

Dwr Cymru Welsh Water

**Morfa Bychan Wastewater
Treatment Works**

**ENVIRONMENTAL
STATEMENT**

MAY 2005

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Morfa Bychan Wastewater Treatment Works

ENVIRONMENTAL STATEMENT

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Capita Symonds Ltd
Clarendon House
Stamford New Road
Altrincham
Cheshire
WA14 1BY

Tel: 0161 925 5900
Fax: 0161 928 0559

Prepared by:	Date:
GS	15/05/05
Checked by:	Date:
HJ	15/05/05
Approved by:	Date:
HJ	15/05/05

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MORFA BYCHAN WASTEWATER TREATMENT WORKS ENVIRONMENTAL STATEMENT - NON TECHNICAL SUMMARY

INTRODUCTION

1. Dwr Cymru Welsh Water (DCWW) proposes to construct a new Wastewater Treatment Works (“the WwTW”) on land on, and adjacent to, the existing Pumping Station at Ffordd Morfa Bychan.
2. Macerated crude (raw) sewage arisings from the Morfa Bychan catchment are presently discharged, into Tremadog Bay via an existing long sea outfall. The proposed development will provide appropriate sewage treatment facilities for the catchment, in accordance with the requirements of the Urban Wastewater Treatment Regulations.
3. The site of the proposed WwTW is shown on Figure 1 and was selected following careful consideration of a number of scheme options.
4. The development will reduce the sewage pollution incidents and provide an opportunity for the Local Authority to pursue Blue Flag accreditation for the beach at Morfa Bychan and Black Rock Sands.

PROPOSED DEVELOPMENT

5. The proposed development comprises an activated sludge process, which will require:
 - Inlet Works
 - Storm Tank
 - Aeration Lanes
 - Final Settlement Tanks
 - Returned Activated Sludge (RAS)/Surplus Activated Sludge (SAS) Chamber
 - Sludge Thickening Plant
 - Sludge Holding Tank
 - Liquor Return Pumping Station
 - Odour Control
6. In addition to the above, the application includes a new junction and access roads to both the proposed treatment works and to the Bourne Leisure boat storage area.
7. The application also includes fencing, gating, landscaping and bunding.

ENVIRONMENTAL EFFECTS

8. **Tourism and Recreation** – The provision of the Wastewater Treatment Works will help to improve the quality of coastal water to the benefit of Tourism and Recreation at Black Rock Sands beach. In addition the local economy will continue to benefit from employment and expenditure within the area from incoming visitors and tourists.
9. **Ecology** – No protected flora or fauna of national importance was identified to be present on the site. The proposed development will not adversely affect any features of ecological interest.
10. **Odour** – The proposed WwTW has been designed to limit odour generation and emissions. Odour emissions will not exceed industry standards. Odour modelling shows that discernible odour levels would be tightly constrained and not exceed the application site boundary.
11. **Archaeology** – The proposed development will not affect any known sites of archaeological interest.
12. **Visual** – The site is framed from most views by existing development and planting. Earth bunding and native planting will soften the impact of the Scheme.
13. **Noise** – A noise assessment has been undertaken and indicates that noise arising from the proposed development is unlikely to result in a material change in noise levels at the nearest residential properties.

MITIGATION

14. The design of the proposed WwTW has been developed and has been progressively refined with mitigation measures incorporated to help offset potential adverse impacts.
15. The scheme was revised further following views expressed at the meeting with the Friends of Morfa Bychan, a two-day public exhibition and individual consultations with nearby residents.
16. Mitigation measures would include native planting, coppicing outside the bird breeding season, site drainage and defined construction operations that limit noise and dust.

1. INTRODUCTION

Coverage:	1.1	Background
	1.2	Justification for the Scheme
	1.3	Need for Planning Permission and Environmental Assessment
	1.4	Other Regulatory Controls
	1.5	Methodologies and Assessment

1.1. Background

1.1.1. Dwr Cymru Welsh Water (DCWW) proposes to construct a new Wastewater Treatment Works ("WwTW") on and adjacent to the site of the existing Pumping Station at Ffordd Morfa Bychan.

1.1.2. The site is located adjacent to the Greenacres Caravan Park towards the western edge of Morfa Bychan.

1.1.3. The location of the proposed WwTW is shown on Figure 1.

1.1.4. Presently, the sewage arising from the Morfa Bychan catchment is macerated and pumped directly to sea via long sea outfall into Tremadog Bay.

1.1.5. The proposed WwTW will provide appropriate treatment of sewage arising from the community of Morfa Bychan including the various caravan parks that have a main sewerage connection.

1.1.6. The proposed WwTW lies within the Dwyfor Administration Area of Gwynedd Council.

1.2. Justification of the Scheme

1.2.1. The adjacent Black Rock Sands is an EC designated bathing beach. Sampling for faecal coliforms at sea at this beach have resulted in 5 sample failures in 2001, 3 failures in 2002 and 4 failures in 2004. To maintain a bathing beach standard there must be no more than 4 failures per bathing season. Therefore Black Rock Sands could easily lose its bathing water status.

1.2.2. The proposed WwTW will enable DCWW to satisfy the requirements of the urban wastewater treatment regulations, which are to provide appropriate treatment for wastewater being discharged to coastal waters.

1.3. **Need for Planning Permission and Environmental Assessment**

1.3.1. The construction of the proposed WwTW requires planning permission under the provisions of Section 57 of the Town and Country Planning Act.

1.3.2. The proposed development falls within Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) Regulations 1999 and a formal Environmental Assessment is not, therefore, mandatory.

1.3.3. However, DCWW acknowledges the sensitive nature of the proposed development and has therefore commissioned the preparation of an Environmental Assessment

1.3.4. This Environmental Statement reports on the likely environment effects of the proposed WwTW during both the construction and operational phases.

1.3.5. Capita Symonds has prepared the Environmental Statement for DCWW with inputs from Meica Process Ltd on engineering matters, on archaeology by Gwynedd Archaeological Trust, and on odour emissions by H and M Environmental.

1.3.6. In developing the current proposals and undertaking the environmental assessment consultations were carried out with the Gwynedd Archaeological Planning Service, CCW, Environment Agency, various departments of Gwynedd Council, together with Residents of Morfa Bychan and other organisations and bodies.

