres high though it is understood that this will be lower. The colour of cladding and means of enclosure of the site are as yet undetermined.

3.1.2 In landscape terms it is not anticipated that any impacts of significance will arise. This assessment is based upon the lack of any landscape features on the site worthy of retention, and its current derelict appearance.

3.1.3 In terms of visual impact, views of the construction activity including on site plant and possibly cranes will be present for a period of 12 months. Such activity might be seen from properties located on Dock View Road, but mainly from the upper floors of properties. Longer distance views would be gained from residential properties located on Barry Island. These views will be gained in the context of adjacent industrial and dock activity. Our assessment of this impact is that it will be **negligible**.

3.2 Operational Phase

3.2.1 The operational phase refers to the period after the plant has been commissioned and is actively working.

3.2.2 *Landscape Impacts*

There will be **no adverse** landscape impacts during the operational phase.

3.2.3 *Visual Impacts*

The only significant views will be views from domestic property located on Dock View Road and Dyfrid Street. The change in visual impact would amount to the introduction of a new industrial building into a highly industrialised setting. The scale of the new building would be no greater than industrial units constructed to the east of the site. The flue stack would be a maximum of 20 metres high, which is only 6 metres higher than the building itself. Views gained from the properties described would be gained in the context of substantial structures located on the dockside (**Photographs 5, 6 and 7**), and a major chemical complex with numerous tall and prominent chimneys (**Photograph 10**). The overriding element of the view is however the sea and the distant coastline of North Somerset. Even without mitigation we would assess any visual impact as **negligible** (i.e. imperceptible) assuming that the colour of the building and flue stack is appropriate to its surroundings. The flue will not emit any plume of smoke or water vapour and will cause no visual impact as the result.

3.2.4 *Impact on landscape character*

The existing character of the site and its surroundings is that of an industrial dockside landscape. It is described within the Unitary Development Plan as being within the developed coast. The proposed development is considered to be appropriate within its setting and there will be **no adverse impact** on landscape character. The site is not located within the Waterfront Regeneration area which is located to the west, and there is no inter-visibility between the two.

3.3 Mitigation

The planning application drawings show the building elevations to be coloured green though it is understood that the choice was indicative. In our opinion, given the location of the building, a palette of mid to dark grey would be more appropriate and we would recommend that the flue stack colour be graded from dark adjacent to the building to light grey above the roof line. Boundary treatments should be simple and be coloured black. On-site soft landscape is not considered necessary for screening purposes but if required to satisfy bio-diversity objectives could be achieved by simple blocks of salt tolerant native shrubs located immediately adjacent to the boundaries of the site.

3.4 Residual Impact

In our opinion the residual landscape and visual impact of the development assuming appropriate attention to building and flue stack colour would be **Major beneficial**.

APPENDIX 1

Criteria used for determining the significance of impacts

Significance of Impacts

Landscape Criteria

The following criteria were used to determine the impacts on the landscape:

1. The quality and value of existing features.
2. The ability of the landscape to absorb new features.
3. The scale and degree of change.

The significance of landscape impacts is defined as follows:

Major (positive) The proposed scheme would improve the quality of the landscape through the removal of damage caused by existing land-use and the introduction of new appropriate landscape features. It would strengthen the landscape character.

Moderate (positive) The proposed scheme would improve the quality and character and fit in well with the scale, land-form and pattern of the landscape. It would enable the restoration of valued characteristics partially lost through current and previous land uses.

Minor (positive) The proposed scheme would improve the quality of the landscape through removal of damage caused by current and previous land-use. It would fit well with the landscape character.

Negligible An imperceptible change in landscape character the proposed scheme would be absorbed into the wider landscape type and the existing landscape quality would be maintained.

Minor (adverse) The loss of only a limited amount of valuable natural features. Changes in character of very local significance. The proposed scheme would not be easily absorbed into the land-form and the scale of the landscape impacts could be fully mitigated.

Moderate (adverse) The loss of vegetation/natural features considered to be over mature or lacking visual diversity. The proposed scheme would be out of scale and not fit into local landscape patterns and land-forms. Mitigation possible.

Major (adverse) The loss of valuable mature vegetation with a life span or other natural features that cannot be replaced within a time-scale of 25 years. Proposals would be a complete variance with the land-form, scale and pattern of landscape. They would permanently degrade, diminish or destroy the integrity of valued, characteristic features, elements and/or their setting. Impacts would cause a very high quality landscape to be permanently changed and its quality diminished. The proposed scheme could not be fully mitigated and may cumulatively amount to a severe effect.

Visual Amenity Criteria

An assessment was made in terms of the significance of perceived impact by the following criteria:

1. The receptor's sensitivity and activity type. Receptors that have a greater awareness of the view such as residential occupiers and walkers will notice the introduction of new features more than those who are not absorbing the view.
2. The distance of the viewpoint from the proposed site. The greater the distance of the viewpoint from the feature the less detail is observable and it becomes more difficult to distinguish the feature from the background.
3. The duration of the perceived impact. The number of potential receptors will increase as the duration of the impact increases.
4. The scale and degree of the proposed scheme. The greater the proportion of the view that is taken up by the proposed feature the greater the impact.
5. The elevation of the proposed feature from the viewpoint. If the proposed feature is viewed against the sky then the impact will be greater than if the feature is viewed against a background.

The significance of the visual amenity impacts is defined as follows:

Major (positive) Improving visual amenity of highly sensitive receptors. Improvement of a view from recognised and important viewpoints, several public views and at close quarters.

Moderate (positive) Improvement of visual amenity of sensitive receptors at some distance.

Minor (positive) Improvement of visual amenity to a limited number of receptors or inconsequential viewpoints. A view that

would be transient in nature or the proposed scheme would only be partially seen from viewpoints.

Negligible Only a very small part of the proposed scheme would be discernable and/or at such distance that it would scarcely appreciated.

Minor (adverse) The proposed scheme constitutes only a minor component of the wider view, which might be missed by the receptor. Awareness of the proposed scheme would not have a marked effect on the overall quality of the view.

Moderate (adverse) Proposals may form a visible and recognisable new intrusive element within the overall scene and be readily noticed by receptor. Deterioration of the visual amenity to a limited number of receptors or inconsequential viewpoints. View that would be transient in nature or only partly seen from viewpoints.

Major (adverse) The proposed scheme would form an intrusive and immediately apparent part of the scene which changes and affects the entire view. Significant deterioration of visual amenity of highly sensitive receptors or deterioration to views from recognised and important viewpoints.

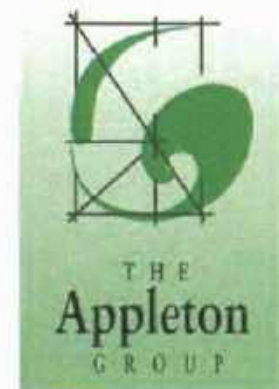


WOODHAM ROAD, BARRY

LOCATION AND CONTEXT

SCALE 1:25,000

TAG 1

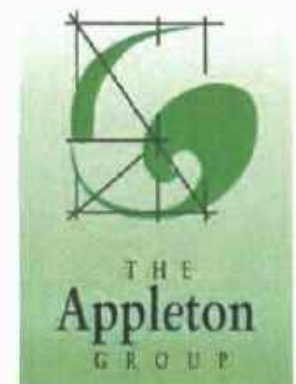


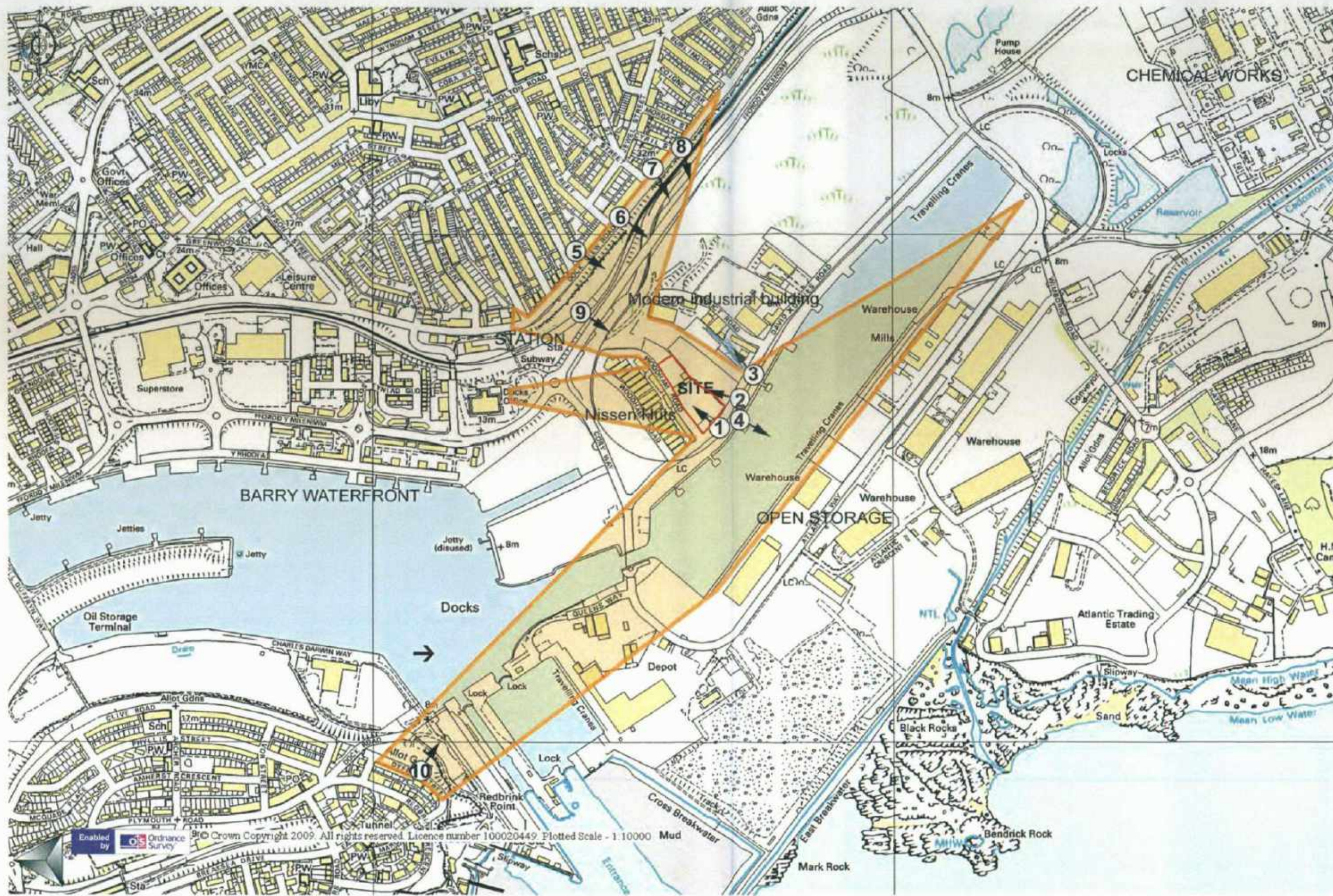


TAG 2

Land at Woodham Road, Barry

Site characteristics





KEY

Zone of visual influence

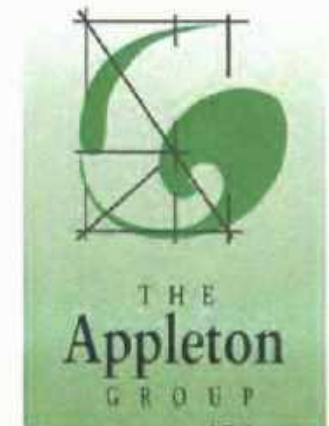


NOT TO SCALE

1 KILOMETRE

TAG 3

Land at Woodham Road, Barry Photograph locations





Photograph 1, Panorama of site from southern boundary



Photograph 2, Looking towards eastern boundary from adjacent site Photograph 3, Adjacent site to east and new industrial building



Photograph 4, Panorama of dockside south of site



Photograph 5, View of site from Dock View Road/ Castleland Street Junction



Photograph 6, View from Dock View Road near Sea View Labour Club,



Photograph 7, View from Dock View Road, Lower Pyke Street Junction



Photograph 8 View from Dock View Road, Opposite no 162



Photograph 9 View from Dock Railway Station (site not visible)



Photograph 10 View from outside number 14, Dyfrid Street, Barry Island
Site is behind Nissen Huts



Appendix 21 Environmental Noise Survey

AB acoustics

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Laurel Trading Estate
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Royton
Oldham
OL2 6LH

T : 0161 620 2828

F : 0161 626 1979

e-mail : leachabacoustics@aol.com

**Oaktree Environmental Ltd
North West Office
Unit 5
Oasis Park
Road One
Winsford Industrial Estate
Winsford
Cheshire**

**Environmental Noise Survey
Proposed Biomass Plant
Woodham Road
Barry**

**AB Acoustics
Unit 8
Laurel Trading Estate
Higginshaw Lane
Royton
Oldham**

23 December 2008.

Introduction

AB Acoustics were commissioned by Oaktree Environmental Ltd to undertake an environmental noise assessment the proposed site of the installation of a Biomass Gasification Plant to generate electricity from reclaimed wood (Woodham Road Barry CF63 4JE)

At the present time the site operates as a storage yard - - it is proposed to locate the proposed plant within a building on the existing site – it is understood the generator plant will operate on a 24 hour basis.

However this 24 hr operation will consist only of the operation of the generator plant and it is understood that no other equipment will be operated on a 24 hr basis – effectively the plant will be loaded with material for processing during the 'normal' hours that the plant operates and this material is then fed by means of a conveyor into the proposing plant.

The site is part of a well established industrial estate the proposed plant being housed within a purpose designed building.

Below is a plan of the site and the location of the nearest residential properties at which the existing background noise levels were measured:



Location 1 was on Dock View Road opposite the junction with Castleland Street.

Location 2 was at the entrance to the waste ground – which it is proposed to develop at some future date - on Cory Way

Location 3 was on the residential estate at Cei Dafydd

The noise level generated by the proposals is predicted for the residential properties at the three locations..

All calculated levels are FREE FIELD.

Noise Assessment Criteria

The likelihood of complaints about noise from industrial plant can be assessed where the standard is appropriate using BS 4142 – 1997. Within the standard, another standard, BS 8233- 1987 is introduced for general guidance on acceptable noise levels within buildings.

Guidance in BS 8233 –1987 (Sound Insulation and Noise Reduction in Buildings) provides design criteria for noise inside dwellings. These are:

Bedrooms	Laeq,T = 30 dB
Living Areas	Laeq,T = 35 to 40 dB

The 30 dB to 40dB Laeq,t level in BS 8233 – 1987 is in line with the night time internal noise criteria in PPG 24 of 30 dBA. This level is acceptable as avoiding disturbance to sleep.

An internal criteria of 35 - 40 dB Laeq,T 5 mins. Would translate to an outdoor limit of 50 - 55 dB Laeq,T 5 mins. where, by convention, an open window would provide an attenuation of 15 dBA, however an attenuation of 12 dBA is a more realistic figure.

The BS 4142 assessment method considers the likelihood of noise from specific noise sources provoking complaints from residents of nearby sensitive properties.

The Specific Noise Level is the noise level of the source or collection of sources under investigation and should exclude any other noise sources which may otherwise contribute.

The likelihood of complaints is assessed by comparing the noise level from the specific noise source(s) under investigation, against the typical prevailing background noise levels. The audible characteristics of the specific noise source(s) are also taken into account ie. If the noise contains any distinct hums, whines or bangs etc. then a correction of +5 dBA should be added to the measured level. This then becomes the Rating Level.

The margin by which the noise level due to the specific noise source under investigation exceeds the background noise level enables the likelihood of complaints to be assessed.

The greater this distance 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 background level this is a positive indication that complaints are unlikely.

Equipment Used and Measurement Method

The noise levels were measured using a :

Norsonic Type 114 real Time Octave Band Analyser (Type 1 instrument)

Calibration was carried out prior to the measurements – and checked afterwards using a ;

Norsonic Acoustic Calibrator.

The measurements were carried out at the locations described at a height of 1500mm above the ground and away from reflecting surfaces.

The measurements were undertaken at the times stated in the results.

Results

These are tabulated below for the three locations :

Location 1 Dock View Road

The main noise sources at the time of the measurements were ;

Traffic movement along Dock View Road and Ffordd y Mileniwm together with a contribution from both passenger and freight traffic on the railway

Time	L _{Aeq}	L ₉₀
18.12.08 15.30 – 16.30	62.1	55.6
Dry – westerly wind 4.3 – 5.2 m/sec – dry roads		
18.12.08 22.00 – 22.30	55.8	43.1
Dry – westerly wind 3.5 – 4.4 m/sec – damp road (Measurement time reduced due to weather conditions)		
18.12.08 23.10 – 23.20	48.0	44.9
Dry – westerly wind 2.7 m/sec – damp roads		
19.12.08 – 00.25 – 00.35	44.4	41.6

Distance from proposed site scaled at 294 m (reference Google Earth)

Location 2 Cei Dafydd

The main noise source at the time of the measurement was traffic movement along Ffordd y Mileniwm

Time	L _{Aeq}	L ₉₀
19.12.08 - 09.20 - 10.20	53.1	46.5
Dry - westerly wind 0.5m/sec - dry roads		
18.12.08 21.20 - 21.50	47.1	43.4
Dry - westerly wind 3.5 - 4.4 m/sec - damp road (Measurement time reduced due to weather conditions)		
18.12.08 23.25 - 23.35	41.4	41.2
Dry - westerly wind 2.7 m/sec - damp roads		
19.12.08 - 00.40 - 00.50	40.5	40.1

Distance from proposed site scaled at 182 m (reference Google Earth)

Location 3 Cory Way

The main noise source at the time of the measurement was traffic movement along Cory Way with cars and lorries accessing the industrial estate together with a contribution from traffic on Ffordd y Mileniwm

Time	L _{Aeq}	L ₉₀
18.12.08 - 14.15 - 15.15	60.8	53.1
Dry - westerly wind 0.5m/sec - dry roads		
18.12.08 20.45 - 21.15	47.1	43.4
Dry - westerly wind 3.5 - 4.4 m/sec - damp road (Measurement time reduced due to weather conditions)		
18.12.08 23.45 - 23.55	41.4	41.2
Dry - westerly wind 2.7 m/sec - damp roads		
19.12.08 - 00.55 - 01.05	40.5	40.1

Distance from proposed site scaled at 450 m (reference Google Earth)

Discussion of Results

These are discussed on a Location by Location basis

Internal Noise

All the proposed plant will be located internally to the proposed building - no actual measurements have as yet been undertaken on the type of plant that it is proposed to operate within the proposed building.

However the following noise levels of the various plant items are believed to be :

Engines : 85 dBA – as there are 6 of these the level will increase to $85 + 10\log 6 = 93$ dBA

Coolers : 73 dBA

Roller Mill : 90 dBA

Grinder : 120 dBA

These levels are as yet to be confirmed by the various supplies – when more detailed information is available this will be forwarded.

However the client (Sunrise Renewables Ltd) has stipulated that the general internal level in the plant must not exceed 90 dBA (this will of course mean that internal acoustic treatments etc will be required) though this may not be the case at all locations.

This is therefore the internal level that is used in the following discussion

The internal noise from the process will be radiated by the structure of the building itself.

Location 1

The residential properties at Location 1 (Dock View Road) will look down onto the proposed plant as they are elevated above the proposed site – therefore they will have a view of both the rear facade of the building and the roof.

The area of the building that faces the residential properties = $45 * 14.08 = 633.6$ sq m (rear facade)

Roof area = $60.6 * 45 = 2727$ sq m

The attenuation of the building envelope would be an $R_w = 25$ dBA (ref : www.kingspanpanels.com) for a typical trapezoidal panel – this is the figure that is used in the following calculations.

Therefore the Specific Noise Level radiated by the building can be calculated using :

Rear Facade

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Measured Level – 90 dBA

R = the sound reduction index of the building element which in this case is **25 dBA** –

see above

S = surface Area of building facing the residential property = **633.6 sq m**

r = distance to houses = **294m**

DI = Directivity Index = 3

$$L_2 = 90 - 6 - 25 + 10 \log 633.6 - 11 - 20 \log 294 + 3$$

$$L_2 = 30 \text{ (29.6) dBA}$$

Roof

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Measured Level – 90 dBA

R = the sound reduction index of the building element which in this case is **25 dBA** –
see above

S = surface Area of building facing the residential property = **2727sq m**

r = distance to houses = **294m**

DI = Directivity Index = 3

$$L_2 = 90 - 6 - 25 + 10 \log 2727 - 11 - 20 \log 294 + 3$$

$$L_2 = 36 \text{ (35.9) dBA}$$

However the residential properties are at an angle of approximately 30° to the proposed plant therefore the attenuation can be calculated from $A = 10 \log \text{angle} / 180 = 10 \log 30 / 180 = -8 \text{ (7.77)}$ – reducing the noise level radiated from the roof at Dock View Road to $36 - 8 = 28 \text{ dBA}$

The obtain the total level these two calculated levels need to be summed – $30 + 28 = 32 \text{ (32.1) dBA}$

Location 2

At the present time there is NO residential development on this site – however it is understood that there is a proposal to develop the site for residential properties – the time scale for this is unknown – if the proposed plant is installed prior to the residential development then it would seem reasonable that the possible residential development should cater for any noise that is radiated from the proposed industrial plant.

The residential properties at Location 2 (Cory Way) could only see the side facade of the proposed plant

The area of the building that faces the potential residential properties is 853.2 sq m

The attenuation of the building envelope would be an $R_w = 25 \text{ dBA}$ (ref : www.kingspanpanels.com) for a typical trapezoidal panel – this is the figure that is used in the following calculations.