1.3.7. The Environmental Statement is based upon the following drawings:

- CS-002863 SP01 – Application Site Plan
- C979-2152-Rev A – Existing Site Layout
- C979-2153-Rev A – Existing Site Elevations
- C979-2151-Rev G – Proposed Site Elevations
- C979-2150-Rev F – Proposed Site Layout
- CS-002863\PMP\01 Rev F – Proposed Mitigation Plan
- CS-002863\EP\01 Rev C – Proposed Elevations

1.3.8. The following matters are addressed in the Environmental Statement:

- Project Description
- The Site and Its Environment

- Environmental Effects
- Mitigation Measures

1.4. **Other Regulatory Controls**

1.4.1. The quality of the treated effluent that will be discharged from the proposed WwTW into the sea, via the existing long sea outfall, will be regulated by the Environment Agency by way of a Discharge Consent. This Consent will be issued in consultation with CCW and will take into account the need to safeguard the marine environment.

1.4.2. Effluent from the proposed WwTW will discharge into Tremadog Bay, which is designated as the Lleyn Peninsula and Sarnau cSAC and SSSI. An 'appropriate assessment' of the likely environmental impacts of the discharge may be required under the provisions of the Conservation (Natural Habitats and Conservation) Regulations 1994.

1.5. **Methodologies and Assessment**

1.5.1. This section indicates the methods adopted to assess the impact of the scheme with particular regard to ecology, archaeology, landscape, noise and odour.

Ecology

1.5.2. The Phase 1 habitat survey was conducted using standard methodology as described in the 'Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit' (JNCC 1990).

1.5.3. The habitat survey comprised a site survey and desk exercise.

1.5.4. The site survey was undertaken to identify:

- Key areas of habitat within the site;
- Areas or habitats within the site that are of particular interest for nature conservation and which may require further investigation;
- Habitats suitable for species which are known to inhabit such areas, e.g. Marsh Fritillary Butterflies.

- 1.5.5. The site survey and the assessment of suitable sites for Marsh Fritillary were undertaken in December 2004.
- 1.5.6. The objectives of the desk study were to identify:
- Sites of statutory and non-statutory nature conservation interest within 5km of the proposed WwTW;
 - Records of protected species and other ecological features within 1km of the proposed WwTW.
- 1.5.7. Consultations were undertaken with Countryside Council for Wales (CCW), North Wales Wildlife Trust, Gwynedd County Council, North West Wales Amphibian and Reptile Group, Gwynedd Bat Group and Gwynedd Badger Group.
- 1.5.8. The habitats identified have been evaluated using criteria as described in the IEEM Draft Guidelines For Ecological Impact Assessment (2002). This assigns a level of importance to the identified habitat and its ecological value in a geographical context, as follows:

International	-	Of European importance.
National	-	Of UK importance.
Regional	-	Of importance in Wales.
County	-	Of importance in Gwynedd.
District	-	Of importance in the Llyn Peninsula.
Parish	-	Of importance in the immediate area.

Archaeology

- 1.5.9. An archaeological assessment of the application site was undertaken by Gwynedd Archaeological Trust using methodology approved in accordance with a brief prepared by Gwynedd Archaeological Planning Services.
- 1.5.10. The assessment comprised a desk-top study and field walkover.
- 1.5.11. The desktop study consisted an inspection of the documents, which comprise the Sites and Monuments Record (SMR) and include historical mapping and aerial photos.
- 1.5.12. The walkover survey comprised a visit and examination of the site and this was undertaken on 13 January 2005.

Landscape

1.5.13. The visual assessment followed recommendations within 'Guidelines for Landscape and Visual Assessment' (2nd edition) published by the Landscape Institute and the Institute of Environmental Management and Assessment.

1.5.14. Local and mid range views were assessed as well as the sensitivity of the affected landscape and any specific visual characteristics. The affect on existing properties was assessed individually.

1.5.15. The visual impacts of the proposed scheme identifies:

- Affected Receptor
- Sensitivity of the Receptor
- Magnitude of the Impact
- Impact Rating

1.5.16. The sensitivity is graded high, medium and low and are categorised as follows:

- High – residential properties, footpaths, landscapes of distinctive character only susceptible to small changes
- Medium – sporting and recreational facilities, landscapes of moderate value able to tolerate changes
- Low – commercial/industrial sites, unimportant landscapes tolerant of substantial change.

1.5.17. The magnitude of the change is categorised as follows:

- High – majority of viewers affected, major change of view, notable change in landscape characteristics
- Medium – many viewers affected, moderate change in view, moderate localised changes
- Low – few viewers affected, minor change in view, virtually imperceptible change.

1.5.18. The sensitivity of the view/landscape and magnitude of the change can be combined to attain the impact of the proposed development which can be defined as follows:

- Substantial impact – where the proposed scheme would cause significant change to the existing view, in areas or receptors of high sensitivity and would experience a high/medium intrusion of, or change in, character or high magnitude of change in an area of high sensitivity.
- Moderate impact – where the scheme would cause noticeable change in the existing view in areas or receptors of high/medium sensitivity which would experience medium intrusion or change in character, or high magnitude in an area of low sensitivity
- Slight impact – where the scheme would cause a perceptible change in the existing view in areas or receptors of medium/low sensitivity which would experience localised damage or loss to specific landscape elements/features or minor intrusion over a wider area.

1.5.19. The visual assessment was undertaken on 9 December 2004, the weather was cloudy but with clear visibility.

Noise

1.5.20. The likely noise impacts of the proposed scheme have been assessed by predicting the noise levels at the closest residential locations and comparing those predicted noise levels to existing background noise levels.

1.5.21. A single measurement location was chosen between the existing pumping station and Ffordd Morfa Bychan. This point is representative of the nearest caravans and residential properties.

1.5.22. Background noise measurements were taken on 2 December 2004 between 16.00 hours and 00.00 hours.

1.5.23. Background noise measurements were taken in accordance with BS4142:1997.

1.5.24. Predicted noise levels from the proposed WwTW were calculated by using noise levels of the individual items of proposed plant, taken from the manufacturers' specification.

1.5.25. The noise prediction at the nearest sensitive receptor takes into account distance, absorption, duration and screening in line with BS5228.