Therefore the Specific Noise Level radiated by the building can be calculated using :

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Specified Level – 90 dBA

R = the sound reduction index of the building element which in this case is **25 dBA** –
see above

S = surface Area of building facing the residential property = 853.2

r = distance to houses = 182m

DI = Directivity Index = 3

$$L_2 = 90 - 6 - 25 + 10 \log 853.2 - 11 - 20 \log 182 + 3$$

$$L_2 = 35 (35.1) \text{ dBA}$$

Location 3

At the present time there is NO residential development between this location and the proposed site – however if the possible residential development does go ahead then it may be that this location will be acoustically screened from the proposed industrial site thereby attenuating the following calculated noise level.

The residential properties at Location 3 (Cie Dafydd)) at the present time see the side facade of the proposed plant

The area of the building that faces the potential residential properties 853.2sq m

The attenuation of the building envelope would be an $R_w = 25$ dBA (ref : www.kingspanpanels.com) for a typical trapezoidal panel – this is the figure that is used in the following calculations.

Therefore the Specific Noise Level radiated by the building can be calculated using :

$$L_2 = L_1 - 6 - R + 10 \log S - 11 - 20 \log r + DI$$

Where

L_2 = Calculated level at distance r metres

L_1 = Specified Level – 90 dBA

R = the sound reduction index of the building element which in this case is 25 dBA –
see above

S = surface Area of building facing the residential property = 853.2 sq m

r = distance to houses = 450m

DI = Directivity Index = 3

$$L_2 = 90 - 6 - 25 + 10 \log 853.2 - 11 - 20 \log 450 + 3$$

$$L_2 = 27 (27.2) \text{ dBA}$$

Overall Level

The predicted noise level at the various residential properties are summarised below

Location 1 = 32 dBA

Location 2 = 35 dBA

Location 3 = 27 dBA

These levels are the calculated Specific Noise Level for the various locations – with respect to BS 4142 a +5 dBA correction factor should be added to the above figures to account for the tonal character etc of the noise – therefore the resulting Rating Levels are :

Location 1 : 37 dBA

Location 2 : 40 dBA

Location 3 : 32 dBA

These are the levels that are compared to the lowest measured background (L_{90}) at the various locations :

	Difference to Rating Level
Location1 : 41.6 dBA (00.25 / 00.35)	- 4.6 dBA
Location 2 : 40.1 dBA (00.55 / 01.05)	- 0.1 dBA
Location 3 : 40.1dBA (00.40 / 00.50)	- 8.1 dBA

Therefore if the specified internal level of 90 dBA is achieved then the external level from the proposed plant at the various locations will be equal to or less than the measured background level – this is an indication that complaints about noise will not be received.

The following should be noted :

No roof lights should be fitted into the roof as these do not have as high an attenuation as the 'normal' roof panels.

If the internal level within the proposed plant is in excess of the specified 90 dBA (or is projected to be) then the attenuation of the panels forming the skin of the building must be increased to account for the increase in internal noise level – further details www.kingspanpanels.com

Roger Leach

AMIOA

Dated : 23.12.08



Tel: 01606 558633 Unit 5, Oasis Park, Road One
 Fax: 01606 861182 Winsford Industrial Estate, Winsford
 E-mail: sales@oaktree-environmental.co.uk Cheshire CW7 3RY

Title: **SITE LAYOUT PLAN**

Drawing No: **SRB/03**

Client: **Sunrise Renewables Ltd**

Site: **Woodham Road, Barry**

NGR:

Date: **5 September 2008** Scale: **1:500**

Revision: A	Printed At: A2	Drawn By: RS	Checked:
--------------------	-----------------------	---------------------	----------

KEY:

- Site Boundary
- P Parking space
- D Disabled parking space

Notes:

Revision Details:

Rev	Description	Date
-	First Draft	14/08/08
-	Application copy	05/09/08

Title: **BUILDING ELEVATIONS**

Drawing No: **SRB/04**

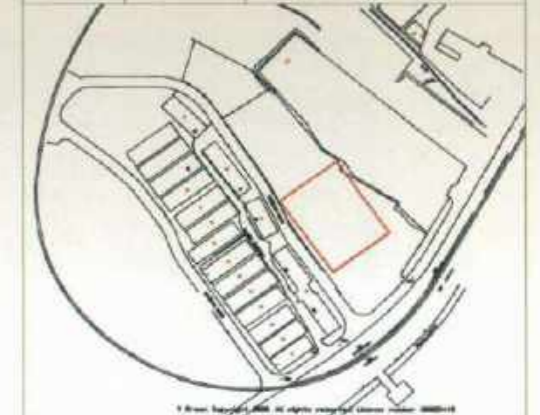
Client: **SUNRISE RENEWABLES LTD**

Site: **WOODHAM ROAD, BARRY**

NO:

Date: **29 AUGUST 2008** Scale: **1:200** Printed As: **A1**

Revision: **RS** Drawn By: **RS** Checked:

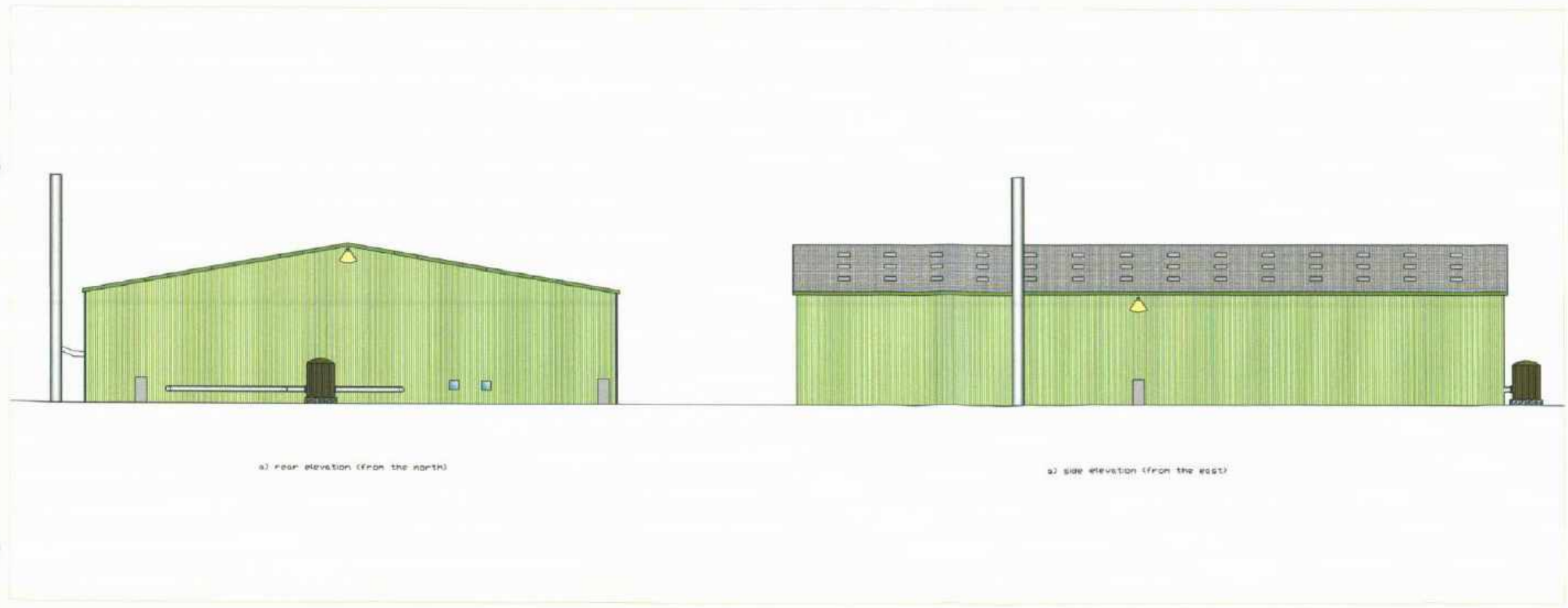
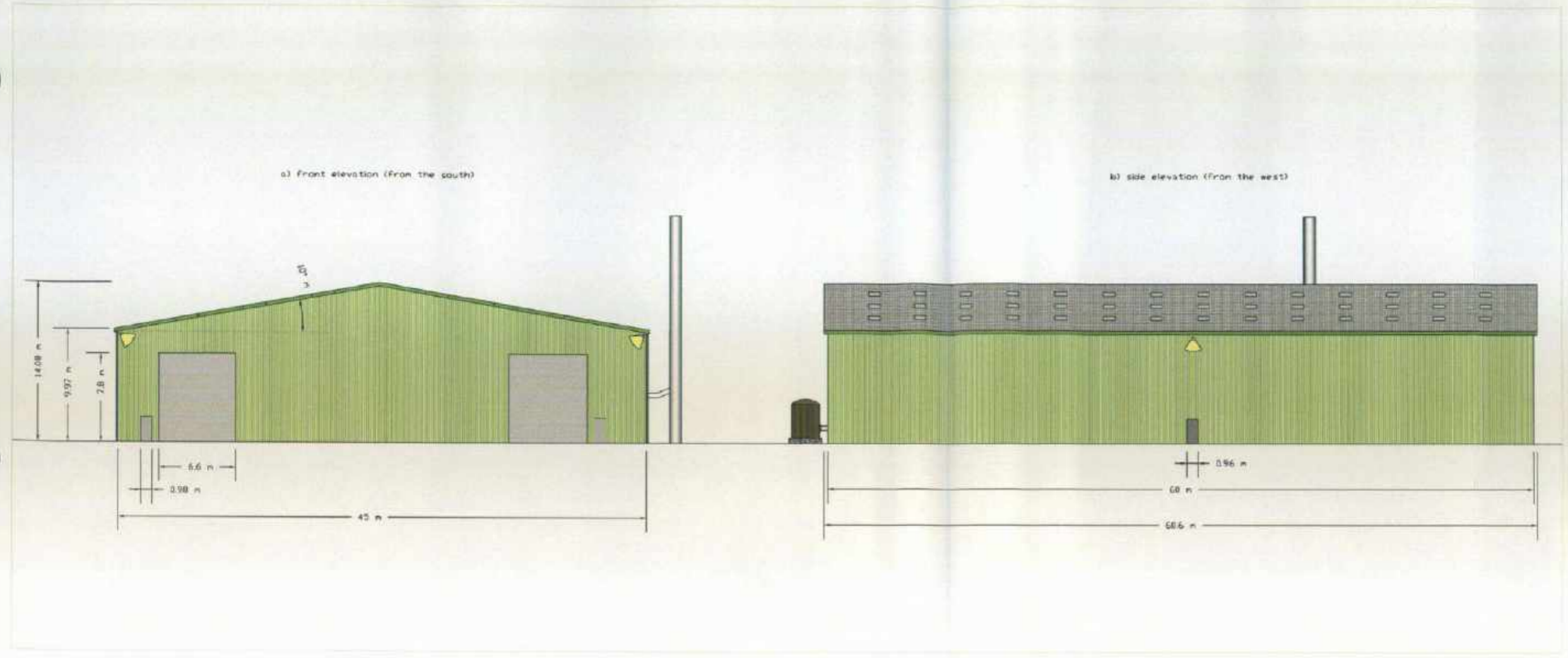


Notes:

- Building eave height = 10 m
- Building ridge height = 14.07 m
- Angle of roof pitch = 10°
- Building footprint = 60 m x 45 m
- Roller shutter doors = 6 m width x 7.5 m height
- Fire doors = 0.98 m width x 2.2 m height
- Stack height shown is 20 m which is given for indication, actual stack height will be lower

FOR CONSULTATION ONLY

Revision Details:		
Rev	Description	Date
-	First Draft	03/07/2008
A	Application Copy	29/08/2008





Appendix 22 Green Travel Plan

1.0 INTRODUCTION

1.1 Nature of business and background

1.1.1 Sunrise Renewables Limited ("Sunrise") has applied to the Vale of Glamorgan Council for planning consent to install a 9MW Biomass Plant, which will generate electricity from reclaimed wood for export to the national grid.

1.1.2 Eight new local employees will be based at the plant at Woodham Road, Barry Docks, within an established industrial area. The plant has adequate parking on site for vehicles and cycles, thereby avoiding the potential for obstructive parking on the highway.

1.1.3 The site will operate on a 24 hours basis to produce electricity but it will only receive deliveries of fuel and visits from third parties and the public during the following hours:

Monday to Friday	07:00 - 22:00
Saturday	07:00 - 20:00
Sunday / Bank / Public Holidays	07:00 - 16:00

1.1.4 The installation of the new plant will have the following environmental benefits (extract from the Planning Statement):

- i. Reduction in disposal of wood to landfill.
- ii. Additional outlet for recycled wood as a buffer against the fluctuating board mill and animal bedding market sectors for recycled wood chip.
- iii. Contributes to national and regional targets for renewable energy provision as well as providing additional energy capacity.
- iv. Contributes to reduction in carbon dioxide emissions.
- v. Supply of energy to the grid equivalent to the annual usage of approximately 22,000 households (average household consumption in the UK is 3,300kWh).
- vi. Reduction in vehicle movements to local landfill sites.
- vii. Will utilise the latest technology available for biomass energy schemes providing a source of both heat (can be used up to 1km from the site) and electricity locally (via the National Grid).

1.2 Aims and aspirations of the Travel Plan

1.2.1 The proposed Plan is designed to reflect the company's awareness of its need to promote sustainable travel, and its' responsibility in reducing the impact on the local and wider environment. It is therefore necessary for Sunrise to consider all work-related journeys, and provide a comprehensive plan for alternative travel means. As a renewable energy organisation, it is of key strategic importance to maintain sustainable activities where possible, and to minimise the environmental impact created by any part of daily working operations. The targets within this plan are for the period 2009 to 2013.

1.3 Roles and Responsibilities

- 1.3.1 The Travel Plan for the employees of Sunrise has thorough backing and approval from all senior management. Mr David Heath will be the dedicated Travel Plan co-ordinator, and will be the first point of contact for employees wishing to raise issues relating to travel arrangements. It will be the duty of the co-ordinator and other management figures to ensure commitment, whilst themselves undertaking where possible alternative travel. As the employee group will be less than ten in size, communication, monitoring and promotion of ideas can be easily managed.

2.0 OBJECTIVES AND MEASURES

- 2.1 The overall target of this Green Travel Plan is to promote, encourage and facilitate alternative travel where possible. Sunrise will refer to various policies and legislation during implementation of the Plan, including local policies.

Fig 1.0 Green Travel Plan (TP) guidance timetable

Implementation	Timing
Installation of bicycle rack/parking	Before start of operations
Set-up of Message board & hard-copy travel info	Before start of operations
Provision of travel information to individuals	At new employee induction.
Senior staff & TP Co-ordinator to meet & discuss plans	
TP Co-ordinator to present and introduce TP aims with employees	
Advise of web based page travel Info and permit access on work PCs	
Review and discussion of travel plan/ progress at staff and senior staff meetings	At monthly staff meetings
Initial formal review of TP progress, including levels of uptake and implementation of new ideas/solutions to problems encountered	6 months after commencement of TP & every 6 months after
Updating of travel information, new ideas and national travel events	Ongoing and at team meetings
Submission of new ideas/ employee to TP co-ordinator contact	
Informal TP review progress reporting/ problem solving	
Full Travel Plan review and audit, to maximize all alternative modes and subsequent uptake levels	Every 2 Years

3.0 PUBLIC TRANSPORT - RAIL AND BUS

3.1 Current facilities

3.1.1 Sunrise recognises the importance of utilizing public transport (where available) and has assessed the proximity of both rail and bus services to the proposed site. The primary source of information used was Vale of Glamorgan's Public Transport Guide for Winter 2008.

Rail: The nearest railway stations are Barry Island and Barry Dock..

Bus: The site is well served by bus routes with the nearest stop being the Civic Offices which is approximately 520 metres (570 yards) from the site i.e. 5 - 8 minute walk.

A map showing local bus and rail routes is attached as Appendix I, as well as other useful contact details. The Vale of Glamorgan's Public Transport Guide is Free and will be available to all staff on site.

3.2 Targets and Initiatives

3.2.1 The target aim of this part of the plan is to maximize public transport usage where reasonably possible. At this stage it would be unrealistic to list a specific target figure, especially where personal information such as employees' proximity to services is unknown. However, the following initiatives will be established once the employees begin:

- i. During induction of the employees, a travel pack will be issued containing maps for local bus/ rail routes and links to timetables.
- ii. A recognized and visible area of the workplace (such as the main entrance area) will be used to host travel information including timetables, route plans, the Travel Plan co-ordinators' contact details and an informative message board detailing updates, new schemes and levels of progress.
- iii. Company intranet/ website could dedicate a page to include local travel information (listing direct bus service numbers/basic route guide) with additional updated links to include other local bus and rail service information. The site can be updated as necessary with any new schemes or changes to travel information.

3.3 Funding

3.3.1 This is a low-cost option to Sunrise, where most work will simply be the maintained and clear provision of bus and rail information. Timetables, routes and additional guides can be obtained in many cases for free, from the Vale of Glamorgan website. After the initial 6-month review, schemes such as subsidizing public transport costs will be considered, depending on current levels of uptake and feasibility.

3.4 Marketing

3.4.1 The Sunrise Travel Plan will be strongly marketed at employee induction, and co-ordinator presentation meeting. Hereafter, all public transport information will be kept visible and updated on the designated 'Travel Plan message board' and possibly intranet, with the focus of discussion and idea exchange to be held during team meetings. Regular reporting of progress and active problem solving will work as a marketing tool in itself, helping to maintain awareness of the Travel Plan and encourage uptake.

4.0 CYCLING

4.1 Current facilities

4.1.1 This is probably the most cost-effective and appropriate form of low-impact travel available to the future employees of Sunrise, and alongside the obvious environmental benefit, the employees' health is also improved.

4.1.2 Overall, general cycle access is good and the proximity of rail services increases the ability for incorporated rail and cycle travel (useful for employees located further away). On site, there is space for bicycle storage and the following initiatives will help to promote travel by bicycle.

4.2 Targets and Initiatives

4.2.1 This mode of transport is likely to see increased success with good weather conditions. Therefore it is vital that positive promotion takes place immediately, in order to encourage employees out as they join the company in the Spring. Again, it would be more appropriate to aim for a non-fiscal target, and instead try to get employees cycling where reasonably possible, ensuring on-site safety. The success of this mode will be helped with:

- i. The construction of a secure covered bicycle-holding area. This is an economical way of assisting people who want to try cycling, and should be installed at the start of the Travel Plan
- ii. Offer bicycle training to those who wish to learn
- iii. At team meeting discuss the idea of government subsidized schemes (such as the Travel Wise scheme) for buying cycles and equipment
- iv. At first review (6 months) review the initiative of installing shower and changing rooms if uptake is strong
- v. Offer free high-visibility jacket to those wishing to cycle
- vii. Provide cycle route maps at designated message board area, with induction packs and by links on company website
- viii. Promote and participate where possible in national cycling events (such as bike week)

4.3 Funding

- 4.3.1 This promotion requires a variable budget which could change after initial response from employees. There is the cost of installing a bike 'shed', and sign costs for advising speed restrictions (which will be necessary as goods vehicles use the site). This is likely to be a popular way for employees to travel, and so any investment in schemes such as subsidizing cycles and equipment (with government support) should be strongly considered.

4.4 Marketing

- 4.4.1 As with public transport, there should be positive promotions carried out from induction, with clear provision of media online, on site and in discussion at team meetings. New schemes and grants will be displayed on the message board and website, with updates as necessary. The possibility of the bike-loan scheme if taken up, would give employees a sense of ownership and potentially maintain a strong routine of work-related cycling.

5.0 WALKING

5.1 Current Facilities

- 5.1.1 It is assumed that unless employees are located within 30 minutes' walking time of the site, this mode will more likely be incorporated with another, such as bus or rail.
- 5.1.2 As stated above the site is well served by bus routes with the nearest stop being the Civic Offices which is approximately 520 metres (570 yards) from the site i.e. 5 - 8 minute walk, making a combined bus/walking route the most likely option for employee travel. Lighting on site will be satisfactory and on the surrounding roads is good, with lighting along Cory Way and David Davies Road. The only area of concern is the lack of a pavement on David Davies Road. Employees can be given reflective items/clothing to ensure that they are visible on this short stretch.

5.2 Targets and Initiatives

- 5.2.1 As with cycling, this is a weather-influenced travel mode. So again it would be the target to maximize promotion as soon as employees begin, and encourage journeys by foot in good weather conditions. The target is to get employees to incorporate walking into their daily travel plan where possible. There are a number of provisions which will be made to help this promotion:
- i. Free pedometers can be given within travel pack at induction- with possible in-house challenge event to follow
 - ii. Provide walking maps at designated message board area, with induction packs and by possible links on company website
 - iii. Promote and participate where possible in national walking events (as listed on letstravelwise website and local media) and encourage lunchtime walks

5.3 Funding

- 5.3.1 As walking is a no-cost form of alternative travel, walking maps and pedometers will be provided for free. Participation in any national events would also be budget-effective, and so this transport mode is very important to the Travel Plan.

5.4 Marketing

- 5.4.1 Walking is something which the employees could easily try, even if getting to and from work involves a car, journeys such as walking to the local sandwich bar or supermarket could be made by foot. By offering pedometers, the employees are made aware of their daily number of steps, and would be encouraged to increase their totals. This would be especially effective if plans were made to hold a 'step-challenge' event, where an incentive prize could be offered to the employee with the most steps that day or week. This will be suggested and discussed at the first team meeting. As with the other modes, promotion will begin at induction and continue with visible and updated resources online, and within the message board area.

6.0 CAR PARKING/ SHARING & REDUCING EMISSIONS

6.1 Parking

- 6.1.1 At present there are sufficient car parking spaces proposed for employees, and at this stage in the Plan it would not be appropriate to remove or reduce any. This would give a negative signal to non-avoidable car users and Sunrise understands the importance of freedom of choice in traveling. Employees who independently opt to use alternative travel are a lot more likely to continue doing so, rather than those who are forced.
- 6.1.2 There is no additional outlay needed at the site as parking is a budgeted cost and any plans for sharing rides will be best arranged by word of mouth between employees where possible. At least two car parking spaces are given priority for disabled persons or other visitors.

6.2 Car Sharing

- 6.2.1 Those who have to use a car will be asked to considering car sharing (although this is limited due to the shift-work nature of the new business where only two workers will be operating at any one time). As all new employees will be provided with a travel pack, they will be able to assess how to include alternative travel into their own daily routine, and the promotion of 'car-free' days or weeks will help with this.

6.3 Reducing Emissions

- 6.3.1 At present, there are no requirements to undertake business trips, however it is noted that any off-site visits will be planned with alternative transport in mind. Similarly, there are no company vehicles (except site duty vehicles) but should the need arise, then low-impact makes and models will be considered, such as electric-powered, and potential drivers will be informed of green driving techniques at registration. As the new employees will be working shifts, this will reduce the contribution to local congestion as traveling during peak time can be avoided.
- 6.3.2 Visitors to the site will be provided with information enabling them to choose alternative travel. A map detailing surrounding major roads, rail and bus stops/services could be provided, with brief information on reaching the site from the local area. Links to more detailed travel information, traffic reporting and planning longer journeys can also be provided and updated as needed.

7.0 DETAILED MARKETING

7.1 Introduction

7.1.1 Positive promotion is vital to success of this Travel Plan, and there are various ways of communicating ideas. For this size of group, speaking could prove to be the most powerful means of publicity, but written information will not be overlooked. In addition to the marketing notes given for each method, the sections below offer more details:

7.2 Induction meeting and provision of Green Travel Pack

7.2.1 The most important marketing opportunity is at induction of new employees. A section will be dedicated to providing the Green Travel Pack (see below) and briefly explaining the contents, and importance of alternative travel within the company strategy and daily operations. This will be carried out during a one-to-one induction or within a team induction meeting.

7.2.2 Induction Travel Pack contents:

- i Local public transport route map, showing road and rail services
- ii Local cycling route map
- iii Local walking route map
- iv Pedometer to use for counting steps
- v Welcome letter, outlining the main aims of the Plan and encouraging employees to use alternative transport where possible
- vi Name and contact details for TP Co-ordinator
- vii Single sheet providing links to local travel information for timetables, traffic information and a visitor area guide.

7.3 Positive Message

7.3.1 The assigned TP co-ordinator recognizes the importance of the Plan, and of creating a good first impression towards green travel. It is vital that the induction and team presentation meeting is given with enthusiasm, and that routes for contact and enquiry are kept open and inviting.

7.3.2 From the start, an area of the main entrance/ office will be designated as the point of reference for all travel information. With the following contents:

- i Reference copies of all route maps given at induction
- ii Local (direct) bus timetable
- iii Local rail timetable
- iv Copy of single info sheet with travel links & Visitor area guide
- v TP co-ordinator contact details
- vi Guidance statement, with encouraging message, reminding employees to enquire if they have any questions, queries or ideas regarding travel.

- vii Promotion posters for related national events (when arising)
- viii Reporting of any new schemes, ideas and progress as necessary

7.3.4 At the first team meeting employees will have had time to review the contents of their Travel Pack and will probably have questions or comments. By listening to these, Sunrise will accommodate any suitable changes or new ideas that arise, and incorporate them into the Travel Plan. This will also be a good opportunity to discuss employees' own abilities for taking alternative transport, and for the TP co-ordinator to emphasize that even a small contribution can be highly beneficial to both personal health and the environment.

Program plan for meeting:

- i Confirm receipt of employees' Travel Packs
- ii Ask for initial comments or questions
- iii Generate discussion on employees' current travel arrangements and distance from work
- iv Advise of management/key players' plans to set a good example, how they will contribute in taking on green travel
- v Try to encourage employees' initial commitment by briefly discussing the possibility of future incentives, such as bike loans (the Ride2Work scheme) if uptake is good
- vi Set a possible date for events such as the pedometer 'step-challenge'
- vii Remind employees to keep an eye on the message board for upcoming events and new schemes
- viii Ask again for questions and inform employees that progress will be informally reviewed at the next team meeting (in a month or so)

7.4 Other Marketing Tactics

7.4.1 The Sunrise Green Travel Plan is designed to be flexible and adaptable in order to meet its' aims, and so as new opportunities arise, Sunrise will endeavor to incorporate them into the Plan. Reporting good progress is a key marketing strategy, as is investigating new incentive schemes. The installation of a bike shed will be the first financial investment towards the Plan, and will show Sunrises' commitment to the Plan. The possible inclusion of travel information on the company website/ intranet should also be considered if workers are permitted internet access.

7.4.2 Promoting national events, such as bike week, will bring greater awareness and meaning to the Plan, as it will involve communication outside of the company. This way, employees will be encouraged to adopt green travel into their personal routine and help the overall promotion of ideas.

8.0 MONITORING AND REVIEW

- 8.1.1 It is vital that all positive developments are reported back, as the most effective promotion is by word of mouth. Regular review during team meetings will help to monitor the Plans' success and tackle any problems which occur, enabling ongoing development and evolution. Most monitoring will take place informally, within the office, as employees react and respond to their new travel means. By encouraging new ideas and recognizing effort, a positive link between the Plan, Co-ordinator and employees will form.
- 8.1.2 At the 6-month formal review meetings, it will be the duty of the TP Co-ordinator to report progress to senior management and amend the Travel Plan where necessary. No figures will be recorded, but instead a general discussion about the level of uptake will take place. Key issues preventing people from taking alternative transport will also be raised at this point, and possible solutions generated.
- 8.1.3 It is important to recognize the alternative modes which do become successful, and to further facilitate and encourage their use. This will include discussing the installation of a shower/ changing room if employees agree it would be of use, as well as any other incentives which would help uptake. Up until, and in between management meetings, general staff meetings will be the location for informal review and monitoring. A short reminder for employees to consider green travel, and inviting comments from them will ensure the Travel Plan is kept open consistently. Brief progress reports will be included on the website and message boards.
- 8.1.4 Every two years a full travel survey and audit will be carried out. The aim of this is to undertake a major review of the Travel Plan, to ensure the key aims and objectives are being met, as well as surveying employees' travel habits and levels of uptake to alternative transport. Any changes to the company structure (such as increase in employee numbers) should be incorporated into the revised plan, with results of the employee survey and reflective comments. The survey would best be carried out by e-mail, with only a few questions to obtain data: on regularity of alternative travel types, reasons for undertaking and reasons for avoidance. The actual survey questions will be drawn up closer to the time, to best reflect the current employee situation. Before the two-year audit, there will be no figurative results to analyse, and so the most appropriate way to ensure continued effectiveness will be through discussion and debate with employees. At this stage, it is the priority for the Sunrise Green Travel Plan to remain adaptive and responsive.

APPENDIX I

Contents

- i Map - Public Transport Services in the Vale of Glamorgan
- ii Map - Public Transport Services in Barry
- iii Useful contacts
- iv Bus service guide (routes listed in detail in free guide issued by VoG)
- v Community and Disabled Transport Information
- vi Taxi information
- vii Free concessionary travel on local buses in Wales

Public Transport Services in the Vale of Glamorgan



Area covered by
The Vale of Glamorgan
Public Transport Guide

X40 X91 V5 Bus Route Network
with Service Numbers

—■— Railway line & Station
—■— Main line Station

0 5km



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Cynwgr Imlu Morgannwg nid hwydded 10002304 2008.
November 2008. Tachwedd 2008.

USEFUL CONTACTS

TRAVELINE CYMRU

All Timetable Enquiries 0871 2002233

Traveline Cymru provides public transport timetable information for all services throughout Wales.

Text for Bus Times 84268

Text the individual bus stop code to the number above to receive up to the next four buses due at that particular stop. Codes can also be found by visiting the Traveline website www.traveline-cymru.info

VALE OF GLAMORGAN COUNCIL

Contact One Vale 01446 700111

to access all Council services

AIR TRAVEL

Cardiff International Airport

Customer Relations 01446 711111

BUS & COACH TRAVEL

Bus Users UK (Wales)

All enquiries 029 20221370

Cardiff Bus

Customer Relations 029 20666444

Caring Coaches

All enquiries 01446 736295

EST Bus Ltd

Customer Relations 01446 773333

Easyway

All enquiries 01656 655655

First Cymru Buses Ltd

Customer Relations 01792 572255

Veolia Transport Cymru

Customer Relations 01443 215105

Timetable Enquiries 01443 407000

Megabus.com

0900 1600900

National Express

Reservations 08705 808080

Disabled Assistance 0121 4238479

Text Phone 0121 4550086

RAIL TRAVEL

Arriva Trains Wales

Timetable Enquiries 0845 7484950

Customer Relations 0845 6061660

Disabled Assistance 0845 3003005

Lost Property 0845 6061660

Cycling 0870 9000772

Welsh 0845 6040500

Transport Police 0800 40 50 40

Text Phone 0845 6050600

Passenger Focus (Rail) 08453 022022

COMMUNITY TRANSPORT

Dinas Powys Voluntary Concern 029 20513700

East Vale Community Transport 029 20705138

Voluntary Emergency Services 029 20490325

Transport

RHIFAU FFÔN DEFNYDDIOL

TRAVELINE CYMRU

Pob Ymholiad am Amserlenni 0871 2002233

Gall Traveline Cymru ateb eich holl gwestiynau am amserlenni trafrnidiaeth gyhoeddus yng Nghymru.

Txt am Amseroedd Bysys 84268

Anfonwch neges testun a chod eich safle bws i'r rhif uchod a chewch wybod amserau'r pedwar bws nesaf. Mae codau i'w gweld ar wefan traveline sef website www.traveline-cymru.info

CYNGOR BRO MORGANNWG

Canolfan Alwadau Un Fro 01446 700111

i gysylltu â holl wasanaethau'r cyngor.

HEDFAN

Maes Awyr Rhyngwladol Caerdydd

Llinell Cwsmeriaid 01446 711111

TEITHIO AR FWS NEU GOETS

Bus Users UK (Cymru)

Pob ymholiad 029 20221370

Bws Caerdydd

Llinell Cwsmeriaid 029 20666444

Caring Coaches

Pob ymholiad 01446 736295

EST Bus Cyf.

Llinell Cwsmeriaid 01446 773333

Easyway

Pob ymholiad 01656 655655

Bysiau First Cymru Cyf.

Llinell Cwsmeriaid 01792 572255

Veolia Transport Cymru

Llinell Cwsmeriaid 01443 215105

Ymholiadau am Amserlenni 01443 407000

Megabus.com

0900 1600900

National Express

Cadw seddi ymlaen llaw: 08705 808080

Cymorth i bobl anabl 0121 4238479

Ffôn Testun 0121 4550086

TEITHIO AR DREN

Trenau Arriva Cymru

Ymholiadau am Amserlenni 0845 7484950

Llinell Cwsmeriaid 0845 6061660

Cymorth i Bobl Anabl 0845 3003005

Eiddo Colledig 0845 6061660

Seiclo 0870 9000772

Llinell Gymraeg 0845 6040500

Heddlu Trafnidiaeth 0800 40 50 40

Ffôn Testun 0845 6050600

Passenger Focus (Reilfordd) 08453 022022

TRAFNIDIAETH GYMUNEDOL

Gwasanaeth Gwirfoddol Dinas Powys 029 20513700

Trafnidiaeth Gymunedol Dwyrain y Fro 029 20705138

Trafnidiaeth Wirfoddol ar gyfer y 029 20490325

Gwasanaethau Brys

Service Guide

Location / Lleollad

A

Aberthaw (East)
Aberthin
Amelia Trust Farm

95, 801, M1, X5, X45, X91
E11, V5
322, V5

B

Barry

Barry Island
Barry Town Centre
Bendrick
Boverton
Bridgend (Vale services only)
Broughton

88, 93, 94, 95, 96, 97, 97A, 98, 100, 322, 801, B1, B2, B2A, B3, M1, V5, X5, X45, X91 & Rail
95, 100 & Rail
88, 93, 94, 95, 96, 97, 97A, 98, 100, 322, 801, B1, B2, B2A, B3, M1, V5, X5, X45
88, 94
95, 801, M1, V2, X5, X45, X91
145, 146, V3, V4, X2
145, 801

C

Cardiff Bay (Vale services only)

Cardiff Bay Retail Park - Asda & Ikea (Vale services only)

Cardiff Bay Sports Village & Morrisons (Vale services only)
Cardiff City Centre (Vale services only)
Cardiff International Airport
City
Clawdd Coch
Cogan
Colwinston
Corntown
Cosmeston
Cowbridge
Culverhouse Cross

89, X5, (Additional Cardiff Bus service "BayCar" runs frequently from Penarth Road at the rear entrance of Cardiff Central Rail Station. Telephone Traveline 0871 200 22 33 for timetable information)
87, 89, X5, (Additional Cardiff Bus Services 9 & 9A run to this area every 15minutes from Cardiff. Telephone Traveline 0871 200 22 33 for timetable information)
87, 89
89, 92, 93, 94, 95, 96, 320, 321, 322, X2, X5, X45, X91
95, X5, X45, X91 and Airport Shuttle Bus (rail Linc tr en 905)
V3 (Divert-a-bus, on request only)
320, V5
87, 88, 89, 92, 93, 94 & Rail
V4
V4
88, 94
801, E11, V1, V2, V3, V4, V5, V6, X2
M&S/Tesco Xtra: 86, 322
A48: 803, X2
Rhur Cross: 86, 96
B&Q: 96, 322, X2
V3

Craig Penllyn

D

DARA (St Athan)
Dinas Powis
Drope Terrace
Dyffryn Gardens

95, 801, M1, V2, X5, X45, X91
86, 87, 93, 95, X5, X45 & Rail
321, 322
X2 from St Nicholas A48 bus stop

E

Eastbrook
Eglwys Brewis
Ewenny

87, 93, 95, X5, X45 & Rail
95, 801, M1, X5, X45, X91
145, 146, V4

F

Fferm Goch
Flemingston
Fonmon
Fontygary Holiday Park

V3
V2 (Divert-a-bus)
V5, (M1, X45 from Fonmon Cross)
95, M1, V5, X5, X45, X91, from bus stop on Fontygary Road outside main entrance

Arweiniad i Gwasanaeth

Local Bus Service Number / Rhif y Gwasanaeth Bysiau Lleol

Community and Disabled Transport Information

- **V.E.S.T.**

Voluntary Emergency Service Transport

Unit45, Portmanmoor Industrial Estate, Cardiff, CF24 5HB

Tel: 029 2049 0325

Provides transport provision for the elderly and people with disabilities who are unable to use local bus or train services. Service provision for the Vale of Glamorgan includes:

- A Dial-a-Bus service for 2½ days a week from anywhere in the Vale to Cardiff City Centre.
- A Saturday service from anywhere in the Vale to Barry town centre and Morrison's Store.

- **E.V.C.T.**

East Vale Community Transport

West House, Stanwell Road, Penarth, CF64 2YG

Tel: 029 2070 5138

Provides community transport provision for east Vale groups and organisations.

- **D.P.V.C.**

Dinas Powys Voluntary Concern

Community Resource Centre

Murchfield Hall, Sunnycroft Lane, Dinas Powys, CF64 4QQ

Tel: 029 2051 3700

D.P.V.C. provides a support service to individuals, groups and organisations, in particular the elderly and people with disabilities who seek to improve the quality of life. Part of this service is the provision of community transport.

Can you help?

Community Transport often relies on non-paid voluntary drivers, sometimes utilising their own cars. If you feel that you can help and would like to offer your services, please contact the schemes directly on the above telephone numbers.

Taxis - Tacsí

1 st Line Cars & Minibuses	Barry	01446 722888
A2B	Barry	01446 747500
Ace Travel	St Brides Major	01656 880622
Airport Direct	Llantwit Major	01446 793995
Andy Cars	Llantwit Major	01446 796777
B Line	Penarth	029 20711144
Bay Cars	Penarth	029 20353050
Business Class Executive Travel	Penarth	029 20703129
C J Contract Travel Services	Barry	01446 722296
Cardiff Airport Taxis	Penarth	01446 710693
Chauffeur Link	Cowbridge	01446 772094
Checker Cars Ltd	Cardiff Int. Airport	01446 711747
Cowbridge & Vale Cars	Cowbridge	01446 774714
Crystal Carz	Barry	01446 700100
Dragonride (Trike Motorbikes)	Barry	07840 760394
Gaynor Group Ltd	Airport Transfers	01446 719105
Hunts Private Hire	Rhoose	01446 719069
K-Tax	Penarth	029 20708525
Major Cars	Llantwit Major	01446 794545
Merricks PTC Ltd	Barry	01446 747684
Penarth Cars	Penarth	029 20701122
Rhoose Cars	Rhoose	01446 713916
Robert Evans	Penarth	029 20712138
Safe Cars	Barry	01446 737726
Standen's Contract Hire	Barry	01446 737519
Street Cars (Hackney Carriages)	Barry	01446 405918
Windsor Cars	Penarth	029 20700799

FREE CONCESSIONARY TRAVEL ON LOCAL BUSES IN WALES

If you fall into one of the following categories and are a resident in the Vale of Glamorgan, you are entitled to a Free Concessionary Bus Pass that entitles you to free travel on local bus services throughout Wales.

Categories of Person Eligible to Receive a Pass

1. Persons who are over the age of sixty years, or
2. Persons who are blind or partially sighted, or
3. Persons who are profoundly or severely deaf, or
4. Persons who are without speech, or
5. Persons who have a disability, or have suffered an injury, which has a substantial and long-term adverse effect on their ability to walk, or
6. Persons who do not have arms or have long-term loss of the use of both arms, or
7. Persons who have a learning disability, that is, a state of arrested or incomplete development of mind which includes significant impairment of intelligence and social functioning, or
8. Persons who would, if they applied for the grant of a licence to drive a motor vehicle under Part III of the Road Traffic Act 1988, have their applications refused pursuant to Section 92 of that Act (physical fitness) otherwise than on the grounds of persistent misuse of drugs or alcohol.
9. In addition, a pass issued to a person by virtue of 2 and 3 inclusive and who, in the opinion of the Council, requires the assistance of a companion in order to travel on eligible services, will be marked accordingly. Such passes will allow the pass holder to travel with a companion, whose purpose is to assist the pass holder, and both the pass holder and the companion will be entitled to travel at the concessionary rate.

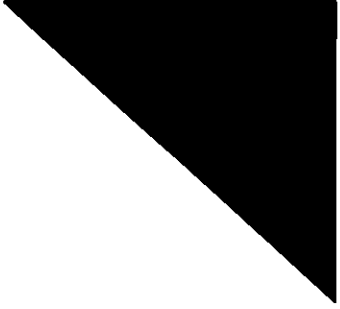
In determining whether any applicant is entitled to a concessionary pass, the Council will refer to any guidance issued by the Welsh Assembly Government or any other relevant organisation, such as the Disabled Persons Transport Advisory Committee or the Welsh Local Government Association.

**If you are eligible and resident in the Vale of Glamorgan
telephone 01446 709224 for an application form.**

**Eligible persons from other areas in Wales must contact the Councils
where they reside to apply.**



**Llywodraeth Cynulliad Cymru
Welsh Assembly Government**



Appendix 23 Transport Assessment

1.0 INTRODUCTION

- 1.1 Sunrise Renewables Limited ("Sunrise") has applied to the Vale of Glamorgan Council for planning consent to install a 9MW wood fuelled biomass plant, which will generate electricity from gas produced from reclaimed wood, for export to the national grid.
- 1.2 Eight new local employees will be based at the plant at Woodham Road, Barry Docks, within an established industrial area. The plant has adequate parking on site for vehicles and cycles and will potentially receive up to 20 HGV loads of fuel per working day, during the hours specified below, depending upon the payload of the delivery vehicles.
- 1.3 The site will operate on a 24 hours basis to produce electricity but it will only receive deliveries of fuel and visits from third parties and the public during the following hours:
- | | |
|---------------------------------|---------------|
| Monday to Friday | 07:00 - 22:00 |
| Saturday | 07:00 - 20:00 |
| Sunday / Bank / Public Holidays | 07:00 - 16:00 |
- 1.4 Facts relating to this document:
- i. The plant has a maximum fuel requirement of 216 tonnes per day.
 - ii. The bulk density of waste wood varies from approximately 240 to 520 kg/m³.
 - iii. Vehicle payloads range from 30 to 96 m³.
 - iv. The maximum gross vehicle weight permitted is 44 tonnes for an articulated vehicle, with a maximum payload of 28 tonnes. 28 tonnes equates to a volume of between 53 and 116 m³.
 - v. The applicant favours the use of walking floor trailers to deliver fuel, which reduce double handling and maximise delivery payloads. The likely payload of the walking floor trailers, taking into account varying densities, is between 20 and 25 tonnes.
 - vi. The payload stated in the application statement used a worst case scenario of 15 tonnes per load but that has been superseded by the figures above. At 20 to 25 tonnes per load the likely deliveries to the plant will be between 9 and 11 loads per day.
 - vii. 11 loads per day as the daily HGV deliveries, generating a total of 22 movements is used in this document as a worst case scenario.
- 1.5 Some fuel will be delivered by boat but it is likely that there will be periods when dockside deliveries do not occur, leaving the figures above unchanged. When deliveries by boat take place it is likely that the delivery will contain 3 days' fuel. The number of loads quoted also include the removal of materials off site as return loads, to maximise haulage efficiency.