Odour

- 1.5.26. The prediction for likely odour impacts have been calculated using AERMOD which is an updated derivative of ISCST3 (Industrial Source Complex Short-term). Using topographical and historical meteorological data (RAF Valley between 2000 and 2002) and calculated odour emission rates for each of the potentially odorous sources.
- 1.5.27. The dispersion model predicts average odour concentrations at identified points beyond the site boundary and dispersion rates depend on meteorological and topographical conditions.
- 1.5.28. Predicted emission rates are based to actual measured data from other Welsh Water sites.
- 1.5.29. The most common approach to use to characterise odour is the 'odour unit'. One odour unit (1 O_U/m³) is defined by the European Committee for Standardisation as the equivalent of 40ppb of n-butanol. This is detectable by 50% of the members of a selected, trained odour panel. Odour annoyance is generally considered to occur at five odour units (5 O_U/m³) above background levels and this indicates odour concentrations where odour annoyance may become an issue for a normal population.
- 1.5.30. Odour annoyance is associated with long term, intermittent exposure of a population to odour. The annoyance is also quantified in terms of the frequency of occurrence to which the population is exposed. For instance, UK studies indicate that annoyance may occur at an exposure of 5 odour units above background for more than 2% of the hours of the year and, leading to complaint, likely to occur at and an exposure of 10 odour units above background for more than 2% of the hours of the year.
- 1.5.31. The odour model highlights the areas encompassed by the 5 and 10 odour unit contours around the odour sources and provides an odour dispersal for the worse case scenario, i.e. the highest possible odour concentrations with the 'worst' meteorological conditions for odour dispersal.

2. DEVELOPMENT AND SCHEME DESCRIPTION

Coverage:	2.1	Purpose of the Scheme
	2.2	Evaluation of Transfer Scheme Opportunities
	2.3	Evaluation of Areas Available Within the Catchment
	2.4	Evaluation of Design Options
	2.5	The Proposed Development
	2.6	Construction Method

2.1. Purpose of the Scheme

2.1.1. The purpose of the Morfa Bychan wastewater treatment scheme is to provide appropriate secondary treatment to sewage arising from the Morfa Bychan catchment.

2.1.2. The scheme will also provide additional storage to the sewerage network in the Morfa Bychan catchment, which is close to maximum capacity and occasionally overflows causing local flooding.

2.1.3. The proposed WwTW is a key element of the investment that is required in the Morfa Bychan catchment to provide environmental benefit and storm storage necessary to accommodate flow from the network and help relieve flooding issues.

2.2. Evaluation of Transfer Scheme Opportunities

2.2.1. Initial investigations were undertaken into the options of transferring the wastewater arisings to the existing WwTWs at either Porthmadog or Criccieth ("pump away option"). These options were discounted since:

- The additional pollutant volume and load could not be adequately dealt with by the existing assets at Criccieth or Porthmadog
- The topography of the pipeline routes would lead to significant public and environmental disruptions
- Transfer using pumping mains is considered to be prone to poor reliability leading to additional environmental risk

2.2.2 Therefore the transfer option was not considered to be acceptable.

2.3. Evaluation of Scheme Options Within Catchment

2.3.1. After the 'Pump-Away' option was discounted, an area based selection process for the proposed WwTW site was undertaken.

2.3.2. A sieve map was produced to identify all constraints within the catchment, thus highlighting all land potentially available for the proposed WwTW site. Constraints highlighted for the purpose of this search included existing developed land, the SSSI/cSAC designation, National Trust owned land and land with topographical constraints.

2.3.3. The sieve map highlighted six areas potentially available for development and is shown on Figure 2.

2.3.4. The catchment is further constrained by additional factors such as landforms, existing development, land ownership and ecological designations.

2.3.5. The land to the north, east and west of Morfa Bychan is rocky, undulating terrain, which could not accommodate a WwTW without substantial levels of pumping. This land is denoted on Figure 2 as green hatching.

2.3.6. The coastline and estuary to the south of Morfa Bychan is designated as a SSSI and cSAC. There would be a strong presumption against development in this designation.

2.3.7. An area of land to the east of Morfa Bychan is owned by the National Trust. There is a presumption against development on this land. In addition, the National Trust have powers to veto Compulsory Purchase Orders.

2.3.8. Other land discounted included existing developed land, including housing and commercial properties as well as 'softer' uses, such as golf courses and campsites.

Area 1

2.3.9. This is an area of relatively flat land on higher ground to the west of Morfa Bychan.

2.3.10. This area is accessed by narrow and winding lanes inaccessible to construction traffic, subsequent operational tanker movements, and is adjacent to St Michael and All Saints Churches.

- 2.3.11. The land is predominantly grazed and is interspersed with stonewalls. The area affords a prominent location overlooking Morfa Bychan, with views of Snowdonia beyond. A development in this location would be visible from Morfa Bychan and the adjacent coastline.
- 2.3.12. This area is considered unfeasible due to the poor access and the visual impact that would result from the proposed development.
- 2.3.13. In addition, significant pumping and extension to the existing network would be required resulting in the area being less sustainable.

Area 2

- 2.3.14. Area 2 lies on the western edge of Morfa Bychan, is relatively flat and is bi-sected by a small stream. The flora on the site indicates that the area is waterlogged at a number of times during the course of the year.
- 2.3.15. The southerly edge is bounded by residential properties and is visually prominent from a number of locations along Ffordd Morfa Bychan.
- 2.3.16. Whilst the extent of the seasonal water logging is not known, it is likely to restrict the number of possible locations for a WwTW.
- 2.3.17. In addition, significant pumping and extension to the existing network would be required resulting in a less sustainable development.
- 2.3.18. To this end, sites in this area that are not prone to flooding however would be visually prominent and would be in close proximity to residential properties.

Area 3

- 2.3.19. Area 3 comprises an existing pumping station and long sea outfall. The adjoining land and is owned by Dwr Cymru Welsh Water.
- 2.3.20. The area is flat and covered in gorse. It is bounded on the west by a caravan park, to the south by a ropewalk park, to the east by a boat park and to the north by scrubland with residential properties beyond.

- 2.3.21. The provision of bunding, additional planting and the retention of some of the existing gorse could adequately screen a WwTW in this location. The area has the benefit of being immediately adjacent to the existing long sea outfall and at the confluence of the existing sewerage network.
- 2.3.22. Development in this area will not require additional pumping or network modifications to receive sewage arisings.

Area 4

- 2.3.23. Area 4 comprises an extension of the existing pumping station in an easterly direction immediately adjacent to the ropewalk park and swimming pool at the Greenacres Caravan Park.
- 2.3.24. This area potentially represented the most appropriate location for a WwTW adjacent to the existing operational land and the existing outfall.
- 2.3.25. In addition this site could have been adequately screened from neighbouring properties and odour modelling showed that any odours would be retained within the operational land.
- 2.3.26. This area was, however, discounted as part of the area owned by Bourne Leisure includes a Restrictive Covenant preventing WwTW development.