- 1.6 Vehicle movements during the construction phase are likely to be lower than the maximum stated above. The planning application states that 8 other vehicles (employees and visitors) will arrive at/depart from the site each day, generating 16 movements. The construction phase is expected to be less than this level of usage as HGV movements will be restricted to delivery of materials and some removal of soil from the site.
- 1.7 The site is located off Woodham Road, with vehicular access from David Davies Road. Access on to the surrounding road network is gained via Cory Way onto Millenium Way. The proposed site location is within the area known as the Waterfront Strip. It is served by the A4050, A 4055 and A4231 local roads, providing links to the national network and Cardiff. These roads are identified as the Southern Corridor and Airport/M4 Corridor in the Vale of Glamorgan Local Transport Plan.

2.0 POLICY SUMMARY

2.1 The Vale of Glamorgan Local Transport Plan

2.1.1 The Local Transport Plan (2001-2006) outlines various key aims of delivering safer, less congested and less polluted roads. It also states that the development of the local economy is crucial to the continuing vitality and viability of the communities in the Vale of Glamorgan. The threats and weaknesses identified for the area include peak congestion on key routes, high (growing) car ownership and low public transport patronage. The applicant is aiming to tackle private car usage and comply with other policies in the plan by implementing a Green Travel Plan for the site (Document SRB-T). This assessment primarily considers the impact of HGV movements. The applicant has also agreed to provide funding for sustainable transport as a planning obligation.

2.1.2 The application proposals are consistent with the parking policies in the plan.

2.1.3 Policy 23 supports the transport of freight by rail and sea, where appropriate, which is relevant to the applicant's expectation that 20% of fuel will be delivered by boat. Policy 26 states that the continued use and consolidation of port facilities at Barry for freight distribution will be favoured.

2.2 UDP

2.2.1 The Councils UDP makes numerous references to the need for developments to be located where there is good existing or potential public transport. A specific policy on Strategic Public Transport adds that "Land will be protected and provision made for the development of facilities for bus operations including between

- Barry, Dinas Powys and Cardiff
- Cardiff International Airport, Barry, Wenvoe and Culverhouse Cross
- Penarth and Cardiff, and
- The Vale of Glamorgan and Bridgend"

2.2.2 The applicant supports this policy and as stated above will enter into a planning obligation to provide financial support for the local bus network. The applicant has also produce a Green Travel Plan which aims to reduce staff vehicle usage in favour of more sustainable forms of transport.

2.3 PLANNING POLICY WALES TECHNICAL ADVICE NOTE (TAN) 18: TRANSPORT

2.3.1 TAN 18 states that developments which attract substantial movements of freight should be located away from congested inner areas and residential neighbourhoods. The site will only attract an maximum of 2 loads or 4 movements per hour in any working day and is not therefore classed as substantial. The site has been chosen because of the proximity to the dock facility, the grid connection, potential fuel providers and the re-use of a brownfield site.

2.3.2 This assessment has been prepared to compliment the planning application. TAN18 suggests that the threshold for a transport assessment for industry is a gross floor area of >5,000 m², which is larger than the application building. The site in its current state is used for repair and refurbishment of containers and has no restriction on vehicle movements.

2.4 REGIONAL TRANSPORT PLAN

2.4.1 The regional transport plan contains the following priorities and objectives:

- i. To improve access to services, facilities and employment, particularly by public transport, walking and cycling.
- ii. To provide a transport system that increases the use of sustainable modes of travel.
- iii. To develop an efficient and reliable transport system with reduced levels of congestion and improved transport links
- iv. To reduce significantly the emission of greenhouse gases and air pollution from transport.
- v. To ensure that land use development in south east Wales is supported by sustainable transport measures.
- vi. To play a full role in regenerating South East Wales.
- vii. To improve access to services and facilities, particularly by public transport, walking and cycling.
- viii. To regenerate town centres, brown-field sites and local communities through appropriate transport provision.

2.4.2 The regional transport plan emphasizes and encourages the use of public transport, cycling and car sharing schemes. This emphasis is consistent with the applicant's Green Travel Plan.

3.0 TRAFFIC SURVEY

- 3.1 Traffic information for the local road network was obtained from The Vale of Glamorgan. The data arose from a traffic survey carried out on 30th September 2008 and is attached as Appendix I.
- 3.2 The 12 hour (07:00 - 19:00) total value and the HCV (Heavy Commercial Vehicle) count focusing on both directions of travel for the 2 roundabouts near the site was used to compare and determine the vehicular movement impact for the proposed development.
- 3.3 Summary of results from 5 traffic counts
- 3.3.1 Millennium Way - Dock Entrance (Wimbourne Road-A):
The traffic flow that contained the highest vehicular movement was in the Cardiff Rd to Millennium Way direction with a total of 4,942 vehicular movements of which 91 were HCV/HGVs. The count for Atlantic Way is still relevant despite the road being closed as it reveals the vehicle numbers traveling to the docks.
- 3.3.2 Millennium Way - Dock Entrance (B):
The traffic flow that contained the highest vehicular movement was in the Millennium Way to Cardiff Rd direction with a total of 5,605 vehicular movements of which 100 were HCVs.
- 3.3.3 Millennium Way - Dock Entrance (Wimbourne Road 2way):
The two way leg on the Millennium Way road was counted at 12,541 vehicle movements in the 12 hour period of which 272 were HCVs.
- 3.3.4 Millennium Way - Dock Entrance (Cardiff Road 2way):
The two way leg on the Cardiff Road was counted at 12,711 vehicle movements in the 12 hour period of which 579 were HCVs.
- 3.3.5 Millennium Way - Dock Entrance (Wimbourne Road):
The two way leg on the Docks entrance was counted at 4,158 vehicle movements in the 12 hour period of which 469 were HCVs.

3.3.6 The results of most significance are presented in the table below, with the % increase calculations using 11 vehicles i.e. 22 movements [routes labeled A-C for ease of reference]:

Route & Direction	12 hour total vehicles	increase in total vehicle nos from HCVs	increase in HCV nos	increase in HCVs & buses
A: Millenium Way - Dock Entrance (Wimbourne Road) Millennium Way leg 2 way	12,541 vehicles 272 HCVs 459 HCVs & buses	0.18%	8.08%	4.79%
B: Millenium Way - Dock Entrance (Wimbourne Road) Cardiff Road leg 2 way	12,711 vehicles 579 HCVs 757 HCVs & buses	0.17%	3.80%	2.91%
C: Millenium Way - Dock Entrance (Wimbourne Road) Docks Entrance leg 2 way	4,158 vehicles 469 HCVs 552 HCVs & buses	0.53%	4.69%	3.99%

4.0 IMPACT OF THE DEVELOPMENT

- 4.1 The application proposals are to import fuel by road between the hours of 07:00 and 22:00, which is a 15 hour day. 11 deliveries per 15 hour day would average out at one every 82 minutes. If the deliveries were restricted to the times during which the survey was carried out deliveries would average out at one every 65 minutes.
- 4.2 The overall impact in terms of additional traffic is low and the increase in heavy vehicle traffic on the 3 routes presented in the table above range from 2.91 to an 8.08 % increase in movements. The 8.08% increase would not occur as most traffic arriving at the site would arrive from the Cardiff Road direction (route B) with the impact being an increase in HCVs of 3.8%. The increase in HCVs entering/leaving the Dock would be 4.69%. These figures are reduced further if buses are added to the heavy vehicle count.
- 4.3 The majority of HCV traffic coming from Cardiff Road towards Millennium Way (route B) enters the Dock so 22 additional movements added to the existing 469 is not considered significant.
- 4.4 A Green Travel Plan has none-the-less been developed for the site and has been submitted with the planning application.
- 4.5 The applicant has already indicated that a unilateral undertaking will be signed in relation to sustainable transport contributions and would also be willing to include a traffic routing agreement to ensure vehicles adhere to agreed routes.

Millennium Way - Dock Entrance (Wimbourne Road-A)

30th September, 2008

Cardiff Rd to Millennium Way(2to1)
 Dock Entrance to Millennium Way(3to1)
 Millennium Way to Dock Entrance(1to3)



CARS cars
 LCV light commercial vehicles
 MCV medium commercial vehicles
 HCV 2 AXLE heavy commercial vehicles - 2 axle
 HCV 3 AXLE heavy commercial vehicles - 3 axle
 HCV 4+ AXLE heavy commercial vehicles - 4 plus axles
 BUSES buses
 MOTOR CYCLES motor cycles
 CYCLES cycles - count NOT included in vehicle TOTALS

SITE	Millennium Way - Dock Entrance (Wimbourne Road-A)	DATE:	30/09/08
DIR	Cardiff Rd to Millennium Way(2to1)	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (Wimbourne Road-A)	DATE:	30/09/08
DIR	Dock Entrance to Millennium Way(3to1)	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (Wimbourne Road-A)	DATE:	30/09/08
DIR	Millennium Way to Dock Entrance(1to3)	DAY	Tuesday

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	47	7	1	1	0	0	5	0	0	61
7.30	31	8	1	0	0	2	1	0	0	41
7.45	51	6	0	0	0	1	1	1	0	60
8.00	74	13	0	1	0	0	0	0	0	88
8.15	84	21	1	3	1	0	0	1	1	111
8.30	115	17	3	1	0	2	1	2	0	141
8.45	103	7	2	0	0	1	7	1	0	121
9.00	96	16	2	1	0	0	6	0	0	121
9.15	93	9	2	1	0	1	4	0	0	110
9.30	137	17	3	2	0	2	5	0	1	166
10.00	165	13	2	2	0	2	3	0	0	187
10.30	144	21	6	0	1	0	3	0	0	175
11.00	143	10	3	1	0	2	0	1	0	160
11.30	162	11	5	1	2	4	0	0	0	185
12.00	142	10	5	5	0	4	3	1	0	170
12.30	173	10	6	2	2	3	4	1	0	203
13.00	167	24	0	3	0	3	6	0	0	217
13.30	186	23	1	4	0	0	3	1	0	218
14.00	171	25	1	2	1	3	0	1	0	204
14.30	162	27	0	3	0	1	2	0	2	195
15.00	171	16	2	1	0	1	1	0	0	192
15.30	209	19	5	1	1	3	3	0	0	241
16.00	112	13	4	1	0	2	5	1	1	136
16.15	119	10	1	0	0	0	5	4	1	135
16.30	110	8	1	0	0	0	1	3	1	123
16.45	142	6	1	1	0	1	3	2	0	156
17.00	161	6	0	0	0	1	3	0	2	171
17.15	126	4	1	1	1	0	2	0	0	137
17.30	158	3	0	1	1	1	0	1	0	145
17.45	126	3	1	0	0	0	0	0	0	132
18.00	231	14	1	0	0	1	3	2	1	252
18.30	177	5	1	0	0	1	1	0	3	186

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	7	0	0	0	0	0	0	1	0	8
7.30	7	0	0	0	0	0	1	0	0	8
7.45	12	1	1	1	0	0	0	0	0	15
8.00	13	2	1	1	0	0	0	0	0	17
8.15	7	7	0	0	0	0	1	0	0	15
8.30	12	5	0	0	0	2	0	0	0	19
8.45	14	5	2	1	0	0	0	1	0	23
9.00	14	3	0	0	0	0	1	0	0	18
9.15	10	8	1	0	0	1	3	0	0	23
9.30	18	7	1	1	0	3	1	0	0	31
10.00	31	6	0	2	0	0	0	0	0	39
10.30	19	5	1	2	0	1	0	0	0	28
11.00	12	11	1	0	0	2	1	0	0	27
11.30	18	4	3	0	0	0	0	0	0	25
12.00	27	3	2	1	0	0	0	0	0	33
12.30	32	7	1	1	1	2	0	0	0	44
13.00	24	7	0	1	0	0	0	0	0	32
13.30	29	10	0	2	1	1	1	0	0	44
14.00	22	8	2	0	0	3	1	0	0	33
14.30	28	6	1	0	1	0	0	2	0	38
15.00	50	11	1	0	0	0	0	2	0	64
15.30	31	10	1	0	0	1	1	0	0	44
16.00	30	2	0	0	0	1	0	0	0	33
16.15	30	4	1	0	0	0	1	0	1	36
16.30	38	3	1	0	0	1	1	0	0	44
16.45	23	3	0	0	0	0	0	1	0	27
17.00	47	3	1	1	0	0	0	0	1	52
17.15	33	4	0	0	0	0	1	1	0	38
17.30	17	1	1	0	0	0	0	0	0	19
17.45	27	0	1	0	0	0	0	0	1	28
18.00	11	1	1	0	0	0	0	0	1	13
18.30	9	0	0	0	0	0	0	0	0	9

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	38	7	3	0	0	0	1	0	2	49
7.30	40	10	1	0	0	0	1	0	1	52
7.45	53	9	2	0	0	1	7	1	0	73
8.00	47	9	6	0	0	1	0	0	0	63
8.15	55	12	0	1	0	0	0	0	0	68
8.30	43	4	0	0	0	0	1	0	0	48
8.45	29	2	0	1	0	1	1	0	0	34
9.00	21	9	0	0	0	0	1	0	0	31
9.15	17	5	1	0	1	0	2	0	0	29
9.30	22	15	1	0	0	1	0	0	0	39
10.00	18	5	1	1	0	1	0	0	0	26
10.30	23	8	1	0	0	0	1	0	0	33
11.00	25	2	3	1	1	0	0	0	0	32
11.30	16	10	1	0	0	1	0	0	0	28
12.00	25	4	2	1	0	2	0	0	1	34
12.30	28	2	0	3	0	1	0	1	0	35
13.00	30	8	0	3	1	4	1	0	0	47
13.30	22	10	2	2	0	2	1	2	0	41
14.00	22	12	1	0	1	0	1	1	0	38
14.30	17	5	0	0	1	3	1	0	0	27
15.00	23	6	1	1	0	1	1	2	0	37
15.30	37	10	3	1	0	0	0	2	0	53
16.00	11	1	1	2	0	0	0	0	0	15
16.15	13	4	0	1	0	1	0	0	0	19
16.30	12	2	1	0	0	1	0	0	0	16
16.45	14	2	1	0	0	0	1	0	0	18
17.00	16	1	0	0	0	0	1	0	0	18
17.15	12	2	0	0	0	1	0	0	0	15
17.30	16	3	0	0	0	0	0	0	0	19
17.45	4	3	0	1	0	0	0	0	0	8
18.00	7	2	0	0	0	0	0	0	0	9
18.30	11	1	0	0	0	0	0	0	0	12

PK 800 - 0900	376	58	6	5	1	3	8	4	0	461
PK 1636-1736	541	24	3	2	1	2	9	5	3	587
2 HR AM PK	647	95	11	7	1	7	20	8	1	793
2 HR PM PK	1634	53	9	4	2	5	19	11	5	1137
12 HOUR TOTAL	4288	401	64	39	10	42	75	23	13	4942
% OF TOTAL	86.77	8.11	1.30	0.79	0.20	0.85	1.52	0.47	---	100

46	19	3	2	0	2	1	1	0	74
141	13	2	1	0	1	2	2	1	162
89	31	5	3	0	3	6	1	0	138
245	20	5	1	0	2	3	2	3	278
702	144	25	14	3	18	14	8	4	928
75.65	15.52	2.69	1.51	0.32	1.94	1.51	0.86	---	100

174	27	6	2	0	2	2	0	0	213
54	7	2	0	0	2	2	0	0	67
305	63	10	2	1	3	13	1	1	398
98	16	3	4	0	3	2	0	0	128
797	190	32	19	5	22	22	9	4	1066
71.95	17.82	3.08	1.78	0.47	2.66	2.06	0.84	---	100

Millennium Way - Dock Entrance (B)

30th September, 2008

Dock Entrance to Cardiff Road(3to2)
 Cardiff Road to Dock Entrance(2to3)
 Millennium Way to Cardiff Road(1to2)



CARS cars
 LCV light commercial vehicles
 MCV medium commercial vehicles
 HCV 2 AXLE heavy commercial vehicles - 2 axle
 HCV 3 AXLE heavy commercial vehicles - 3 axle
 HCV 4+ AXLE heavy commercial vehicles - 4 plus axles
 BUSES buses
 MOTOR CYCLES motor cycles
 CYCLES cycles - count NOT included in vehicle TOTALS

SITE	Millennium Way - Dock Entrance (B)	DATE	30/09/08
DIR	Dock Entrance to Cardiff Road(3to2)	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (B)	DATE	30/09/08
DIR	Cardiff Road to Dock Entrance(2to3)	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (B)	DATE	30/09/08
DIR	Millennium Way to Cardiff Road(1to2)	DAY	Tuesday

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	12	4	0	2	0	9	2	0	2	25
7.30	3	2	0	0	0	2	1	0	1	8
7.45	9	3	0	4	0	2	1	0	0	19
8.00	6	0	0	2	0	3	0	0	0	11
8.15	6	4	1	2	1	1	0	0	0	15
8.30	3	4	1	0	0	3	0	0	0	11
8.45	4	2	1	2	2	4	0	0	1	15
9.00	9	11	0	2	0	5	0	0	0	27
9.15	7	7	3	2	1	6	0	0	0	26
9.30	15	14	3	1	0	6	0	0	0	39
10.00	19	17	2	4	2	8	1	0	0	53
10.30	22	19	6	1	0	7	0	0	0	55
11.00	21	4	5	2	1	3	0	0	0	36
11.30	30	8	5	2	3	5	1	0	0	54
12.00	38	7	3	2	0	9	2	0	0	57
12.30	31	6	5	1	2	7	0	0	0	52
13.00	26	17	1	2	1	8	0	0	1	55
13.30	15	6	0	1	1	11	2	0	0	36
14.00	15	12	4	3	1	7	0	0	0	42
14.30	23	9	0	2	1	8	4	0	0	47
15.00	32	9	2	0	0	7	0	1	0	51
15.30	30	20	1	1	3	8	1	0	1	64
16.00	24	4	0	0	0	1	0	0	0	29
16.15	45	6	0	1	0	9	0	0	0	58
16.30	36	8	1	0	0	2	0	0	0	47
16.45	23	6	0	1	0	1	0	1	0	32
17.00	34	2	0	1	0	4	0	0	2	41
17.15	32	9	2	6	0	1	1	0	1	45
17.30	21	4	0	0	1	0	0	1	0	27
17.45	27	5	0	0	1	1	0	1	0	35
18.00	23	0	1	0	0	0	0	0	2	24
18.30	17	1	1	0	0	0	1	0	2	20

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	61	23	0	1	2	4	1	0	4	92
7.30	29	9	2	2	1	2	0	0	3	45
7.45	40	18	3	2	1	2	0	1	5	67
8.00	30	18	1	1	1	1	1	0	0	51
8.15	24	14	1	1	0	1	0	0	0	41
8.30	13	8	2	0	0	3	0	0	1	26
8.45	20	10	1	2	1	7	0	0	0	41
9.00	12	3	4	1	1	6	3	0	0	32
9.15	17	9	0	0	0	1	0	0	0	27
9.30	15	12	1	2	0	7	1	0	0	38
10.00	26	5	1	3	0	4	0	0	0	39
10.30	28	7	2	1	0	5	0	0	0	43
11.00	22	7	0	0	1	11	0	0	0	41
11.30	19	11	5	2	0	6	1	0	0	44
12.00	12	7	2	3	0	8	0	0	0	32
12.30	16	5	2	1	1	9	0	0	0	36
13.00	30	19	1	2	0	7	0	0	0	59
13.30	19	11	1	3	1	8	0	0	1	43
14.00	17	5	4	2	1	4	1	0	0	34
14.30	10	5	4	2	1	6	1	0	0	29
15.00	20	7	2	2	0	7	0	0	0	38
15.30	17	4	0	1	0	7	0	0	0	29
16.00	4	0	0	1	0	3	0	0	0	8
16.15	6	0	0	0	0	3	1	0	0	12
16.30	4	3	0	0	0	1	0	0	0	8
16.45	17	2	0	1	0	1	0	0	0	21
17.00	8	1	0	0	0	1	0	0	0	10
17.15	2	1	0	1	0	2	0	0	0	6
17.30	5	0	0	1	0	1	0	0	0	7
17.45	6	0	0	1	0	2	0	0	0	9
18.00	4	0	0	0	0	1	0	0	0	5
18.30	9	1	0	1	0	0	0	0	0	11

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	182	30	2	2	0	2	7	1	1	228
7.30	104	10	0	1	0	1	4	2	0	122
7.45	110	13	1	1	1	0	2	1	1	129
8.00	103	13	0	0	0	2	2	1	0	121
8.15	116	12	1	0	0	1	2	0	2	132
8.30	113	10	2	2	0	1	1	3	0	132
8.45	98	8	1	1	0	2	1	0	1	111
9.00	114	14	2	1	0	1	0	1	1	133
9.15	95	12	1	4	0	2	0	0	0	114
9.30	173	13	3	1	3	3	3	0	1	199
10.00	188	20	4	1	0	2	3	0	0	218
10.30	194	18	3	3	1	0	3	0	0	220
11.00	202	15	2	3	1	2	8	1	0	234
11.30	204	9	0	1	0	1	2	1	0	218
12.00	200	22	3	2	1	3	3	2	1	236
12.30	223	10	5	0	0	3	1	1	0	244
13.00	204	19	2	6	0	4	3	2	0	240
13.30	211	23	5	7	1	0	5	1	0	253
14.00	206	24	2	3	0	1	3	0	0	239
14.30	228	25	1	2	0	2	12	0	0	270
15.00	237	24	3	2	0	0	5	0	1	272
15.30	218	21	1	2	0	4	1	0	1	247
16.00	121	15	3	4	0	0	0	0	1	143
16.15	111	3	1	0	0	0	0	1	0	116
16.30	133	3	2	0	0	4	1	0	0	143
16.45	123	9	0	0	0	0	2	0	0	130
17.00	181	9	2	0	0	0	0	2	2	174
17.15	101	2	0	0	0	0	0	0	0	103
17.30	117	9	1	0	0	1	0	0	0	124
17.45	102	2	0	0	0	1	0	2	1	107
18.00	133	2	1	0	0	0	0	0	0	136
18.30	112	6	0	0	0	0	1	0	0	119