Area 5

- 2.3.27. Area 5 comprises an area between the Village of Morfa Bychan and the sand dunes. The area is a mixture of scrubland and seasonal recreation land. The area is also crossed by streams and drainage ditches.
- 2.3.28. The southern and eastern parts of the area were discounted due to its immediate proximity to the designated SSSI/cSAC. The western and northern parts of the area were discounted due to a high water table and close proximity to residential properties.
- 2.3.29. Development of this area would require significant network modifications and provision of additional pumping stations within the catchment.
- 2.3.30. The access to the site would have been detrimental to highway safety. In places there is no footpath access along Beach Road, which would create vehicular / pedestrian conflict.

Site 6

2.3.31. Area 6 comprises the practice range for Porthmadog Golf Course and lies to the east of Morfa Bychan.

2.3.32. This area occupies a prominent location adjacent to the main road into Morfa Bychan.

2.3.33. The area was discounted as it was considered unlikely that the site would be released for development by the present owners/occupiers. In addition a WwTW in this location would be visually prominent and it is unlikely that suitable and safe vehicular access could be created due to a sharp bend in the road.

Summary

2.3.34. The table below summarises the six identified areas of search with respect to the opportunity of providing sustainable development. Areas 1, 2, 4, 5 and 6 have been discounted as unsuitable for the proposed development.

Table 1: Alternative Site Locations

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Existing Land Use	Agricultural, grazing	Scrub land, Camp Site, Bog	Scrub, gorse, pumping station.	Scrub, gorse, pumping station.	Golf course practise area	Scrub land, seasonal recreational land, dunes.
Topography and Ground Conditions	Relatively flat, few bedrock protrusions	Relatively flat, bi-sected by stream, seasonally waterlogged	Flat.	Flat	Flat, outcrop to rear	Flat, crossed by drainage ditches, possible high water table.
Access to Road Network	Very difficult, single track, winding lane, poor visibility	Easy access to main road through Morfa.	As existing	As existing	Possible highway safety issues (visibility)	Acceptable
Access to Outfall	Significant distance to existing outfall	Close to existing outfall infrastructure	As existing	As existing	Would require rising main in road verge through Morfa	Will require transfer, rising mains and pumping station.
Ecological and Archaeological Issues	Possible archaeological issues (check SMR), unlikely to present ecological issues	Wetland and gorse habitat. Possible ecological and archaeological issues.	Unlikely	Unlikely	Unlikely	Loss of trees and drainage ditches
Residential Impacts	None	Very close to a number of residential properties.	Bound on four side by caravans and dwellings	Close to residential properties	No close neighbours. But access may cause amenity issues.	Close to a number of residential properties
Vehicle Movement	Very difficult location to build WTW	Acceptable.	As existing	As existing	Access to main road but possible safety issues	Good access for construction vehicles
Visual Impact	Very prominent	Prominent location on	Possibility that the site could	Possibility that the site could	Prominent location at	Loss of trees would increase

	location, visual impact would be high	edge of Morfa.	be adequately screened.	be adequately screened.	gateway to Morfa	prominence of site
Likely Scheme Cost	High, cost of pumping to site	Land purchase.			Rising Main and Pumping Station	Land purchase, drainage issues, pipelines, pumping stations
Additional Pump Station	One or Two	One	No	No	One or Two	One or two
Access to Alternative Outfall	No	No	No	No	No	No
Agricultural Viability	Possibly	Unlikely	No	No	No	None
Land Ownership	Farmer and possibly tenant	Farmer and possibly tenant, camp site owner	Welsh Water, Bourne Leisure	Welsh Water, Bourne Leisure	Porthmadog Golf Club	3 rd Party
Likely Objectors	Cadw, Church, Parishioners	Neighbours	Neighbours and Bourne Leisure	Neighbours	Golf Club and its Members	Residences, Garreg Coch Caravan Park

In addition Area 3 has been identified as a suitable site for the development of a WwTW for the following principle reasons:

- No additional network modifications required
- Most suitable location for storm storage to address catchment flooding issues
- Access to existing long sea outfall without additional pumping requirement
- Least environmental disruption
- Least visual impact
- Existing brownfield site/Dwr Cymru Welsh Water Operational Land

2.3.35. Chapter four of this report also highlights that this site would not cause any undue odour, visual or noise impacts on any nearby land uses.

2.4. Evaluation of Design Options

2.4.1. The plant and machinery for the proposed WwTW has been chosen in accordance with the following selection criteria in order to minimise possible environmental impacts on neighbouring land use:

- Least 'aggressive' odour product
- Treatment process solution with reduced odour impact
- Minimum noise level
- Optimised flow levels
- Land restriction requirements
- Height restrictions

2.4.2. Design options evaluated include:

- Biological filtration,
- Rotating Biological Contactors,
- Membrane Bio-Reactors
- Activated sludge.

2.4.3. The activated sludge process was selected as the most reliable and proven sewage treatment process with the lowest risk to the immediate environment with respect to odour and noise.

2.5. **The Proposed Development**

2.5.1. The proposed WwTW will comprise the following plant, machinery and accommodation works.

- Inlet Works
- Storm Tank
- Aeration Lanes
- Final Settlement Tanks
- Returned Activated Sludge (RAS)/Surplus Activated Sludge(SAS) Chamber
- Sludge Thickening Plant
- Sludge Holding Tank
- Liquor Return Pumping Station
- Odour Control Unit
- New junction layout onto Ffordd Morfa Bychan
- Access road for both the WwTW (including access to Bourne Leisure Boat Park)
- Security fencing
- Bunding and landscaping
- Acoustic Fencing

2.6. **Construction Method**

2.6.1. The construction period is estimated at 6 months.

2.6.2. The development will commence with construction of the junction and site access roads. The temporary site buildings would utilise the existing boat-park land located away from residential properties.

2.6.3. The sequence of works will comprise:

- Site clearance (gorse coppicing prior to bird breeding season);
- Excavation;
- Lay foundations and bases;
- Erection of buildings/tanks/plant;
- Installation of pipelines and cable ducts;
- Installation of mechanical plant and electrics;
- Commissioning and performance testing.

3. THE EXISTING ENVIRONMENT

Coverage:	3.1	The Wastewater Treatment Works Site and Environs
	3.2	Landscape
	3.3	Ecology
	3.4	Water Quality and Drainage
	3.5	Cultural Heritage
	3.6	Recreation and Tourism
	3.7	Odours
	3.8	Traffic
	3.9	Planning Policies

3.1. The Wastewater Treatment Works Site and Environs

3.1.1. This assessment has been undertaken within Area 3, where the WwTW site will be located. The site contains an existing pumping station, which includes a control building, plant and machinery, scrubland, fencing and access to the long sea outfall.

3.1.2. The remainder of the application site comprises gorse scrub land. There is an existing access to the site off Ffordd Morfa Bychan.

3.1.3. The application site is bounded on three sides (west, south and east) by Greenacres Caravan Park. To the west is an area of caravans. To the south is a ropewalk and indoor swimming pool / leisure complex, and to the east is the boat park with rented accommodation beyond. To the north is a row of four detached houses separated from the site by 3m high gorse scrub.

3.2. Landscape

3.2.1. The site and whole of the surrounding area lies within the Landscape Conservation Area as designated in the Dwyfor Local Plan 1998.

3.2.2. The designation covers a significant proportion of the County and refers to land, which is important to the natural, and landscape features located outside the Area of Outstanding Natural Beauty.

- 3.2.3. The current viewpoints and receptors were identified within a 1km radius of the site include:
- Residential properties to the north and east of the site
 - Open field and farmland to the north of the site
 - Ffordd Bychan, the main route through Morfa Bychan which passes to the north of the site
 - Elevated footpaths on land to the north of the site
 - Individual properties on elevated land to the north of the site
 - Fish farm at Glan y Morfa Mawr
 - Greenacre Caravan Park
 - Seasonal caravan and camping sites west and south of the site.
- 3.2.4. There are limited opportunities to view the existing DCWW pumping station and associated works at site due to the existing gorse bushes and scrub which are up to 3 metres in height.
- 3.2.5. This vegetation currently screens or breaks up views towards the site from Ffordd Morfa Bychan and forms visual barriers. In addition there is an existing bund to the south of the site and along part of the eastern section of the site. A narrow strip of scrub also lies to the west of the site.
- 3.2.6. The existing vegetation is evergreen and therefore there would be little variation in views of the site throughout the year.
- 3.2.7. Views into the site from further than 1km radius include Black Rock Headland to the west, Moel y Gest to the northeast and Snowdonia to the north and east, though these views are framed and partially concealed by existing development.
- 3.2.8. Due to the minor nature of the existing works, the existing dense screening and existing caravan site the current pumping station operation goes largely unnoticed, thus presenting minimal visual impact.
- 3.2.9. The impact of the site at night is negligible as the site is not lit and there are very few vehicular movements to and from the site during hours of darkness.

3.3. Ecology

3.3.1. The proposed WwTW site lies within 500 metres of the Lleyn Peninsula and Sarnau Candidate – Special Area of Conservation (cSAC) and is shown on Figure 2. This area is designated as a result the presence of a number of marine and semi-terrestrial features, inter alia:

- Coastal Lagoons
- Estuary
- Grey Seals
- Large Shallow Inlets and Bays
- Mudflats/Sandflats
- Sea Caves
- Bottlenose Dolphins
- Atlantic Salt Meadows
- Otters

3.3.2. The cSAC contains a number of sites of Special Scientific Interest (SSSI). The 575.5Ha Afon Glasyn SSSI is some 500 metres from the site of the proposed WwTW at its closest point and includes dune habitats in and around Morfa Bychan.

3.3.3. Greenacres Nature Reserve is located approximately 100 metres south west of the proposed WwTW. Species known to be present at the Reserve include common lizard, slow worm, common toad and palmate newt. 35 species of bird were identified, including 5 on the Red Data Bird (RDB) List of Birds of Conservation Concern, (Reed Bunting, Song Thrush, Sky Lark, Linnet and Starling.)

3.3.4. A potential county wildlife site is located approximately 250m east of the proposed WwTW. The site comprises a mosaic of dry heath acid and neutral grassland, which includes heather, cross leaved heath and western gorse.

3.3.5. The WwTW site itself is dominated by gorse scrub, which stands up to 3 metres in height. The gorse is dense and, as such, offers a potentially secure habitat for nesting birds and mammals. The development has recognised the importance of this habitat to support breeding birds and reptiles and in this respect retains the area of land to the north of the site in its natural condition.

3.3.6. This habitat would be further enhanced by the introduction of further planting and planted bunding, provided as part if the proposed development.

- 3.3.7. A particular assessment was undertaken to identify potential habitats for the Marsh Fritillary Butterfly, which is known to occur in the area.
- 3.3.8. The Marsh Fritillary requires the presence of Devil's Bit Scabious, as this is the larval food plant. There is no Devil's Bit Scabious present at the application site and, therefore, it is highly unlikely that breeding butterflies are present.
- 3.3.9. A small ditch runs along the western edge of the site. Otters are common in the area. It is unlikely that the ditch is used for otter foraging due to the existing human activity in the area. It is, however, a potential flight line for foraging bats and foraging for water voles and is therefore assessed as of County level importance.
- 3.3.10. The remainder of the site affords little, if any, opportunity for roosting bats.
- 3.3.11. This development will provide habitat for naturally occurring flora and fauna, enable support existing mammals and reptiles within the site and surrounding area.

3.4. Water Quality and Drainage

- 3.4.1. Currently the beach at Morfa Bychan is accredited as a Mandatory pass.
- 3.4.2. Black Rock Sands is an EC designated bathing beach. Sampling for faecal coliforms at sea at this beach have resulted in 5 sample failures in 2001, 3 failures in 2002 and 4 failures in 2004. To maintain a bathing beach standard there must be no more than 4 failures per bathing season
- 3.4.3. Part of the site falls within the 1 in 100 year fluvial floodplain, associated with the ditch adjacent to the western boundary of the site.

3.5. Cultural Heritage

- 3.5.1. A Desk Study and Walkover Surveys were undertaken and no sites of archaeological interest were identified within the site of the proposed WTWW.
- 3.5.2. The nearest known site of archaeological importance is the Church of St. Michaels and All Angels located some 600 metres to the northwest.