PK 800 - 8900	19	18	3	6	3	11	0	0	0	52
PK 1636-1730	125	25	3	2	0	8	1	1	3	165
2 HR AM PK	47	53	6	14	4	26	2	0	2	132
2 HR PM PK	242	44	3	3	2	16	1	3	3	314
12 HOUR TOTAL	638	230	48	41	21	141	17	4	13	1140
% OF TOTAL	55.96	20.18	4.21	3.60	1.84	12.37	1.49	0.35	---	100

PK 800 - 8900	87	48	5	4	2	12	1	0	1	159
PK 1636-1730	31	7	0	2	0	5	0	0	0	45
2 HR AM PK	185	87	14	9	5	25	4	1	9	330
2 HR PM PK	54	7	0	5	0	14	1	0	0	81
12 HOUR TOTAL	566	223	39	40	12	133	10	1	14	1024
% OF TOTAL	55.27	21.78	3.81	3.91	1.17	12.99	0.98	0.10	---	100

PK 800 - 8900	430	43	4	3	8	6	5	4	3	496
PK 1636-1730	518	19	4	0	0	4	3	2	2	550
2 HR AM PK	853	92	8	10	1	10	12	8	5	994
2 HR PM PK	989	44	9	4	0	6	3	5	4	1040
12 HOUR TOTAL	4937	415	55	49	8	43	76	22	14	5605
% OF TOTAL	88.08	7.40	0.98	0.87	0.14	0.77	1.38	0.39	---	100

Millennium Way - Dock Entrance (Wimbourne Road)

30th September, 2008

To Millennium Way
From Millennium Way
Millennium Way leg 2way



CARS cars
LCV light commercial vehicles
MCV medium commercial vehicles
HCV 2 AXLE heavy commercial vehicles - 2 axle
HCV 3 AXLE heavy commercial vehicles - 3 axle
HCV 4+ AXLE heavy commercial vehicles - 4 plus axle
BUSES buses
MOTOR CYCLES motor cycles
CYCLES cycles - coast NOT included in vehicle TOTALS

SITE	Millennium Way - Dock Entrance (Wimbourne Road)	DATE	30/09/08
DIR	To Millennium Way	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (Wimbourne Road)	DATE	30/09/08
DIR	From Millennium Way	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (Wimbourne Road)	DATE	30/09/08
DIR	Millennium Way leg 2way	DAY	Tuesday

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	54	7	1	1	0	0	5	1	0	60
7.30	38	6	1	0	0	2	2	0	0	49
7.45	63	7	1	1	0	1	1	1	9	75
8.00	67	15	1	2	0	0	0	0	0	105
8.15	91	28	1	3	1	0	1	1	1	126
8.30	127	22	3	1	0	4	1	2	0	160
8.45	117	12	4	1	0	1	7	2	0	144
9.00	150	19	2	1	0	0	7	0	0	139
9.15	103	17	3	1	0	2	7	0	0	133
9.30	155	24	4	3	0	5	6	0	1	197
9.45	196	19	2	4	0	2	3	0	0	226
10.00	163	26	7	2	1	1	3	0	0	203
10.15	155	21	4	1	0	4	1	1	0	187
10.30	189	15	8	1	2	4	0	0	0	210
10.45	189	13	7	6	0	4	3	1	0	203
11.00	205	17	9	3	3	5	4	1	0	247
11.15	211	31	0	4	0	3	0	0	0	249
11.30	215	33	1	8	1	1	4	1	0	262
11.45	193	30	3	2	1	6	1	1	0	237
12.00	190	33	1	3	1	1	2	2	2	233
12.15	221	27	3	1	0	1	1	2	0	256
12.30	240	29	6	1	1	4	4	0	0	285
12.45	142	15	4	1	0	3	5	1	1	171
13.00	145	14	2	0	0	0	6	4	2	171
13.15	148	11	2	0	0	1	2	3	1	167
13.30	165	9	1	1	0	1	3	3	0	183
13.45	208	9	1	1	0	1	3	0	3	223
14.00	161	6	1	1	1	0	3	1	0	178
14.15	155	4	1	1	1	1	0	1	0	164
14.30	155	3	2	0	0	0	0	0	1	160
14.45	242	15	2	0	0	1	3	2	2	265
15.00	165	5	1	0	0	1	1	0	3	195

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	220	37	5	2	0	2	8	1	3	275
7.30	144	20	1	1	0	1	5	2	1	174
7.45	163	22	3	1	1	1	9	2	1	202
8.00	150	22	6	0	0	3	2	1	0	184
8.15	171	24	1	1	0	1	2	0	2	200
8.30	156	14	2	2	0	1	2	3	0	180
8.45	127	10	1	2	0	3	2	0	1	145
9.00	135	23	2	1	0	1	1	1	1	164
9.15	112	20	2	4	1	2	2	0	0	143
9.30	195	28	4	1	3	4	3	0	1	238
9.45	206	25	5	2	0	3	3	0	0	244
10.00	217	24	4	3	1	0	4	0	0	253
10.15	227	17	5	4	2	2	8	1	0	266
10.30	220	19	1	1	0	2	2	1	0	246
10.45	225	26	5	3	1	5	3	2	2	270
11.00	251	12	6	3	0	4	1	2	0	279
11.15	234	27	2	9	1	6	4	2	0	287
11.30	233	33	7	9	1	2	6	3	0	294
11.45	228	36	3	3	1	1	4	1	0	277
12.00	245	30	1	2	1	5	13	0	0	297
12.15	260	32	4	3	0	1	7	2	1	308
12.30	255	31	4	3	0	4	1	2	1	300
12.45	132	16	4	6	0	0	0	0	1	158
13.00	124	7	1	1	0	1	0	1	0	135
13.15	145	5	3	0	0	5	1	0	0	159
13.30	137	7	1	0	0	0	3	0	0	148
13.45	177	10	2	0	0	0	1	2	2	192
14.00	113	4	0	0	0	1	0	0	0	118
14.15	133	8	1	0	0	1	0	0	0	143
14.30	106	5	0	1	0	1	0	2	1	115
14.45	140	4	1	0	0	0	0	0	0	145
15.00	123	7	0	0	0	0	1	0	0	131

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	274	44	6	3	0	2	13	2	3	344
7.30	182	26	2	1	0	3	7	2	1	223
7.45	226	29	4	2	1	2	10	3	1	277
8.00	237	37	7	2	0	3	2	1	0	289
8.15	262	52	2	4	1	1	3	1	3	326
8.30	283	36	5	3	0	5	3	5	0	340
8.45	244	22	5	3	0	4	0	2	1	289
9.00	245	42	4	2	0	1	8	1	1	303
9.15	215	37	5	5	1	4	9	0	0	278
9.30	350	52	8	4	3	9	9	0	2	435
9.45	402	44	7	6	0	5	6	0	0	470
10.00	380	50	11	5	2	1	7	0	0	456
10.15	362	38	0	5	2	6	0	2	0	453
10.30	400	34	9	2	2	6	2	1	0	456
10.45	354	39	12	9	1	9	6	3	2	473
11.00	458	29	15	6	0	9	5	3	0	526
11.15	445	56	2	13	1	11	4	2	0	536
11.30	448	66	8	15	2	3	10	4	0	556
11.45	421	68	6	5	2	7	5	2	0	514
12.00	435	63	2	5	2	6	15	2	2	530
12.15	481	59	7	4	0	2	8	4	1	565
12.30	495	60	10	4	1	8	5	2	1	565
12.45	274	31	8	7	0	3	5	1	2	329
13.00	269	21	3	1	0	1	0	5	2	306
13.15	293	16	5	0	0	6	3	3	1	326
13.30	302	16	2	1	0	1	6	3	0	331
13.45	365	19	3	1	0	1	4	2	5	415
14.00	274	12	1	1	1	1	3	1	0	294
14.15	268	12	2	1	1	2	0	1	0	307
14.30	261	8	2	1	0	1	0	2	2	275
14.45	382	19	3	0	0	1	3	2	2	410
15.00	309	13	1	0	0	1	2	0	3	326

PK 090 - 0900	422	77	9	7	1	5	9	5	0	535
PK 1630-1730	662	37	5	3	1	3	11	7	4	749
2 HR AM PK	736	126	16	10	1	10	26	6	1	931
2 HR PM PK	1279	73	14	5	2	7	22	13	8	1415
12 HOUR TOTAL	4990	545	89	53	13	60	89	31	17	5870
% OF TOTAL	85.01	9.28	1.52	0.90	0.22	1.02	1.52	0.53	---	100

PK 090 - 0900	804	70	10	5	0	8	8	4	3	709
PK 1630-1730	672	26	6	0	0	6	5	2	2	617
2 HR AM PK	1158	155	18	12	2	13	25	5	6	1392
2 HR PM PK	1067	62	12	8	0	9	5	5	4	1188
12 HOUR TOTAL	5704	605	87	66	13	65	98	31	18	6671
% OF TOTAL	85.50	9.07	1.30	1.02	0.19	0.97	1.47	0.46	---	100

PK 090 - 0900	1026	147	19	12	1	13	17	9	4	1244
PK 1630-1730	1254	63	11	3	1	9	16	9	6	1366
2 HR AM PK	1894	281	34	22	3	23	51	15	7	2323
2 HR PM PK	2346	135	28	13	2	16	27	18	12	2583
12 HOUR TOTAL	10694	1150	176	121	26	125	187	62	35	12541
% OF TOTAL	85.27	9.17	1.40	0.96	0.21	1.00	1.49	0.49	---	100

Millennium Way - Dock Entrance (Wimbourne Road)

30th September, 2008

To Cardiff Road
From Cardiff Road
Cardiff Road leg 2way



CARS cars
LCV light commercial vehicles
MCV medium commercial vehicles
HCV 2 AXLE heavy commercial vehicles - 2 axle
HCV 3 AXLE heavy commercial vehicles - 3 axle
HCV 4+ AXLE heavy commercial vehicles - 4 plus axles
BUSES buses
MOTOR CYCLES motor cycles
CYCLES cycles - count NOT included in vehicle TOTALS



SITE	Millennium Way - Dock Entrance (Wimbourne Road)	DATE:	30/09/08
DIR	To Cardiff Road	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (Wimbourne Road)	DATE:	30/09/08
DIR	From Cardiff Road	DAY	Tuesday

SITE	Millennium Way - Dock Entrance (Wimbourne Road)	DATE:	30/09/08
DIR	Cardiff Road leg 2way	DAY	Tuesday

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	194	34	2	4	0	11	9	1	3	255
J 7.30	107	12	0	1	0	3	5	2	1	130
AJ 7.45	119	16	1	5	1	2	3	1	1	148
MJ 8.00	106	13	0	2	0	5	2	1	0	132
PI 8.15	122	16	2	2	1	2	2	0	2	147
EJ 8.30	116	14	3	2	0	4	1	3	0	143
AJ 8.45	102	10	2	3	2	6	1	0	2	126
KJ 9.00	123	25	2	3	0	6	0	1	1	160
I 9.15	102	19	4	6	1	8	0	0	0	140
9.30	186	27	6	2	3	9	3	0	1	238
10.00	207	37	6	5	2	10	4	0	0	271
10.30	216	35	9	4	1	7	3	0	0	275
11.00	223	19	7	5	2	5	8	1	0	270
11.30	234	17	5	3	3	6	3	1	0	272
12.00	218	29	6	4	1	8	5	2	1	273
12.30	254	16	11	1	2	10	1	1	0	296
13.00	230	36	3	8	1	12	3	2	1	295
13.30	226	29	5	6	2	11	7	1	0	289
14.00	221	36	6	6	1	8	3	0	0	281
14.30	251	34	1	4	1	10	16	0	0	317
15.00	269	33	6	2	0	7	6	1	1	323
15.30	248	41	2	3	3	12	2	0	2	311
J 16.00	145	19	3	4	0	1	0	0	1	172
PI 16.15	154	9	1	1	0	6	0	1	0	174
MJ 16.30	169	11	3	0	0	6	1	0	0	190
PI 16.45	145	11	0	1	0	1	2	1	0	162
EJ 17.00	195	11	2	1	0	4	0	2	4	215
AJ 17.15	133	11	2	0	0	1	1	0	1	148
KJ 17.30	138	9	1	0	1	1	0	1	0	151
I 17.45	129	7	0	0	1	2	0	3	1	142
18.00	156	2	2	0	0	0	0	0	2	160
18.30	129	7	1	0	0	0	2	0	2	139

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	106	30	1	2	2	4	6	0	4	153
J 7.30	60	16	3	2	1	4	1	0	3	86
AJ 7.45	91	24	3	2	1	3	1	2	5	127
MJ 8.00	104	29	1	2	1	1	1	0	0	139
PI 8.15	108	35	2	4	1	1	0	1	1	152
EJ 8.30	126	25	5	1	0	5	1	2	1	167
AJ 8.45	123	17	3	2	1	6	7	1	0	162
KJ 9.00	106	19	6	2	1	6	9	0	0	153
I 9.15	110	18	2	1	0	2	4	0	0	137
9.30	152	29	4	4	0	9	6	0	1	204
10.00	191	18	3	5	0	6	3	0	0	226
10.30	172	26	6	1	1	5	3	0	0	218
11.00	165	17	3	1	1	13	0	1	0	201
11.30	161	22	10	3	2	10	1	0	0	229
12.00	154	17	7	8	0	12	3	1	0	202
12.30	191	15	10	3	3	12	4	1	0	239
13.00	217	43	1	5	0	10	0	0	0	276
13.30	205	34	2	7	1	8	3	1	1	261
14.00	168	30	5	4	2	7	1	1	0	238
14.30	172	32	4	5	1	7	3	0	2	224
15.00	191	23	4	3	0	8	1	0	0	250
15.30	226	23	5	2	1	10	3	0	0	270
J 16.00	116	13	4	2	0	5	5	1	1	146
PI 16.15	123	10	1	0	0	3	6	4	1	147
MJ 16.30	114	11	1	0	0	1	1	3	1	131
PI 16.45	169	6	1	2	0	2	3	2	0	177
EJ 17.00	160	7	0	0	0	2	3	0	2	161
AJ 17.15	130	5	1	2	1	2	2	0	0	143
KJ 17.30	143	3	0	2	1	2	0	1	0	152
I 17.45	134	3	1	1	0	2	0	0	0	141
18.00	235	14	1	6	0	2	3	2	1	257
18.30	186	7	1	1	0	1	1	0	3	197

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	302	64	3	6	2	15	15	1	7	408
J 7.30	167	27	3	3	1	7	6	2	4	216
AJ 7.45	210	40	4	7	2	5	4	3	6	275
MJ 8.00	213	42	1	4	1	6	3	1	0	271
PI 8.15	230	51	4	6	2	3	2	1	3	299
EJ 8.30	244	39	8	3	0	9	2	5	1	310
AJ 8.45	225	27	5	5	3	14	8	1	2	268
KJ 9.00	231	44	6	5	1	14	9	1	1	313
I 9.15	212	37	6	7	1	10	4	0	0	277
9.30	340	56	10	6	3	18	8	0	2	442
10.00	398	55	9	10	2	16	7	0	0	497
10.30	388	63	17	5	2	12	6	0	0	493
11.00	386	36	10	6	3	16	6	2	0	471
11.30	416	39	16	6	5	16	4	1	0	501
12.00	372	46	13	12	1	20	6	3	1	475
12.30	445	31	21	4	5	22	5	2	0	535
13.00	447	79	4	13	1	22	3	2	1	571
13.30	431	63	7	15	3	19	10	2	1	560
14.00	406	66	11	10	3	15	4	1	0	519
14.30	423	65	5	9	2	17	19	0	2	541
15.00	460	56	9	5	0	15	7	1	1	553
15.30	474	64	7	5	4	22	5	0	2	561
J 16.00	261	32	7	6	0	6	5	1	2	318
PI 16.15	279	19	2	1	0	9	6	5	1	321
MJ 16.30	293	22	4	0	0	7	2	3	1	321
PI 16.45	305	19	1	3	0	3	5	3	0	339
EJ 17.00	364	16	2	1	0	6	3	2	6	396
AJ 17.15	263	16	3	2	1	3	3	0	1	291
KJ 17.30	281	12	1	2	2	3	0	2	0	303
I 17.45	263	10	1	1	1	4	0	3	1	283
18.00	391	16	3	0	0	2	3	2	3	417
18.30	335	14	2	1	0	1	3	0	5	336

PK 000 - 0900	449	53	7	9	3	17	6	4	0	548
PK 1630 - 1730	643	44	7	2	0	12	4	3	5	715
2 HR AM PK	990	126	14	24	5	36	14	8	7	1126
2 HR PM PK	1211	88	12	7	2	22	4	8	7	1354
12 HOUR TOTAL	5575	645	103	90	29	184	93	26	27	6745
% OF TOTAL	82.95	9.56	1.53	1.33	0.43	2.73	1.38	0.39	---	100

463	106	11	9	3	15	9	4	2	620
572	31	3	4	1	7	9	5	3	632
832	182	25	16	6	32	24	6	10	1123
1088	60	9	9	2	19	20	11	5	1218
4854	624	103	79	22	175	85	24	27	5966
81.36	10.46	1.73	1.32	0.37	2.93	1.42	0.40	---	100

912	159	16	18	6	32	15	8	6	1168
1215	75	10	6	1	19	13	6	8	1347
1732	307	39	40	11	66	38	14	17	2249
2299	148	21	16	4	41	24	19	12	2572
10429	1269	206	169	51	359	178	50	54	12711
82.05	9.98	1.62	1.33	0.40	2.62	1.40	0.39	---	100

Millennium Way - DockEntrance (Wimbourne Road)

30th September, 2008

To The Docks
From The Docks
Docks Entrance leg 2way



CARS cars
LCV light commercial vehicles
MCV medium commercial vehicles
HCV 2 AXLE heavy commercial vehicles - 2 axle
HCV 3 AXLE heavy commercial vehicles - 3 axle
HCV 4+ AXLE heavy commercial vehicles - 4 (plus) axles
BUSES buses
MOTOR CYCLES motor cycles
CYCLES cycles - count NOT included in vehicle TOTALS

SITE	Millennium Way - DockEntrance (Wimbourne Road)	DATE	30/09/08
DIR	To The Docks	DAY	Tuesday

SITE	Millennium Way - DockEntrance (Wimbourne Road)	DATE	30/09/08
DIR	From The Docks	DAY	Tuesday

SITE	Millennium Way - DockEntrance (Wimbourne Road)	DATE	30/09/08
DIR	Docks Entrance leg 2way	DAY	Tuesday

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	99	30	3	1	2	4	2	0	6	141
7.30	69	19	3	2	1	2	1	0	4	97
7.45	93	27	5	2	1	3	7	2	5	140
8.00	77	25	7	1	1	2	1	0	0	114
8.15	79	26	1	2	0	1	0	0	0	109
8.30	56	12	2	0	0	3	1	0	1	74
8.45	49	12	1	3	1	8	1	0	0	75
9.00	33	12	4	1	1	8	4	0	0	63
9.15	34	17	1	0	1	1	2	0	0	56
9.30	37	27	2	2	0	8	1	0	0	77
10.00	44	10	2	4	0	5	0	0	0	65
10.30	51	15	3	1	0	5	1	0	0	76
11.00	47	9	3	1	2	11	0	0	0	73
11.30	35	21	6	2	0	7	1	0	0	72
12.00	37	11	4	4	0	10	0	0	1	66
12.30	46	7	2	4	1	10	0	1	0	71
13.00	80	27	1	5	1	11	1	0	0	106
13.30	41	21	3	6	1	10	1	2	1	64
14.00	39	17	8	2	2	4	2	1	0	72
14.30	27	10	4	2	2	9	2	0	0	56
15.00	43	15	3	3	0	8	1	2	0	75
15.30	54	14	3	2	0	7	0	2	0	82
16.00	15	1	1	3	0	3	0	0	0	23
16.15	21	4	0	1	0	4	1	0	0	31
16.30	16	5	1	0	0	2	0	0	0	24
16.45	31	4	1	1	0	1	1	0	0	39
17.00	24	2	0	0	0	1	1	0	0	28
17.15	14	3	0	1	0	3	0	0	0	21
17.30	21	3	0	1	0	1	0	0	0	26
17.45	10	3	0	2	0	2	0	0	0	17
18.00	11	2	0	0	0	1	0	0	0	14
18.30	20	2	0	1	0	0	0	0	0	23