3.6. **Recreation and Tourism**

- 3.6.1. Morfa Bychan caters for a number of tourist and recreation-based activities. The Village accommodates a significant seasonal tourist population, who utilise local shops and businesses in addition to the static caravan parks and campsites in and around the Village.
- 3.6.2. The main tourist attractions in this area are the southern coastline of the Llyn Peninsula and the Snowdonia National Park.
- 3.6.3. As well as long-stay visitors, Morfa Bychan also attracts day trip visitors during the summer months.
- 3.6.4. There are a number of seasonal recreational facilities in and around the Village, including crazy golf and pitch and putt.
- 3.6.5. Porthmadog Golf Club provides a year-round recreation facility for members and visitors alike.
- 3.6.6. The site of the proposed WwTW is abutted by static caravan parks, which also include a ropewalk course and the Bourne Leisure indoor swimming pool/ leisure complex.
- 3.6.7. There are a number of footpaths within 500 metres of the proposed WwTW site. These are shown on Figure 5.
- 3.6.8. The existing arrangement of sewerage maceration and discharge via long sea outfall has the potential for adverse impact on local water sports.
- 3.6.9. There is insufficient treatment and storm storage to support the present levels of seasonal tourists. This may have an impact on the ability to receive, store and treat increased effluent levels without further investment.

3.7. **Odours**

- 3.7.1. DCWW has not received any recent complaints relating to odour emissions from the existing pumping station on the proposed WwTW site.

3.8. Traffic

3.8.1. Traffic on the highway varies considerably throughout the year with traffic likely to be higher in the summer months due to visitors to the area.

3.9. Noise

3.9.1. There are very few noise generation sources in the area; the background noise levels are given in Section 4.9.

3.10. Planning Policies

3.10.1. We refer to the following policy and regulatory guidelines in support of this application. The extant development plan which covers the application site comprises:

- Gwynedd Structure Plan, 1991
- Dwyfor Local Plan, 1998

3.10.2. Gwynedd Council is currently progressing the emerging Gwynedd Unitary Development Plan 2001 – 2016. A deposit Draft was published in June 2004. Currently, this carries little weight as it is in its formative stages.

3.10.3. The proposed WwTW lies outside, yet adjacent to, the Morfa Bychan settlement boundary. The site for the proposed WwTW lies within a designated Landscape Conservation Area.

Gwynedd Structure Plan

3.10.4. Strategic Policy 4 states that:

“In considering development proposals, to have regard to the need to both protect and enhance the marine, coastal, terrestrial and atmospheric environments of the County.”

3.10.5. Policy D3 of ‘The Environment’ Chapter states:

“Local Planning Authorities will establish Landscape Conservation Areas in order to conserve their attributes and they will have particular regard to the special character of each locality when considering proposals for development. In order to minimise its

impact, development will only be permitted if is capable of being satisfactorily integrated into the landscape.”

3.10.6. Policy D19 states:

“The County Council urges the National Rivers Authority, Welsh Water and other appropriate bodies to ensure that adequate and safe sewage disposal facilities are available, so that raw sewage does not pollute the County’s coastline and that all other forms of water and marine pollution are brought within international standards.”

3.10.7. Supplementary Policy 7 states:

“The County Council urge Welsh Water to accelerate their programme of improvements for sewage treatment and other facilities, so as to remove any current constraints to development in those areas of the County notified by NRA.”

3.10.8. Regarding the control of pollution, Policy D20 states:

“There will be a presumption against development which will:

- Discharge effluent in a manner which is likely to impair the quality of coastal, river, inland or ground water;*
- Increase levels of air or odour pollution;*
- Introduce major noise or vibration nuisance;*
- Overload the sewer network beyond acceptable levels;*
- Overload any existing sewage disposal facility beyond acceptable levels”*

Dwyfor Local Plan

3.10.9. Conservation and Environment Policy E3 – “Landscape Conservation Area”, states:

“In the Landscape Conservation Area, as shown on the proposals map, conservation of the landscape will be one of the main planning considerations. Any proposal that

will have an unacceptable adverse effect on the character and appearance of this landscape will not be approved.”

3.10.10. The justification for Policy E3 states that Landscape Conservation Areas are not as important as Designated Areas of Outstanding Natural Beauty, though in such areas, new development is expected to be of high design standard.

3.10.11. *Policy F14 – “Sewerage and Sewage Disposal”* from the Transportation, Community Facilities and Services Chapter, states:

“Proposals for sewage treatment and sewage disposal works will be approved provided that the development will not adversely affect local and visual amenities and/or wildlife. Proposals that will place additional pressure on existing sewerage facilities, which generate, or would lead to, an unacceptable level of pollution will not be approved until such time as appropriate sewage treatment facilities are provided. Dwr Cymru/Welsh Water are urged to implement schemes to improve the existing facilities at Trefor, Nefyn, Abergeirch, Afonwen, Llanbedrog, Pwllheli and Porthmadog.

3.10.12. The justification for Policy F14 states that several existing sewerage systems are overloaded and unless additional infrastructure is provided, further demands on the systems may result in pollution of the environment.

4. ENVIRONMENTAL EFFECTS

Coverage:	4.1	Scoping
	4.2	Water Quality
	4.3	Odours
	4.4	Visual Impact
	4.5	Nature Conservation
	4.6	Recreation
	4.7	Noise
	4.8	Traffic
	4.9	Drainage
	4.10	Cultural Heritage
	4.11	Planning Policy

4.1. Scoping

4.1.1. A formal scoping opinion was sought from Gwynedd Council regarding the possible environmental effects of the proposed development.

4.1.2. In accordance with their response, dated 17 January 2005, the Environmental Impact Assessment covered the following:

- Ecology
- Archaeology
- Visual Impact
- Odour
- Noise
- Land Uses
- Tourism and Recreation
- Policies and Plans

4.1.3. We have also assessed, for completeness, water quality/drainage and traffic issues.

4.2. Landscape

4.2.1. Appendix A shows each identified receptor, the predicted magnitude of change, the sensitivity of that receptor and the likely visual impact.

4.2.2. Twenty-five receptors were identified, as shown on Figure 5. Of these, twenty-two sites were either 'No Change' or 'Slight'. The remaining three sites were identified to be 'Slight/Moderate'.

4.2.3. The retention of existing gorse/scrub in the proposed 1.5 metre high bund and proposed additional planting would restrict views of the proposed development and therefore limit the visual impact in most cases to 'no change' or 'slight'.

4.2.4. The areas that will experience a 'slight/moderate' visual impact are:

- Nine residential properties to the east of the site
- Four residential properties to the north of the site ('Sandyway', 'Tossa de Mar', 'Degania' and 'Dilan')
- Tyddyn Adi and a detached property to the north of the site, north of Ffordd Morfa Bychan.