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	19	4	0	2	0	9	2	1	2	37
7.30	10	2	0	0	0	2	2	0	1	16
7.45	21	4	1	5	0	2	1	0	0	34
8.00	19	2	1	3	0	3	0	0	0	28
8.15	13	11	1	2	1	1	1	0	0	30
8.30	15	9	1	0	0	5	0	0	0	30
8.45	18	7	3	3	2	4	0	1	1	38
9.00	23	14	0	2	0	9	1	0	0	45
9.15	17	15	4	2	1	7	3	0	0	49
9.30	33	21	4	2	0	9	1	0	0	70
10.00	50	23	2	6	2	6	1	0	0	92
10.30	41	24	7	3	0	6	0	0	0	83
11.00	33	15	6	2	1	5	1	0	0	63
11.30	48	12	8	2	3	9	1	0	0	79
12.00	45	10	5	3	0	5	2	0	0	70
12.30	63	13	6	2	3	9	0	0	0	96
13.00	50	24	1	3	1	8	0	0	1	87
13.30	44	16	0	3	2	12	3	0	0	80
14.00	37	17	6	3	1	10	1	0	0	75
14.30	51	15	1	2	2	8	4	2	0	85
15.00	82	20	3	0	0	7	0	3	0	115
15.30	61	30	2	1	3	9	2	0	1	108
16.00	54	6	0	0	0	2	0	0	0	62
16.15	75	10	1	1	0	6	1	0	1	94
16.30	74	11	2	0	0	3	1	0	0	91
16.45	46	9	0	1	0	1	0	2	0	59
17.00	81	5	1	2	0	4	0	0	3	93
17.15	85	13	2	0	0	1	2	1	1	84
17.30	38	5	1	0	1	0	0	1	0	46
17.45	54	9	1	0	1	1	0	1	1	63
18.00	34	1	2	0	0	0	0	0	3	37
18.30	20	1	1	0	0	0	1	0	2	29

START PERIOD	CARS	LCV	MCV	HCV 2 AXLE	HCV 3 AXLE	HCV 4+ AXLE	BUSES	MOTOR CYCLES	CYCLES	TOTAL
7.00	118	34	3	3	2	13	4	1	8	178
7.30	79	21	3	2	1	4	3	0	5	113
7.45	114	31	6	7	1	6	8	2	5	174
8.00	96	27	8	4	1	5	1	0	0	142
8.15	92	37	2	4	1	2	1	0	0	139
8.30	71	21	3	9	0	6	1	0	1	104
8.45	67	19	4	6	3	12	1	1	1	113
9.00	56	26	4	3	1	13	5	0	0	108
9.15	51	32	5	2	2	8	5	0	0	105
9.30	70	48	6	4	0	17	2	0	0	147
10.00	94	33	4	10	2	13	1	0	0	157
10.30	92	39	10	4	0	13	1	0	0	159
11.00	80	24	9	3	3	16	1	0	0	136
11.30	83	33	14	4	3	12	2	0	0	151
12.00	82	21	9	7	0	15	2	0	1	136
12.30	108	20	8	6	4	19	0	1	0	167
13.00	110	51	2	8	2	19	1	0	1	193
13.30	85	37	3	8	3	22	4	2	1	164
14.00	76	34	11	5	3	14	3	1	0	147
14.30	78	25	5	4	4	17	6	2	0	141
15.00	125	35	6	3	0	15	1	5	0	190
15.30	115	44	5	3	3	16	2	2	1	180
16.00	89	7	1	3	0	5	0	0	0	85
16.15	96	14	1	2	0	10	2	0	1	125
16.30	90	16	3	0	0	5	1	0	0	115
16.45	77	13	1	2	0	2	1	2	0	98
17.00	105	7	1	2	0	5	1	0	3	121
17.15	79	16	2	1	0	4	2	1	1	105
17.30	59	8	1	1	1	1	0	1	0	72
17.45	64	8	1	2	1	3	0	1	1	80
18.00	45	3	2	0	0	1	0	0	3	51
18.30	46	3	1	1	0	0	1	0	2	52

PK 800 - 0900	261	75	11	6	2	14	3	0	0	372
PK 1630-1730	85	14	2	2	0	7	2	0	0	112
2 HR AM PK	490	150	24	11	6	28	17	2	10	728
2 HR PM PK	152	25	3	9	0	17	3	0	0	209
12 HOUR TOTAL	1333	413	71	59	17	155	32	10	18	2090
% OF TOTAL	63.78	19.76	3.40	2.82	0.81	7.42	1.53	0.48	---	100

PK 800 - 0900	65	29	6	8	3	13	1	1	1	126
PK 1630-1730	266	38	5	3	0	9	3	3	4	327
2 HR AM PK	136	64	11	17	4	29	8	1	2	270
2 HR PM PK	487	64	8	4	2	18	4	5	6	592
12 HOUR TOTAL	1340	374	73	55	24	159	31	12	17	2068
% OF TOTAL	64.80	18.09	3.53	2.66	1.16	7.69	1.50	0.58	---	100

PK 800 - 0900	326	104	17	14	5	27	4	1	2	498
PK 1630-1730	351	52	7	5	8	16	5	3	4	439
2 HR AM PK	626	214	35	28	10	57	28	3	12	998
2 HR PM PK	639	89	11	13	2	35	7	5	6	801
12 HOUR TOTAL	2673	787	144	114	41	314	63	22	35	4158
% OF TOTAL	64.29	18.93	3.46	2.74	0.99	7.55	1.52	0.53	---	100



Appendix 24

Flood Risk Assessment



RSK Environment Ltd
West Nash Road
Nash
Newport
NP18 2BZ

Telephone: +44 (0) 1633 272339

www.rsk.co.uk

30 June 2008

Marco Muia
Oaktree Environmental Ltd

Our Ref: RSK/MA/P660003/01/01

Dear Marco,

RE: FLOOD RISK, BARRY SUNRISE CHP PLANT, BARRY DOCKS

As a part of the planning application for the Barry site, RSK Environment Ltd has been commissioned to provide an assessment of flood risk. The following paragraphs explain the work undertaken.

The proposed development is located within Zone B but outside Zone C2, as identified by Technical Advice Note 15: Development & Flood Risk (July 2004) (TAN15). Zone B can be defined as "areas known to have been flooded in the past evidenced by sedimentary deposits" and Zone C2 as "areas of floodplain without significant flood defence infrastructure". Any development within Zone C would require a full Flood Consequences Assessment (FCA).

The proposed development is also located outside the Environment Agency Wales (EAW) extreme (0.1%) Flood Map, which would normally underlay Zone B. Although a full FCA is not required, the EAW promote a precautionary approach where site levels should be compared against the adjacent extreme outline to determine if the site is at risk of flooding.

We therefore undertook a topographic survey of the site and produced three cross sections from north of the site through to the direction of the dock to confirm that the development is above the adjacent extreme flood outline and corresponding Zone C2. These are attached as Annex A. When flood level data was requested from the EAW, we were notified that the only available data was over 10 years old and not for the location requested. The data would have to be extrapolated from levels in Cardiff and Porthcawl.

This information was submitted via email to the EAW as a pre-planning enquiry on the 25 June 2008 (E-mail to EA attached as Annex B together with previous correspondence). In a subsequent conversation with Matthew Parry, Development Control Officer (and Acting Team Leader) of the EAW on the 26 June 2008, he confirmed that the site was not at risk of flooding and the cross sections were acceptable. A recent policy change within the EAW meant that applications in Zone B were taken on a risk-based approach and if the zone is outside the Q1000 Flood Map, then there is no perceived risk to the development.

A formal response from the Planning Liaison to the pre-planning enquiry is awaited, although Matthew has indicated that there is no objection to the proposed development from the information submitted.

I trust this information is sufficient for the purposes of the planning application and please do not hesitate to contact me should you have any further questions or queries.

We will submit the expected further correspondence from the EA to you when available.



RSK Environment Ltd
Registered office
34 Albyn Place · Aberdeen · Aberdeenshire · AB10 1FW · UK
Registered in Scotland No. 115530
www.rsk.co.uk

1

Yours Sincerely,

Catherine Anderson MSc
Environmental Consultant
RSK Environment Ltd
Part of the RSK Group plc
<mailto:canderson@rsk.co.uk>
Direct Line: 01454 227575

Enc.

Annex A: Topographic Survey and Cross Sections

Annex B: EA Correspondence, including EAW Flood Data and Welsh Assembly Government Development Advice Map (DAM) of TAN15 zones



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Registered in Scotland No. 115530
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Scale: not to scale
 Drawn: J. Davies Date: 05/01/08
 Drawing No.: 2007-271107-03
 Cell Site number: -

Title:
**PROPOSED
 CABLE ROUTE**

Site Name and Address
**Barry
 South Wales**

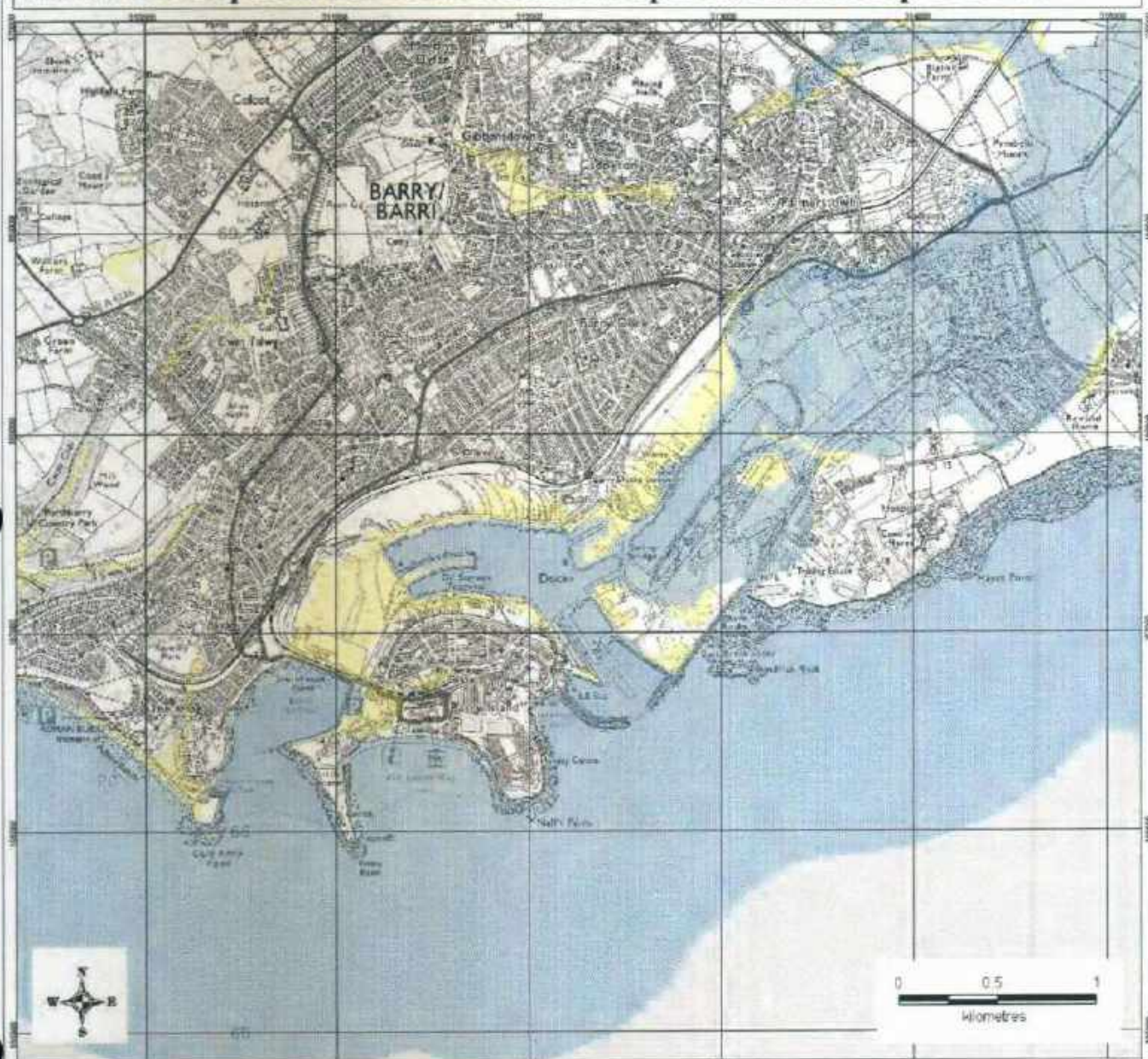







2 Chamwood Court
 Newport Street
 Swindon
 Wiltshire SN1 7JZ

LEGEND:

--- UNDERGROUND CABLE ROUTE

TAN15 Development and Flood Risk: Development Advice Map ST16NW



		Zone A: Considered to be at little or no risk of fluvial or tidal/coastal flooding		Zone C1: Served by significant infrastructure, including flood defences
		Zone B: Areas known to have been flooded in the past		Zone C2: Without significant flood defence infrastructure

Zones C1 & C2 based on Environment Agency's Extreme Flood Outline (>= 0.1% - River, Tidal or Coastal)

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 Mae atgynhyrdd heb ganiatâd yn torri hestfrant y Gornn a gall hyn swmian at enfydd neu achos sifil. Cymhiliad Cmedfaethol Cymru - Rhif trwydded 100017915

Rob Domoney

From: Catherine Anderson
Sent: 24 June 2008 10:30
To: Parry, Matthew; mike.walsh@environment-agency.gov.uk
Subject: Barry Sunrise CHP Plant
Attachments: EA response.pdf; P1580.dwg; P1580_Sections.dwg; barry location.pdf; Barry_ST16NW.jpg

Matthew/Mike

Please find attached the following:

- * Location plan
- * DAM map;
- * Topographic survey and cross sections; and
- * EAW food level data.

The application is for a CHP plant in Barry Docks and from the DAM is located within a zone B. However from the EAW flood map there is no underlying Q200 or Q1000. In addition, a letter from Kayna we found on the planning register states that there has been no history of flooding to an adjacent development and the EAW had no objection to the development in relation to flood risk.

We have undertaken a topographic survey of the area which shows levels to be 7.83m AOD nearest the dock rising to 9.4m AOD to the north of the site. Looking at the EAW level data, it is stated that no levels are available for the Barry area, but extrapolating the levels from the Cardiff and Porthcawl data provided would put the Q200 at approximately 7.55m AOD and Q1000 at 7.85m AOD. However this data is now over 10 years old.

This is not an exact science and I would appreciate your view on this especially when other adjacent sites have been identified as being not at risk from flooding. The intention is to raise the site approximately 300-600m to make it more level with the north of the site anyway so would this be adequate mitigation for a site in zone B?

Your comments would be most beneficial to this project so that we can progress the site appraisal.

Kind Regards
Catherine

Catherine Anderson
Environmental Consultant

RSK Environment Ltd
West Nash Road, Nash, Newport, NP18 2BZ.

A member of the RSK Group plc

Office: 01633 276051. Mobile: 07917 425260; email: canderson@rsk.co.uk

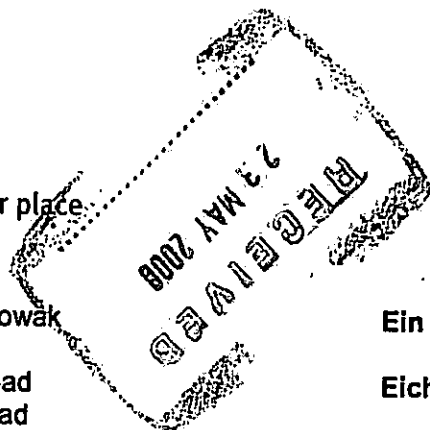
<http://www.rsk.co.uk>

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Asiantaeth yr
Amgylchedd Cymru
Environment
Agency Wales

Ms Katarzyna Nowak
RSK Ltd
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Ein cyf/Our ref: SAF12782

Eich cyf/Your ref: 080506CB027

Dyddiad/Date: 22nd May 2008

Dear Ms Nowak

Re: Flood Risk and Drainage Assessment - Barry, Vladuct Road CF63 4AB

Thank you for your enquiry with regards to obtaining flood level information for a site in Barry. Please find attached and below information that has been provided by our Flood Risk Mapping Team that should answer your enquiry in full.

The Flood Map consists of a combination of detailed localised flood risk mapping studies, supplemented with national generalised modelling. In the absence of any localised study for the area, the flood extents shown in **Figure 1** are from generalised modelling only. These have been derived from two components; a 3D ground level map of England and Wales (referred to as the Digital Terrain Map or 'DTM') and a 2D flow / tidal modelling component.

In **Figure 1**, the risk from flooding is predominantly tidal. These tidal extents have been produced using stillwater tide levels that are based upon Dixon, M.J. and Tawn, J.A. (1997) "Extreme Sea Levels at the UK A Class Sites: Optimal Site by Site Analyses and Spatial Analyses" - Proudman Oceanographic Laboratory, Internal Document No. 112. They do not take into account any wave action or climate change, and are based for the year 1997.

Tide levels are available for Cardiff (approx NGR ST 18030, 74612) and Porthcawl (approx NGR SS 78544, 79401). The predicted levels are as follows:

CARDIFF

0.5% (YEAR 1997) = 8.17mAOD

0.1% (YEAR 1997) = 8.40mAOD

PORTHCAWL

0.5% (YEAR 1997) = 7.03mAOD

0.1% (YEAR 1997) = 7.25mAOD

We are not aware of any historic flooding to the site.

I hope that this information is of use to you. Please feel free to contact me on 029 2024 5236 if you require further information.

Kindest Regards

Darren Jones
External Relations Officer

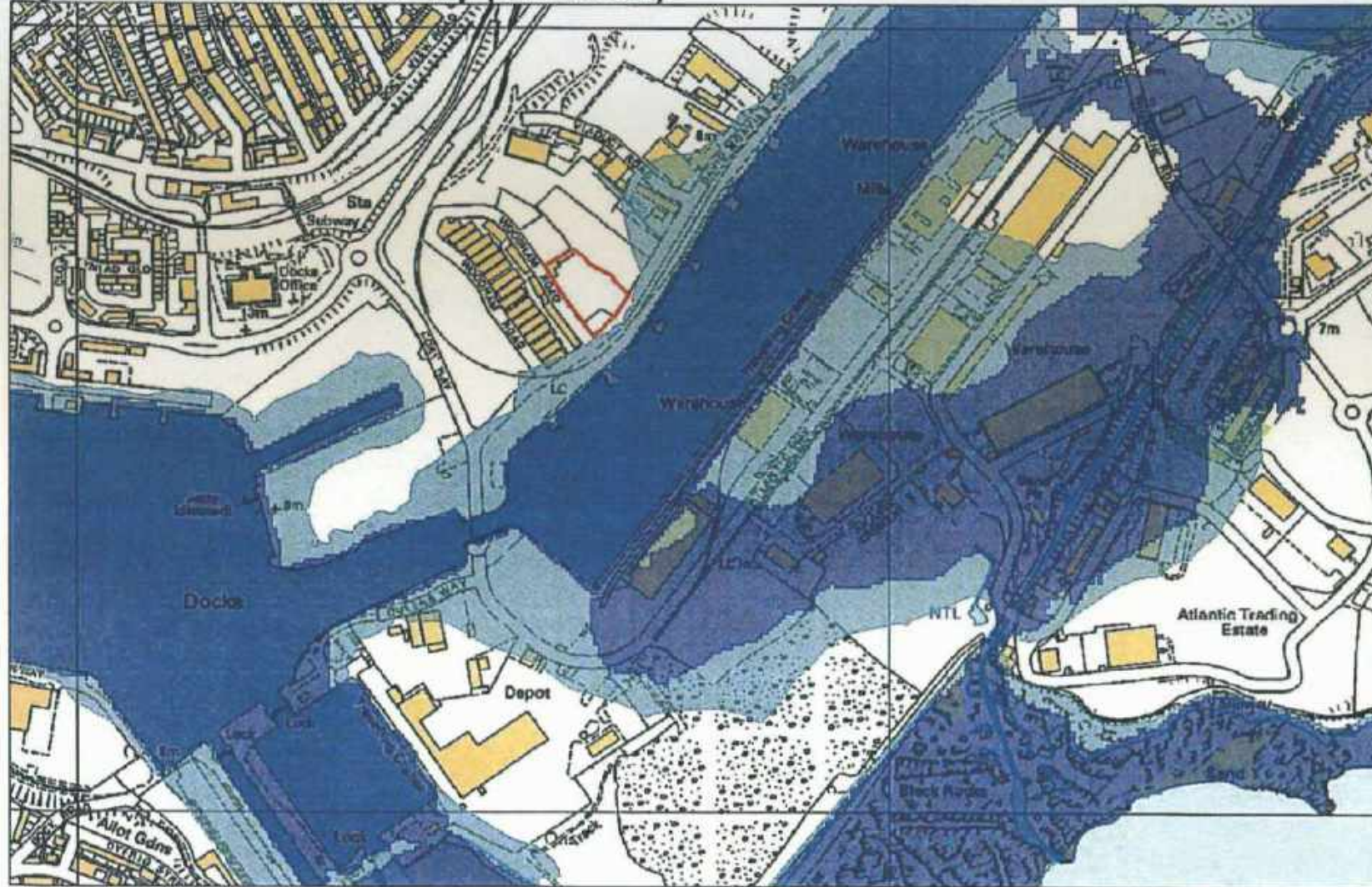
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CF3 0EY
Llinell gwasanaethau cwsmeriaid: 08708 508 508
E-bost: enquiries@environment-agency.gov.uk
www.asiantaeth-amgylchedd.cymru.gov.uk

Environment Agency Wales
Rivers House, St Mellons Business Park, St Mellons, Cardiff,
CF3 0EY
Customer services line: 08708 508 508
Email: enquiries@environment-agency.gov.uk
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511
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Figure 1: The Current Flood Map (version 3.8)



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Key:

Dark Blue area : Flooding from rivers or sea without defences

Light Blue area : Extent of extreme flood

Red Boundary : Site of interest (as marked in pen on attached 'Streetmap' printout - dated 6th May 2008)



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6. If we have specified that you must pay us for supply of the Information you must pay us before we respond to your request. You will only be able to cancel and request your fee back up to the point when we start work on providing the requested information.
7. If you have asked for the Information to be supplied in an electronic format we cannot guarantee that either the disk or the data file is free of any defects and you should check it for viruses and other items that may affect your computer.
8. Use of Third Party Information, including copying, must be limited to statutory rights. This generally means that you will need to seek permission to copy. Third Party Information may include information from our public registers, which has been supplied to us by a third party, for example the information provided in an application form.

Permitted use of Agency Information

9. As you have paid us our internal commercial usage charge (currently £10) you may take unlimited copies of Agency Information (exactly as it is) for the internal purposes of your business (commercial internal limited use), provided that:
 - a) you ensure that all copies are attributed to the Environment Agency;
 - b) you do not amend or alter the Information, or merge it with other information;
 - c) you do not supply the Information (or any information derived from, or based on the use of it) to others.
10. If you are a professional advisor and you have paid us our internal commercial usage charge (currently £10) you may in addition to the rights in paragraph 9, give copies of Agency Information (exactly as it is) to your client and any other person who reasonably requires a copy (limited professional use); provided that:
 - a) any copies you send are in connection with the specific transaction or matter for which you obtained the Information from the Environment Agency;
 - b) you make no charge for supplying the Information other than for your actual costs and time incurred;
 - c) you attach a copy of this notice and require all recipients to comply with it.

Recipients of Information under this paragraph do not need to pay any additional fee as long as they use the Information exactly as it is, internally and only for the same specific transaction or matter.

11. Please contact us if you need permission for any other use.



Appendix 25 Combined Plant Noise Report

AB acoustics

Unit 8
Laurel Trading Estate
Higginshaw Lane
Royton
Oldham
OL2 6LH

T : 0161 620 2828
F : 0161 626 1979
e-mail : leachabacoustics@aol.com

Oaktree Environmental Ltd
Unit 5
Oasis Park Road One
Winsford Industrial Estate
Winsford
Cheshire
CW7 3PP

18 March 2009.

For the attention of Mr M Muia

Dear Sirs

Reference : Proposed Biomass Plant Barry South Wales

It is understood that in addition to the proposed Biomass Plant on Woodham Road there is a proposal to operate an Energy Recovery Facility on Atlantic Road in the Dock Area (the proposed site is approximately 350 / 400m to the south of the proposed Biomass site across the dock.

As both plants will have an impact on the environment this note considers the combined effect for a noise point of view should both plants be approved.

From the report issued by AB acoustics dated 23 December 2008 background noise levels were measured at three locations – 1 Dock View Road / Castleland Street – 2 Cory Way and 3 Cei Dafydd (Y Rhodfa) with the following results (copied from our report dated 23 December 2009).

These levels are the calculated Specific Noise Level for the various locations – with respect to BS 4142 a +5 dBA correction factor should be added to the above figures to account for the tonal character etc of the noise – therefore the resulting Rating Levels are :

Location 1 : 37 dBA

Location 2 : 40 dBA

Location 3 : 32 dBA

These are the levels that are compared to the lowest measured background (L_{90}) at the various locations :

	<i>Difference to Rating Level</i>
Location 1 : 41.6 dBA (00.25 / 00.35)	- 4.6 dBA
Location 2 : 40.1 dBA (00.55 / 01.05)	- 0.1 dBA
Location 3 : 40.1dBA (00.40 / 00.50)	- 8.1 dBA

Therefore if the specified internal level of 90 dBA is achieved then the external level from the proposed plant at the various locations will be equal to or less than the measured background level – this is an indication that complaints about noise will not be received.

The following should be noted :

No roof lights should be fitted into the roof as these do not have as high an attenuation as the 'normal' roof panels.

If the internal level within the proposed plant is in excess of the specified 90 dBA (or is projected to be) then the attenuation of the panels forming the skin of the building must be increased to account for the increase in internal noise level – further details www.kingspanpanels.com

With respect to the predicted levels for the Biogen Plant (taken from Table 9.5 – page 128 - of The Environmental Statement for the Barry Energy Recovery Facility prepared by Parsons Brinckerhoff Ltd) it is seen that the predicted Rating Level at the two common locations is calculated to be :

- 1) St Mary's Avenue / Dock View Road) = 24 dBA
- 4Y Rhodfa = 28 dBA.

Therefore to calculate the overall level of noise should both plants be approved then both these calculated Rating Levels need to be added together :

$$\text{Location 1} = 37 + 24 = 37 \text{ dBA}$$

$$\text{Location 3} = 32 + 28 = 33 (33.4) \text{ dBA}$$

If these new calculated Rating Levels are then compared to the lowest measured background levels above the following results :

$$\text{Location 1} = - 4.6 \text{ dBA}$$

$$\text{Location 3} = - 7.1 \text{ dBA}$$

Therefore if the specified internal level of 90 dBA is achieved for the Biomass Plant then the external level from the proposed plant and the additional Biogen Plant at the two locations will be less than the measured background level – this is an indication that complaints about noise will not be received.

However in the acoustic report for the Biogen Plant a lower background level (measured at approximately 01.40 – Y Rhodfa and at approximately 03.40 – Dock View Road) was recorded : these are quoted as 29 (28.5) dBA and 30 (29.7) dBA respectively.

If these background levels are used then the combined effect of both plants operating with respect to background levels is :

Location 1 = +8 dBA

Location 2 = + 3 dBA

Location 1 therefore results in an increase in noise level that is between that which is considered of *marginal significance* and that which *could result in complaints* with respect to BS 4142.

Therefore the external level could be reduced by either reducing the internal level within the plant to 85 dBA (rather than the 90 dBA suggested in the report dated 23 December 2009) or by increasing the attenuation offered by the building envelope.

If a 5 dBA increase in attenuation is achieved then the increase in noise level from both plants will be below that which is considered to be of *marginal significant* with respect to BS 4142.

I hope the above is sufficient for your present needs, if however you require any additional information please do not hesitate to contact us.

Yours faithfully

Roger Leach

AMIOA



Appendix 26 Drawing no. SRB/003



- KEY:**
- Site Boundary
 - P Parking space
 - D Disabled parking space

Notes:

Revision Details:

Rev	Description	Date
-	First Draft	14/08/08
-	Application copy	05/09/08



Appendix 27 Document no. SRB-I

1

Types of wood for recycling

This section shows the main wood types seen in the mixed waste stream. The purpose is to help you to recognise the different wood types that pass through your site and to help you meet your recycler's specifications.

The wood types described here can be categorised as clean wood, laminated wood products and products made from various sizes of wood chip. Compare the types of wood described here with Section Four which you can use to show the specification you are using on site.



Softwood

Softwood is sourced from coniferous trees and tends to be cheaper and less dense (heavy) than hardwood. Softwood is normally used for packaging such as pallets, crates and reels and as framing.



Hardwood

Hardwood is sourced from broadleaved trees. It is often darker in colour than softwood and is longer lasting, denser & more decorative than softwood. Hardwood is typically used in expensive furniture and as a veneer on cheaper materials, such as chipboard or MDF.



Blockboard

Blockboard is made up of a core of softwood blocks (up to about 25mm wide) placed edge to edge and sandwiched between veneers of hardwood. The 'sandwich' is then bonded under high pressure. Blockboard is an old fashioned product now less common than chipboard. It is used in furniture and kitchen applications.



Plywood

Plywood sheets are made by bonding together a number of thin sheets to create a strong flexible product. Plywood has many uses depending on the wood used in the different layers and the bonding agent. It may be used in applications as varied as concrete shuttering, in DIY and marine ply.



Orientated Strand Board (OSB)

OSB is a layered board, made of wafers of softwood with opposing grain to give strength. OSB has similar uses to plywood.



Chipboard

Chipboard panels are made by bonding together wood particles with an adhesive under heat and pressure to form a rigid board with a relatively smooth surface, in which the wood chips are visible. Chipboard is used in most flat-pack furniture, though often with a painted or plastic laminated surface.



Medium Density Fibreboard (MDF)

MDF panels are made from wood fibres glued under heat and pressure. MDF differs from chipboard in that no woodchips are visible. MDF is used as doors and drawer fronts with decorative moulding and in DIY it is often painted or plastic coated.



Hardboard

Hardboard is a thin brown or painted panel in which the wood chips are not visible. Hardboard tends to be used in cheaper furniture as drawer bottoms or backs.

2

Contaminants and the problems they cause the recycler

This section shows the types of contamination you may see coming into your site, where it comes from and the main ways of removing it.

Your recycler may have equipment fitted to remove some contaminants, however prevention of contamination makes it easier to produce a quality product from the wood you collect.

Compare the types of contamination described here with Section Four which you can use to show the specification you are using on site.



Surface Treatments – paints and varnishes

Surface treatments like paint and varnish are used to change the appearance of the finished product and to protect items from wear and water damage. A particular problem is that paints or varnishes may contain lead or other chemicals which make them unacceptable for some end market uses. Such items can only be removed by picking.



Metal

Metal components, such as nails and screws, are used to join wood together or as fittings for doors and windows. Large pieces of metal can cause damage to wood recycling machinery and can be dangerous to users of products made from recycled wood, for example nails in horse bedding. Ferrous metals, such as nails, can be removed using magnets. Non-ferrous metals, such as aluminium and brass fittings, may be removed by an eddy current separator.



Glass and Putty

Glass and putty are typically found in wooden windows. Putty may melt and soil or blunt cutting equipment. Glass contamination is dangerous to users of products made from recycled wood such as bedding or mulches. Putty contains oils which can affect the manufacturing processes used to create products from recycled wood, such as panelboard. Glass and putty found in doors and window frames should be removed where possible. Glass particles are difficult to remove except with expensive equipment.



Paper

Paper from labels, wrapping or cores in cheap doors affects the performance of products made from recycled wood as it does not behave in the same way as the rest of the wood. Paper should be removed by picking where possible.



Plastic – solid and sheeting

Plastic may be present as a packaging material in wood effect cabinets or as a veneer on chipboard and MDF. Plastic can melt resulting in fouling of the production process. The presence of plastic contamination can affect the end uses, for example they may be unacceptable in biomass fuels. Plastic is best removed by picking.



Rubber, Foam and Fabric

Rubber, foam and fabric tend to occur together in upholstery and, either separately or together, can cause tangles or jam equipment. These materials may burn or melt damaging cutting surfaces and other parts of the equipment. Rubber, foam and fabric are best removed by picking. Rubber, in particular, has a similar density to wood and is very difficult to remove mechanically, except with expensive equipment.



Chemical Treatments

Chemical treatments are usually applied to wood to provide protection against the weather and water. They can typically be recognised as a green or brown stain, for example on garden fencing or sleepers. Ask your site manager for advice as some may be acceptable. A few may be hazardous to health and banned by legislation. Chemically treated wood can be picked out. Remember to wear the correct clothing. New testing kits may help identify treated wood at source. See www.recyciewood.org.uk for more details.

3

Current markets for products made from recycled wood

This section shows the range of products that can be made from wood collected for recycling in the UK.

The cleanliness and type of recycled wood collected will directly affect the final products that can be manufactured. Some examples of the products being produced in the UK are shown here. Ask the recycler you supply which products they produce.



Panelboard

The most common product is chipboard. It is extensively used in construction, furniture and DIY. It may be sold in simple sheet form, or pre-machined for specific uses. It may also be laminated with decorative finishes for such uses as DIY.



Horse Bedding

Horse bedding can be made from recycled wood. Dust and nails must be extracted to protect the horses and only clean packaging wood waste can be used. Woodchip provides a warm and absorbent bedding which lasts for several weeks, reducing the costs and need for mucking out.



Poultry Bedding

Poultry bedding is used in the rearing of poultry for both meat and egg production. For this reason it must be free from health threats to both consumers and birds. The bedding must be light coloured and absorbent.



Cattle Bedding

Recycled wood products can be used successfully for over-wintering of cattle. Large particles are needed to provide free drainage outside. However when inside small particles are required to provide high rates of absorbency.



Pet Bedding and Cat Litter

Recycled wood based products are safe and clean for use as cat litter and pet bedding. The material needs to be very clean and free from contamination.



Horse Arenas and Gallops

The need to be able to train and ride horses despite the weather has led to the development of all-weather surfaces for gallops and arenas, both internal and external. Recycled wood based products work well for all these uses, but all contaminants need to be removed and specific chip sizes are required.



Play Areas

Recycled wood based products are used in significant volumes for play area surfacing and have performance and cost benefits for this application. The material needs to be very clean and free from contamination.



Mulch and Pathway Coverings

Recycled wood chips can be used very effectively as a mulch to suppress weeds, reducing the need for chemical or manual weeding, and as a pathway surfacing to reduce maintenance requirements. These products can also be coloured for creative landscaping.



Composting

The process of composting materials with high moisture content can be improved by adding dry material such as shredded chipboard.



Fuel for Energy Production




Highly efficient boiler systems are now available which burn wood for heat or for electricity generation. Recycled wood is ideal for conversion into fuel pellets or chips, due to its low moisture content.

4 Guidance on separating wood for recycling at source

The Specification – what we want & where it should go

This poster can be used to show the types of wood that typically come on to site. It should be used to show what is wanted and what should not be separated for recycling.

You can put ✓ or ✗ in the first column or you may want to show which skips to use for different types of wood.

Different Wood for Recycling	What it Looks Like	Different Levels of Contamination	Wanted or Where to put it?
Clean white wood and offcuts		Without any nails, fixtures or fittings With nails, including pallets and boxes With nails and other metal fixtures	
Painted or stained wood		Including solid wood furniture with paint or varnished finish	
Panel and sheet materials including offcuts		Plain chipboard, plywood, MDF and blockboard Painted & laminated chipboard, plywood, MDF and blockboard	
TV cabinets and electrical goods		Wood mixed with plastic or electrical items	
Indoor furniture		Chipboard and flat pack Pine and solid wood Upholstered	
Wooden doors and window frames		Without glass and metal fittings With metal fittings With glass and metal fittings	
Outdoor wooden furniture, fencing and fence panels		Anything stained or sprayed with preservative (green or brown)	
Wood mixed with other materials		For example with plasterboard, bricks etc	
Railway sleepers, fence panels and posts		Anything potentially treated with creosote (brown and oily)	
Green waste		Logs, branches, prunings and other freshly cut tree material	



Creating markets for recycled resources

For more information on wood waste please go to www.recyclewood.org.uk or to read more detailed studies on wood waste arisings visit www.wrap.org.uk/materials/wood

WRAP (Wood Waste & Recycling Action Programme) is a major UK programme established to promote resource efficiency. Its Sustainable Focus is an exciting market and offshore market for recycled materials and products and offering services to waste minimisation, reuse and recycling. It is a not-for-profit company. WRAP is funded by a combination of Government Funding from Defra and the devolved administrations in Scotland, Wales and Northern Ireland.

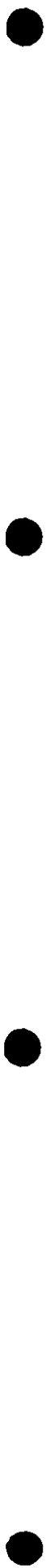
While great care has been taken to ensure its accuracy, WRAP does not accept responsibility or liability for any errors or omissions. For more details, please refer to our Terms & Conditions on our website www.wrap.org.uk.

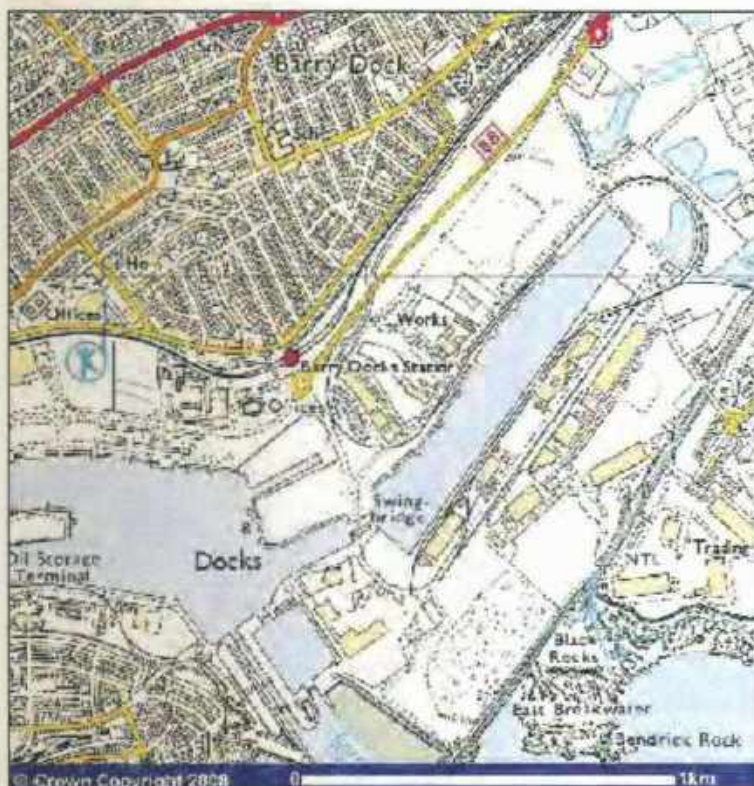
Printed on 100% recycled paper



Appendix 28

Drawing no. SRB/001





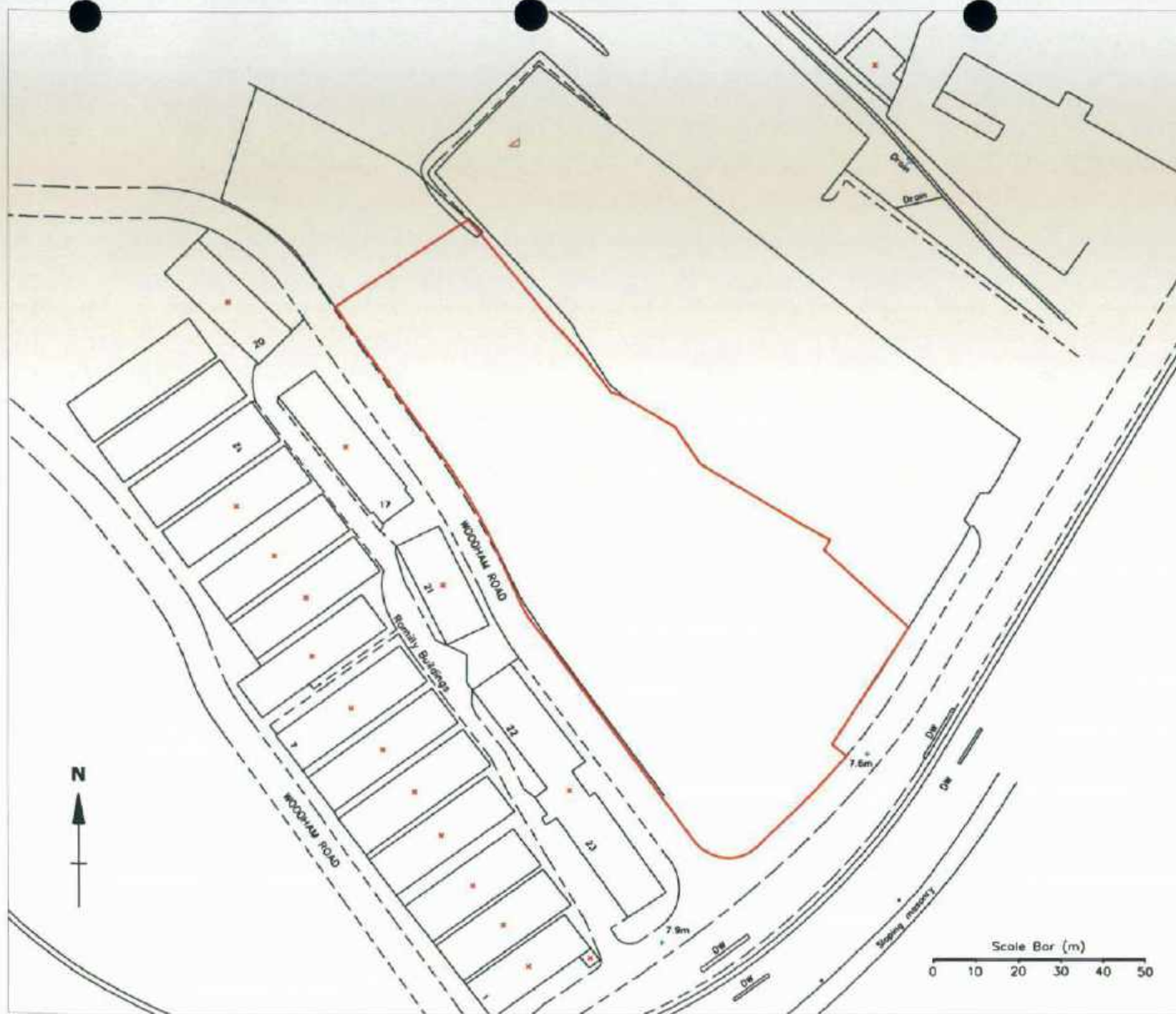
© Crown Copyright 2008

Drawing No.	SRB/01	Date	06 August 2008	
Revision	A	Prepared by	IH	
Title	Site Location Map			
Scale	as shown			
Client	Sunrise Renewables			
Site	Barry Docks, Barry			
<p>Oaktree Environmental Ltd Unit 5, Oasis Park, Road One, Winsford Industrial Estate, Winsford, Cheshire CW7 3RY Tel: 01606 558833 Fax: 01606 861182 e-mail: sales@oaktree-environmental.co.uk</p>				
<p>Reproduced with the permission of the controller of H.M.S.O. Crown copyright licence No. 100015148</p>				