4.2.5. The nine properties to the east of the site are let by the Greenacres Caravan Park and would view the proposal from the far side of the boat storage area. The views of the proposed development will be obscured by bunding and proposed planting. The view of the development is currently framed by caravans and caravan park fencing. The visual impact would be greater at first floor level.

4.2.6. Views of the site from the four properties to the north of the site are currently framed by current caravan park development including a rope park, indoor swimming pool and caravans. The views of the proposed scheme would be restricted due to the retention of existing vegetation, proposed bunding and proposed planting. The visual impact of the development is greater at a first floor level though these views are obscured for 'Sandyway' and 'Dilan' as they have roof lights in the rear elevation at the first floor level.

4.2.7. The visual impact for Degania is also further reduced as the curtilage building to the rear of Dilan obstructs views of the site.

4.2.8. Views of the site from 'Tyddyn Adi' and the detached property to the north of Ffordd Bychan are currently framed by existing development at the caravan park. The view of the proposed

scheme at a ground floor level would be restricted by the retention of existing vegetation, the proposed bund and proposed landscaping. There will be a greater view of the site from the first floor level.

- 4.2.9. Therefore the development will minimise visual impact on surrounding receptors. The visual impact is considered to be an alteration of view as opposed to an overbearing visual impact.

4.3. **Nature Conservation**

- 4.3.1. The development would result in the reduction of land, which offers habitat potential for reptiles, including common lizard, slow worm and adder. This impact would be offset by the retention of the gorse/scrub to the north of the site and the proposed planting/bunding, which will surround the site.

- 4.3.2. The retention of as much vegetation as possible and the proposed bunding and planting would also help retain features that offer potential bird breeding habitats.

- 4.3.3. It is unlikely that the Scheme would impact on any other protected species. The Scheme would not affect any foraging areas in the adjacent ditch/watercourse.

- 4.3.4. This development has minimal conservation issues and provides opportunity for continued conservation development both within the existing site and adjacent areas.

4.4. **Water Quality and Drainage**

- 4.4.1. The proposed WwTW, in operation, will substantially improve the quality of the treated effluent discharged into Tremadog Bay. The presence of faecal coliforms is likely to decrease significantly following the introduction of appropriate treatment of sewage arisings.

- 4.4.2. Part of the proposed works will fall within the 1 in 100 year flood plain.

- 4.4.3. The proposed bund and topography has been designed to allow floodwaters to recede and all electronic and water sensitive equipment shall be located above existing flood levels.

4.5. **Cultural Heritage**

- 4.5.1. The development of the proposed WwTW will not impact on any known sites of archaeological interest.

4.5.2. The development of the proposed WwTW will not affect the setting of any nearby known sites of archaeological interest.

4.6. Recreation

4.6.1. The development of this site will support the sustained growth in tourist and recreation activities in and around Morfa Bychan.

4.6.2. The development will provide a more suitable access to the boat storage yard. The current access to the Boat Park is located between the two blocks of terraced housing to the east of the site.

4.6.3. The improvement to the quality of the wastewater discharge from this proposed development will enhance quality of coastal water. This will help to attract more visitors to the beach and provide associated economic benefits.

4.6.4. The attraction of visitors to the area would also increase expenditure to an area that is heavily reliant on income from tourism. A clean beach is fundamental to the on-going success of the Morfa Bychan tourist industry.

4.6.5. The continuing attraction of tourists is fundamental to the retention of Morfa Bychan as a viable and sustainable community and this development supports sustainable growth in tourism and recreation.

4.7. Odours

4.7.1. Within the proposed development three processes have been identified as possible generators of odour, albeit at low volume and concentration. These are:

Table 2: Summary of Odour Emission Estimates

Source	Ou _E /s	Ou/m ² /s	Comment
Activated Sludge Plant	568	8	Based on actual measured data from Llanasa WwTW
Storm Tank	176	2.5	Average value, assumes tank full for 90 days a year at emission rate of 10ou/m2/s
Final Settlement Tank	236	1.5	Based on actual measured data from Llanasa WwTW
Total	980		

4.7.2. Odour control measures have been incorporated into the final proposed scheme in order to reduce odour emissions.

4.7.3. The odour control unit will extract and treat odours from the following plant:

- Drum Thickener
- Sludge Holding Tank
- SAS Buffer Tank
- Tanker Connection
- Inlet Works
- RAS/SAS Chamber
- Inlet Pumping Station
- Liquor Return Pumping Station

4.7.4. Odorous air from these plant parts will be collected and treated through the odour control unit. This air is then transferred to the aeration lane for final 'polishing' prior to abstraction into the atmosphere.

4.7.5. The expected low level of odour emissions is identified at Figure 7.

4.7.6. The 10 odour unit contour is tightly contained within the operational land and confined between the Final Settlement Tanks and the Aeration Tank. This level of odour emission would usually only be detected by workers who gain access to the site.

4.7.7. Almost all of the five odour unit isopleth is contained within the operational land. The isopleth extends beyond the boundary at two locations by a few metres. The five odour unit contour would not encroach into the curtilage of any dwellings and is confined, beyond the operational land, to the proposed access road into the boat storage area and the scrub land between the operational land and Greenacres Holiday Park.

4.7.8. Therefore the five odour isopleth would not extend to any of the nearby sensitive receptors and therefore it is highly unlikely that the proposed WWTW would cause an odour nuisance to local residents as the development incorporates sufficient measures to contain odour within the operational land.

4.8. **Traffic**

4.8.1. The capacity of the local highway network is considered adequate to accommodate the level of construction and operational traffic.

- 4.8.2. All construction and operational traffic would enter the site from the east.
- 4.8.3. The amount of operational traffic generated by the proposed development is likely to be one to two tankers per month and approximately 3 or 4 visits by operation personnel per week.
- 4.8.4. The low level of traffic generated is unlikely to cause highway problems.

4.9. **Noise**

- 4.9.1. The existing noise measurements taken in December 2004 are shown in Table 3 from a point shown on Figure 8.

Table 3 : Background Noise Levels

Start time	L _{Aeq}	L _{A90}
16:30	41	34
17:30	40	34
18:30	42	34
19:30	37	33
20:30	38	35
21:30	40	36
Mean	40	34
22:30	38	34
23:30	35	34
00:30	36	34
Mean	37	34

The above data can be used as background noise levels when considering the contribution from the proposed development.

- 4.9.2. The main source of background noise was found to be vehicular traffic using Ffordd Morfa Bychan.
- 4.9.3. It is therefore considered that background noise levels would be higher during the summer months when the area has a significant influx of visitors.
- 4.9.4. Table 4 details manufacturers noise levels for the plant and machinery proposed in this development.