Appendix 29

Drawing no. SRB/002



Unit 5, Oaks Park, Road One
 Winford Industrial Estate, Winford
 Cheshire CW7 3JY
 Tel: 01606 558833 Fax: 01606 861182 E-mail: sales@oaktree-environmental.co.uk

Title: **SITE LOCATION PLAN**

Drawing No: **SRB/02**

Client: **Sunrise Renewables Ltd**

Site: **Woodham Road, Barry**

NGR:

Date: **5 September 2008** Printed At: **A4**

Scale: **1:1,250**

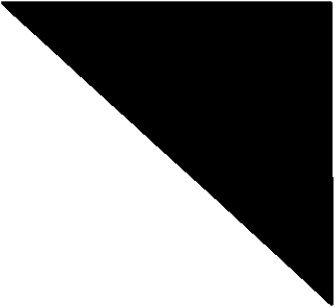
Revision: **A** Drawn By: **RS** Checked:

KEY:
 — = Application Site

Notes:

Revision Details:

Rev	Description	Date
-	First Draft	14/08/08
A	Application copy	05/09/08



Appendix 30 Drawing no. SRB/004

Title: BUILDING ELEVATIONS

Drawing No: SRB/04

Client: SUNRISE RENEWABLES LTD

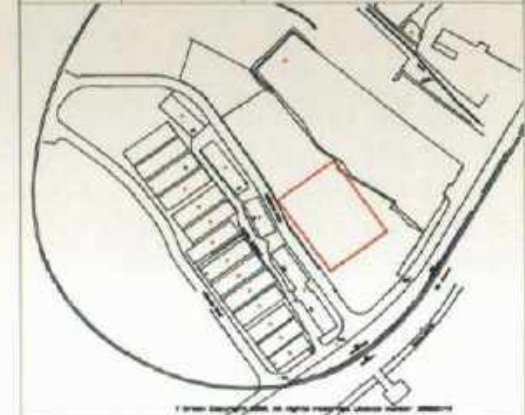
Site: WOODHAM ROAD, BARRY

Scale: 1:200
 1:2,500

Date: 29 AUGUST 2008

Printed At: A1

Revision: -
 Drawn By: RS
 Checked:



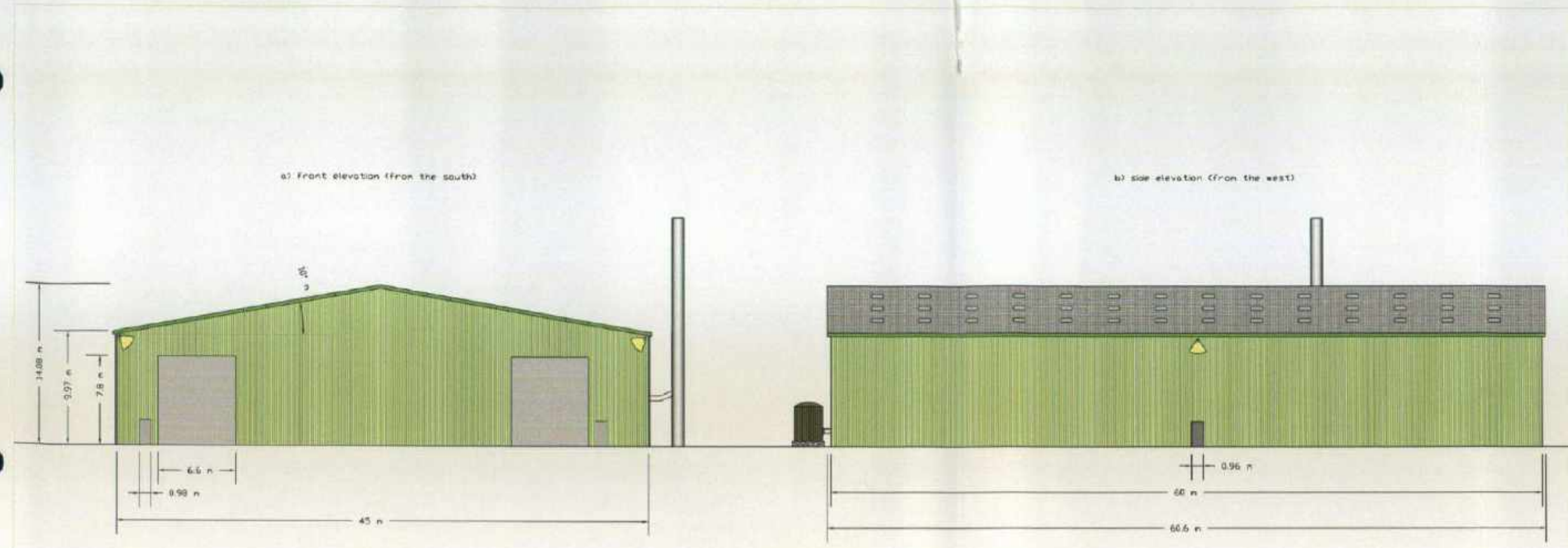
Notes:

- Building eave height = 10 m
- Building ridge height = 14.07 m
- Angle of roof pitch = 10°
- Building footprint = 60 m x 45 m
- Roller shutter doors = 6 m width x 7.5 m height
- Fire doors = 0.98 m width x 2.2 m height
- Stack height shown is 20 m which is given for indication, actual stack height will be lower

FOR CONSULTATION ONLY

Revision Details:

Rev	Description	Date
-	First Draft	03/07/2008
A	Application Copy	29/08/2008



Adran yr Amgylchedd, Cynaliadwyedd a Thai
Department for Environment, Sustainability and Housing



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Mr R Thomas
Head of Planning and Transportation
The Vale of Glamorgan Council
Dock Office,
Barry Docks,
Barry CF63 4RT

Eich cyf : Your ref: 2008/01203/FUL
Ein cyf : Our ref : A-PP172-51-qA786890
Dyddiad : Date: 23 December 2009

Dear Sir,

TOWN AND COUNTRY PLANNING ACT 1990 – SECTION 78
TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
(ENGLAND AND WALES) REGULATIONS 1999 (AS AMENDED)
APPEAL BY SUNRISE RENEWABLES LTD
PROPOSED 9MW WOOD FUELLED RENEWABLE ENERGY PLANT ON LAND AT
WOODHAM ROAD, BARRY, VALE OF GLAMORGAN

1. I refer to the above appeal against the refusal of the Vale of Glamorgan Council to grant planning permission for the development the subject of application reference number 2008/01203/FUL. As part of the appeal process the Planning Inspectorate has sought the opinion of the Welsh Assembly Government's Planning Division as to whether Environmental Impact Assessment (EIA) of the appeal is required under the above Regulations.

2. When the application the subject of the appeal was before the Council the Welsh Ministers were requested to issue a screening direction indicating that the proposed development should be subject to EIA. On 9 July 2009 the Welsh Ministers issued a screening direction indicating that, while the proposed development was considered to fall within the description contained in paragraph 10 of Schedule 1 to the 1999 Regulations, on assessment of the likely environmental effects of the proposed development, EIA was not required.

3. Although the Welsh Ministers directed that EIA was not required, now that the proposed development is before them on appeal they have to consider the issue of EIA afresh. In that respect, I am authorised by the Minister for Environment, Sustainability and Housing to determine whether the proposed development is EIA development.



BUDDSODDWR MEDWY FODR
DYNISTOR EN FIZIOL

Parc Cathays • Cathays Park
Caerdydd • Cardiff
CF10 3NQ

Ffôn • Tel 029 2082 3489
Ffacs • Fax 029 2082 5622
Cert.llythertand@wales.gsi.gov.uk

4. The development proposed is the "Erection of new industrial building and installation of 9MW fuelled renewable energy plant at Land at Woodham Road, Barry". In the direction of 9 July 2009 the view was expressed that that development fell within the description of paragraph 10 of Schedule 1 to the 1999 Regulations. Further consideration has been given to this issue and the conclusion has been reached that the description contained in paragraph 11(b) of Schedule 2 to the 1999 Regulations would be more appropriate to the proposed development. This conclusion has been reached in the light of there being no definition of incineration in the EIA Directive or the Waste Framework Directive; whether incineration includes treatments such as pyrolysis or gasification for the purposes of the EIA Directive is not settled and it being arguable in this case whether the incineration involved in this process is the incineration of the wood or the incineration of the gas.

5. As indicated in the direction of 9 July 2009, the principal consideration here is the general objective of the EIA Directive, namely that projects likely to have significant effects on the environment should be made subject to an assessment of their effects.

6. With that in mind we have consulted Environment Agency Wales on the need for the proposed development to be subject to EIA and their advice is as follows:-

"It is our opinion that Environmental Impact Assessment (EIA) is not required in this instance. We do not consider the proposal to be in a sensitive area, and we do not expect significant environmental impacts from the proposed process. This decision is based upon the specific issues we've addressed within our remit."

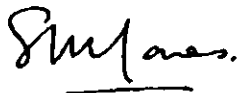
7. Having considered the papers before me, the advice from Environment Agency Wales and the criteria in Schedule 3 to the 1999 Regulations I do not consider that the development would be likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

8. Accordingly, in exercise of the authority referred to in paragraph 3 above and the powers provided by regulations 9(1) and 6(4) of the 1999 Regulations, I hereby direct that the development in respect of which approval was sought by application reference number 2008/01203/FUL is not EIA development.

9. Under Regulation 20(1) of the 1999 Regulations you should take steps to secure that this screening direction is placed on Part 1 of the Planning Register in relation to the application in question. I would be grateful if you could do so to ensure that the Welsh Ministers' view is publicly available.

10. This letter has been copied to Paul Sedgwick of Sedgwick Associates and the planning Inspectorate.

Yours faithfully,



S M JONES
Deputy Head
Decision Branch
Planning Division

Signed under authority of the
Minister for Environment, Sustainability and Housing,
one of the Welsh Ministers

THE VALE OF GLAMORGAN COUNCIL

Town and Country Planning Act 1990
Town and Country Planning (General Development Procedure) Order 1995

REFUSAL OF PLANNING PERMISSION

Agent:
Oaktree Environmental Limited,
Mr. Marco Muia,
Unit 5, Oasis Park,
Road One,
Winsford Industrial Estate,
Winsford,
Cheshire.
CW7 3RY

Applicant:
Sunrise Renewables Limited,
Mr. David Heath,
Gilbert Wakefield House,
67, Bewsey Street,
Warrington.
WA2 7JQ

Erection of new industrial building and installation of 9MW fuelled renewable energy plant at Land at Woodham Road, Barry

In accordance with the application and plans registered on 21 January 2009 the Council in pursuance of its powers under the above mentioned Act and Order hereby **REFUSES TO PERMIT** the proposed development for the following reason(s):

1. The proposed site for the energy plant, by reason of its proximity to nearby residential properties (especially those at an elevated height to the north), is considered to be unacceptable and resulting in an adverse impact on local residential amenity by reason of impacts relating to noise, traffic and pollution from the proposal, as well as a general adverse impact on the character of the area. Accordingly, the proposal is considered to be contrary to Policies WAST2, ENV27, ENV29, EMP2, EMP3 and TRAN11 of the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011.
2. The site is located in close proximity to Barry Waterfront, which is a key development site for the town of Barry and the Vale of Glamorgan as a whole, where the Council is seeking to encourage a high quality maritime development which makes an effective and positive contribution to the social, economic and environmental wellbeing of the community. By reason of the nature of the use, its associated environmental impacts and the poor public perception of such developments, it is considered that the siting of the proposed energy plant in its proposed location would represent a retrograde step for the Council's aspirations for the Waterfront, adversely affecting the amenities of the area and the future attraction of the development. Accordingly the proposal would fail to accord with the objectives of Policies ENV25 and ENV27 of the Vale of Glamorgan Adopted Unitary Development Plan 1996-2011 and the aspirations as detailed in the approved Barry Waterfront Development Principles Supplementary Planning Guidance.

Application No. 2008/01203/FUL

Dated: 31 July 2009

A handwritten signature in black ink, appearing to read "D. R. Thomas", written over a horizontal line.

Head of Planning and Transportation

**IT IS IMPORTANT THAT YOU SHOULD READ THE NOTES
ATTACHED TO THIS FORM.**

The Planning Inspectorate



Further information about us and the planning appeal system is available on our website www.planning-inspectorate.gov.uk



For official use only
Date Received

13/10/09

PLANNING APPEAL

If you need this document in large print, on audio tape, in Braille or in another language, please contact our helpline on 0117 372 6372.

Please use a separate form for each appeal

Your appeal and essential supporting documents must reach the Inspectorate within 6 months of the date shown on the Local Planning Authority's decision notice (or, for 'failure' appeals, within 6 months of the date by which they should have decided the application).

Before completing this form, please read our booklet 'Making your planning appeal' which was sent to you with this form.

WARNING: If any of the 'Essential supporting documents' listed in Section J are not received by us within the 6 month period, the appeal will not be accepted.

PLEASE PRINT CLEARLY IN CAPITALS USING BLACK INK

A. APPELLANT

The name of the person(s) making the appeal must appear as an applicant on the planning application form.

Name

Organisation Name (if applicable) SUNRISE RENEWABLES LTD

B. AGENT (if any) FOR THE APPEAL

Name PAUL SEDGWICK

Organisation Name (if applicable) SEDGWICK ASSOCIATES

Your Reference SA/4016

C. LOCAL PLANNING AUTHORITY (LPA)

Name of the LPA THE VALE OF GLAMORGAN COUNCIL

LPA's application reference no. 2008/01203/FUL

Date of the planning application

Date of the LPA's decision notice (if issued) 31.07.09

RECEIVED

13 OCT 2009

D. APPEAL SITE ADDRESS

Address LAND AT WOODNAM ROAD

BARRY

Postcode

Note: Failure to provide the full postcode may delay the processing of your appeal.

**ENVIRONMENTAL
AND ECONOMIC
REGENERATION**

E. DESCRIPTION OF THE DEVELOPMENT

Please enter details of the proposed development. This should normally be taken from the planning application form, but if the application was revised while it was with the local planning authority for consideration, you may enter a description of the revised scheme. Please enclose a copy of the LPA's agreement to the change.

ERECTION OF NEW INDUSTRIAL BUILDING
AND INSTALLATION OF 9MW FUELLED
RENEWABLE ENERGY PLANT

Size of the whole appeal site (In hectares) 0.77

Area of floor space of proposed development (in square metres) 2700

Has the description of the development changed from that entered on the application form? YES NO

Is flooding an Issue? YES NO

Does the development affect the setting of a listed building? YES NO

Is the appeal site within an Area of Outstanding Natural Beauty? YES NO

Does the site lie within a conservation area? YES NO

Does the site lie within a green belt/green wedge? YES NO

F. REASON FOR THE APPEAL

This appeal is against the decision of the LPA to: Please tick ONE box only

1 Refuse planning permission for the development described in Section E. 1

2 Grant planning permission for the development subject to conditions to which you object. 2

3 Refuse approval of the matters reserved under an outline planning permission. 3

4 Grant approval of the matters reserved under an outline planning permission subject to conditions to which you object. 4

5 Refuse to approve any matter required by a condition on a previous planning permission (other than those in 3 or 4 above).

OR

6 The failure of the LPA to give its decision within the appropriate period (usually 8 weeks) on an application for permission or approval.

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G. CHOICE OF PROCEDURE

CHOOSE ONE PROCEDURE ONLY

You should start by reading our booklet 'Making your planning appeal' which explains the different procedures used to determine appeals. In short there are 3 possible methods:- written representations, hearings and inquiries. You should consider carefully which method suits your circumstances.

Please note that when we decide how the appeal will proceed we will take into account the LPA's views. ✓

1 WRITTEN REPRESENTATIONS W

This is normally the simplest, quickest and most straightforward way of making an appeal. Three out of every four people making an appeal choose this method. The written procedure is particularly suited to small-scale developments (e.g. extensions of buildings, individual houses or small groups of houses, appeals against conditions and change of use). It is also very popular with people making their own appeal without professional help. The process involves the submission of written 'grounds of appeal' followed by a written statement and any supporting documents. It also provides an opportunity to comment in writing on the Local Planning Authority's reasons for refusing permission (or failing to determine the application). An Inspector will study all of the documents before visiting the appeal site/area and issuing a written decision.

NOTE: The Inspector will visit the site unaccompanied by either party unless the relevant part of the site cannot be seen from a road or other public land, or it is essential for the Inspector to enter the site to check measurements or other relevant facts.

- a) If the written procedure is agreed, can the relevant part of the appeal site be seen from a road, public footpath, bridleway or other public land? YES
NO
- b) Is it essential for the Inspector to enter the site to check measurements or other relevant facts? YES
NO

If the answer to 1b is 'YES' please explain

2 HEARINGS H

This process is likely to be suited to slightly more complicated cases which require detailed discussion about the merits of a proposal. Like the written procedure, the process starts with the submission of 'written grounds of appeal' followed by a full written statement of case and an opportunity to comment in writing on the Local Planning Authority's reasons for refusing permission which the Local Planning Authority and the appellants(s) will be represented. Members of the public, interested bodies (e.g. Community/Town Councils) and the press may also attend. At the hearing the Inspector will lead a discussion on the matters already presented in the written statements and supporting documents. The Inspector will visit the site/area and issue a written decision in the same way as the written procedure.

Although you may prefer a hearing the Inspectorate must consider your appeal suitable for this procedure.

3 INQUIRIES I ✓

This is the most formal of procedures. Although it is not a court of law the proceedings will often seem to be quite similar as the parties to the appeal will usually be legally represented and expert witnesses will be called to give evidence. Members of the public and press may also attend. In general, inquiries are suggested for appeals that:

- are complex and particularly controversial;
- have caused a lot of local interest;
- involve the need to question evidence through formal cross-examination.

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H. GROUNDS OF APPEAL

If you have requested the written procedure, please provide your **FULL** grounds of appeal.

If you have requested a hearing or an inquiry, you do not have to provide your full grounds of appeal. You can provide only a brief outline of your grounds, but it must be sufficiently detailed and comprehensive to enable the LPA to prepare their case.

Refer to our booklet 'Making your planning appeal' for help.

Please continue on a separate sheet if necessary.

SEE SEPARATE SHEET.

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Grounds of Appeal

The application was recommended for approval but refused by the planning committee. There is a continuing need for renewable schemes such as that proposed; policy at national, regional and local level presumes in favour of such proposals subject to ensuring there are no unacceptable impacts upon a range of interests; the UDP seeks to locate such facilities on existing employment sites such as the Woodham Road site.

In its reasons for refusal, the LPA states that the proposed plant will have an adverse impact on local residential amenity by reason of impacts relating to noise, traffic and pollution from the proposal, as well as a general adverse impact on the character of the area. Documents submitted in support of the planning application demonstrated that there would be no adverse impact from noise, traffic or pollution and there were no objections to the proposals from Pollution Control or the Highway Authority. The proposed plant will reflect the industrialised character and appearance of the surrounding area.

The second reason for refusal states that the proposals would represent a retrograde step for the Council's aspirations for the Waterfront. The Docks are characterised by large industrial buildings; the appeal proposals would result in an industrial building in an industrial landscape and so will not look out of place. Low grade Nissen hut employment uses stand between the appeal site and the edge of the dock regeneration area. The appeal proposals will have no adverse impact on Barry Waterfront.

The appeal proposals would represent a sustainable, renewable energy proposal for which there is a continuing need. The interests of local residential and visual amenity and highway safety will be protected and no other material considerations will be compromised. The appeal proposals should therefore be allowed.

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I. APPEAL SITE OWNERSHIP DETAILS

We need to know who owns the appeal site. If you do not own the appeal site or if you own only a part of it, we need to know the name(s) of the owner(s) or part owner(s). We also need to be sure that any other owner knows that you have made an appeal. **YOU MUST TICK WHICH OF THE CERTIFICATES APPLIES.**

Please read the enclosed Guidance Notes if in doubt.

Please tick **ONE** box only ✓

If you are the sole owner of the whole appeal site, certificate A will apply:

CERTIFICATE A

A

I certify that, on the day 21 days before the date of this appeal, nobody except the appellant, was the owner (see Note (1) of the Guidance Notes for a definition) of any part of the land to which the appeal relates:

OR

CERTIFICATE B

B ✓

I certify that the appellant (or the agent) has given the requisite notice (see Guidance Notes) to everyone else who, on the day 21 days before the date of this appeal, was the owner (see Note (1) of the Guidance Notes for a definition) of any part of the land to which the appeal relates, as listed below:

Owner's Name

Date the notice was served

ASSOCIATED BRITISH PORTS
(ABP) BARRY

Please supply address(es)

121009

on personal

details page

CERTIFICATES C and D

C&D

If you do not know who owns all or part of the appeal site, complete either Certificate C or Certificate D enclosed with the accompanying Guidance Notes and attach it to the appeal form.

AGRICULTURAL HOLDINGS CERTIFICATE (This has to be completed for all appeals)

We also need to know either the appeal site forms part of an agricultural holding. Please tick either (a) or (b).

If the appellant is the sole agricultural tenant, (b) should be ticked and 'not applicable' should be written under 'Tenant's name'.

a) None of the land to which the appeal relates is, or is part of, an agricultural holding: a ✓

OR

b) The appeal site is, or is part of, an agricultural holding and the appellant (or the agent) has given the requisite notice to every person (other than the appellant) who, on the day 21 days before the date of the appeal, was a tenant of an agricultural holding on all or part of the land to which the appeal relates as listed below: b

Tenant's Name

Date the notice was served

Please supply address(es)

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