Table 4 : Noise levels of Proposed Plant and Machinery

Noise Source Description	Source Level dB(A)	Distance from the Source	Frequency of Operation	Duration
Generator	80	1	In event of loss of power	Less than 1 hour
Odour Control Plant	70	1	Constant	
Drum Thickener	56	1	Daily	Less than 6 hours
Inlet Works	70	1	Intermittent	Less than 10 minutes

4.9.5. These figures relate to dB(A) levels one metre from the noise source. These noise levels reduce as distance increases (Distance Correction) from the noise source and are further reduced by other factors including ground absorption, fencing, bunding, planting and meteorological conditions (Shielding Correction).

4.9.6. Table 5 shows the received predicted noise at the nearest noise sensitive receptors.

Table 5: Predicted Noise Level at Nearest Source

Daytime		Night-time	
Total Specific Noise, LAeq, 1Hr	77	Total Specific Noise, LAeq, 1Hr	77
Distance Correction (Ks)	-35	Distance Correction (Ks)	-35
Shielding correction	-5	Shielding correction	-5
Received Predicted Level	37	Received Predicted Level	37

4.9.7. The received predicted level would result in an increase of 3 dB(A) over the mean background noise measurement of 34 dB(A).

4.9.8. In accordance with advice contained in BS4142:1997, an increase of 10 dB(A) or more above background is likely to cause complaints. An increase of between 5 dB(A) and 10 dB(A) is considered to be of marginal significance. This increase of 3 dB(A) is, therefore, below the threshold of marginal significance.

4.9.9. World Health Organisation recommendations for night-time noise level should not normally exceed 45 dB(A) in receptors. To this end, the impact of the proposed WwTW falls below this level.

- 4.9.10. Procedures contained in BS5228 were used to determine likely construction noise levels at residential locations.
- 4.9.11. In setting noise guidelines for construction activities, it is common to set an absolute level of 75 dB(A).
- 4.9.12. Noise levels will not be significantly increased as a result of the implementation of the development.
- 4.10. **Planning Policy**
- 4.10.1. The proposal accords with the general thrust of Structure Plan Policy. The proposal would result in treated, rather than raw, effluent being discharged into Tremadog Bay. Therefore, the proposal accords with, and supports the provisions of Strategic Policy 4, which affords protection to marine and coastal environments.
- 4.10.2. A robust and comprehensive landscaping scheme would ensure that the proposed WwTW would not impact on the Designated Landscape Conservation Area.
- 4.10.3. The proposed WwTW fully accords and supports the provision of Policy D19, which encourages the implementation of adequate and safe sewage disposal facilities, so that raw sewage does not pollute the coastline.
- 4.10.4. The proposed WwTW would achieve the aims of, and accord with, Policy D20 with regard to control of pollution. The proposed WwTW would result in an improvement in the quality of discharge effluent into coastal waters, odour pollution would be retained within operational land, would not introduce major noise or vibration nuisances and improve sewerage capacity.
- 4.10.5. With regard to the impact on relevant policies from the Dwyfor Local Plan, Policy E3 relates to the Designated Landscape Conservation Area. The proposed WwTW would incorporate a robust, integrated landscaping scheme, would ensure that the character and appearance of the Landscape Conservation Area would not be adversely affected.
- 4.10.6. Policy F14 specifically relates to proposed sewage treatment works. The proposed WwTW would fully accord with this policy, as the scheme would not adversely affect local and visual amenity or wildlife.

5. MITIGATION MEASURES

Coverage:	5.1	Mitigation and Scheme Development
	5.2	Landscape
	5.3	Ecology
	5.4	Water Quality and Drainage
	5.5	Cultural Heritage
	5.6	Recreation and Tourism
	5.7	Odours
	5.8	Traffic
	5.9	Construction
	5.10	Noise

5.1. Mitigation and Scheme Development

5.1.1. As the design of the proposed WWTW has been developed it has been progressively refined and mitigation measures incorporated to help offset potential adverse impacts.

5.1.2. The additional measures outlined below are suggested to further ameliorate potential adverse environmental effects, which may arise as a result of the development of this scheme.

5.2. Landscape

5.2.1. Native plant should be used in the landscaping of the site.

5.2.2. The proposed bunding should be constructed using excavated material from the site.

5.3. Ecology

5.3.1. The gorse/scrub removal should take place outside of the bird breeding season.

5.3.2. The gorse would be initially coppiced in the presence of a suitably qualified ecologist, to ensure that any birds, badgers or reptiles, which may not have been previously identified, are not unduly disturbed.

5.4. Water Quality and Drainage

- 5.4.1. The scheme shall ensure that all surface water from proposed hardstanding shall be intercepted, passed through the treatment works and discharged via the long sea outfall.
- 5.4.2. The finished levels of the site shall ensure that any flood waters drain into the existing drainage ditch to the west of the site.
- 5.4.3. The proposed earth bunding shall be constructed so that it would not restrict flow to the existing drainage ditch.
- 5.4.4. All electric panels and instrumentation within the sludge thickening building shall be constructed on plinths so they are raised above 1 in 100 year flood levels.
- 5.4.5. The access roads will be graded at an appropriate crossfall to encourage any surface water towards the existing drainage ditch if not intercepted.

5.5. Cultural Heritage

- 5.5.1. As no features of archaeological interest are present on site no further mitigation measures are required.

5.6. Recreation and Tourism

- 5.6.1. No further mitigation measures are required.

5.7. Odours

- 5.7.1. The discernible 5 odour unit contour has been shown not to encroach to any sensitive receptors and therefore no further mitigation measures are required.

5.8. Traffic

- 5.8.1. All the construction and operational traffic shall be advised to enter Morfa Bychan from the east.

5.9. **Construction**

- 5.9.1. During construction, noise levels should be reduced as far as is reasonably practicable. This can be achieved by equipment selection and clauses within construction contracts.
- 5.9.2. To reduce the release of dust from any excavated material, stockpiling should be sheeted or regularly dampened, particularly during periods of dry weather.
- 5.9.3. It may be necessary to operate road sweepers along the local road network.

6.0 **Noise**

- 6.1 An acoustic fence a 1500 mm in height would be erected along the northern edge of the proposed access road. It is not considered that the noise of vehicles using the road would cause an unacceptable nuisance but it was considered that such noise should be reduced as much as possible so that the amenity of properties such as Dilan and Deganwy would remain unaffected.